Department of Industry and Resources

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 1131/1

Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **Apache Northwest Pty Ltd**

1.3. Property details

Property: Petroleum Production Licences: TL/1, TL/5, TL/6, TL/8, TL/9; Petroleum Exploration Permits: EP 307, EP 358, TP/8, WA-334-P; Retention Leases: TR/1, TR/2.

Local Government Area: Shire of Ashburton (Islands); Shire of Roebourne.

Colloquial name:

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
6.5		Mechanical Removal	Offshore Petroleum Exploration

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description

The application areas are dominated by two major marine habitat types: macroalgae dominated limestone reef, and subtidal reef platform/sand mosaic (CALM, 2004). Other habitat types include high energy coral reefs, sheltered lagoons, sparse seagrass meadows, channels, intertidal areas, shallow limestone platforms, barrier and fringing coral reefs and rocky intertidal shorelines (CALM, 2004).

The marine vegetation occurring within the application areas is typically dominated by species of brown algae, particularly of the genera *Sargassum*, *Turbinaria* and *Pandina*, while green algae from the genera *Caulerpa* and *Cladophora* are also quite common.

Six species of seagrass have been recorded within the application areas: *Cymodocea angustata*, *Halophila ovalis*, *Halophila spinulosa*, *Halodule uninervis*, *Thalassia hemprichii* and *Syringodium isoetifolium* (CALM, 2004).

Clearing Description

Apache Northwest Pty Ltd (Apache) have applied to clear up to 6.5 hectares of marine vegetation within a total application area of approximately 67,450 ha, for the purposes of offshore petroleum exploration activities, petroleum appraisal and production drilling, and associated activities.

There are three application areas, located respectively: immediately to the northwest and west of the Montebello Islands; between the Montebello Islands and Barrow Island; and approximately 7km to the southwest of Barrow Island.

Disturbance to marine vegetation will result from anchoring of support vessels, positioning and removal of drill legs and physical smothering of vegetation from drill cuttings. The clearing will be limited to less than 1.3 ha in any one year, throughout the duration of the clearing permit (Apache, 2006).

Vegetation Condition

Pristine: No obvious signs of disturbance (Keighery, 1994).

To

Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994).

Comment

The geomorphology, sediment quality and water quality within the application area and surrounding region are generally in an undisturbed condition, apart from some localised disturbance for pipelines and shipping channels (CALM, 2004).

The application area ranges from approximately 20 km to approximately 90 km off the Pilbara coastline, in the vicinity of the Barrow, Lowendal and Montebello Islands.

Please note: Although the permit application areas encompass some landforms, including the Lowendal Islands, the clearing authorised under this Permit is for marine vegetation only.

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 majority of the clearing application area lies within either the Montebello Islands Marine Park or the Barrow Island Marine Management Area (Apache, 2006; GIS database). The application area also partly overlaps two areas listed on the Register of the National Estate: the Montebello Islands Marine Area and the Barrow Island Marine Area (Apache, 2006; DEH 2006; GIS Database).

The marine and coastal environment of the Barrow-Lowendal-Montebello Islands region consists of a unique combination of offshore islands, intertidal and subtidal coral reefs, mangroves, macroalgal communities and sheltered lagoons. The region was identified by the Marine Parks and Reserves Selection Working Group (MPRSWG) as a distinct coastal type with extremely significant conservation and biodiversity values (CALM, 1994). The waters surrounding the island groups are dominated by two major marine habitat types, these being macroalgae dominated limestone reef, and subtidal reef platform/sand mosaic. Due to the range of substrate types and oceanographic conditions, the structural variety of the system creates exceptional habitat diversity with high species richness (CALM, 2004; DEH, 2006). The species inhabiting the area are mainly tropical. Some are locally endemic, but the majority are generally widespread throughout much of the Indo-West Pacific region (CALM, 2004; DEH, 2006).

The region contains a high diversity of corals, with at least 150 species of hard corals recorded to date. The coral reefs and marine environment of the Lowendal Islands and adjacent marine areas are of international importance. The area has significant wilderness quality and aesthetic importance due to the low level of disturbance (DEH, 2006). Coral bomboras are best developed in the shallow Lowendal shoal area, west/south-west of the Montebello Islands and west of Barrow Island (CALM, 2004). The Lowendal Islands, with the Montebello Islands and Barrow Island, provide an important ecological link for some species between the southern fringing reefs off North West Cape and the oceanic reefs of the north, such as the Rowley Shoals and Scott Reef (DEH, 2006).

Macroalgal assemblages (typically *Sargassum*) occur in up to 70% of the mapped marine habitat within the Barrow-Lowendal-Montebello Island complex (Apache, 2006). Macroalgal communities are ecologically important, as they provide crucial habitat for numerous fauna species such as invertebrates, juvenile fish and green turtles (Apache, 2006; DEH, 2006). Six seagrass species have been recorded within the Barrow-Lowendal-Montebello areas, mainly in areas of sandy seafloor ranging from intertidal to shallow sub-tidal zones, sparsely distributed between the macroalgae. Seagrasses form important feeding grounds for Green Turtles (*Chelonia mydas*) and Dugongs (*Dugong dugon*), and are important nursery grounds for many fish and crustacean species (Apache 2006; CALM, 2006; DEH, 2006).

As the application area includes some areas which are recognised as containing a high level of biodiversity, the proposed clearing may be at variance to this principle. The Department of Environment and Conservation (DEC) have advised that the genus *Sargassum* is the dominant marine vegetation, most likely to be impacted by the proposed clearing (DEC, 2006a). The macroalgal habitat is ecologically important, however this habitat is naturally spatially and temporally variable, and fauna species are adapted to follow the shifting resource. The proposed clearing of up to a total of 6.5 ha, spread over a five year period, in small areas scattered over a total application area of approximately 67,450 ha, is unlikely to have any significant or lasting impact on the biodiversity of the region (DEC, 2006a). DEC considers that the potential environmental impacts of the proposed clearing can be adequately managed under the Environmental Management Plan for the project, which has been developed in consultation with DEC (DEC, 2006a).

Methodology

Apache (2006).
CALM (1994).
DEC (2006a).
DEH (2006).
GIS Database:
- CALM Managed Lands and Waters - CALM 1/07/05.
- Register of National Estate - EA 28/01/03.

(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

The waters surrounding the Barrow-Lowendal-Montebello islands contain a diverse mix of habitats which support a rich diversity of marine fauna. The application areas are dominated by two major marine habitat types; macroalgae dominated limestone reef, and subtidal reef platform/sand mosaic (Apache, 2006; CALM, 2004). Other habitat types include extensive high energy coral reefs, sheltered lagoons, channels, intertidal areas, shallow limestone platforms, barrier and fringing coral reefs and rocky intertidal shorelines (CALM, 2004).

The vegetation within the application area is typically dominated by species of brown algae, particularly of the genera *Sargassum*, *Turbinaria* and *Pandina*, while green algae from the genera *Caulerpa* and *Cladophora* are also quite common. Macroalgae are important benthic primary producers and the dense cover provides important habitat for a diverse array of fauna including molluscs, sea stars, sea urchins and fish (CALM, 2004). Macroalgal meadows occupy approximately 40% (approximately 86,920 ha) of the Barrow - Lowendal - Montebello marine conservation areas (CALM, 2004). Substantial undisturbed macroalgal meadows remain in the waters surrounding the Barrow - Lowendal - Montebello Islands, and the impact of the proposed clearing on the macroalgal communities in a regional context is likely to be negligible.

Seagrass meadows are sparsely interspersed between the macroalgae and are generally restricted to shallow waters no deeper than five metres (Apache, 2006; CALM, 2004). Six species of seagrass have been recorded within the application area. The seagrass meadows are likely to be the preferred food source for Dugongs (*Dugong dugon*), a species of conservation significance listed under *Schedule 4 - Other specially protected fauna*, in the *Wildlife Conservation (Specially Protected Fauna) Notice 2006(b)*, and protected under the *Wildlife Conservation Act 1950.* Dugongs can be found in the shallow, warm waters in the vicinity of the Montebello Islands, Lowendal Islands and Barrow Shoals (CALM, 2004). The clearing permit application includes some shallow areas, especially around the Lowendal Islands (GIS database), and as a result several seagrass meadows may be impacted by the proposed clearing activities. However, the sparse nature of the proposed clearing is unlikely to have any significant impact on Dugong habitat.

Coral reefs occur throughout the Barrow - Lowendal - Montebello Islands region, in areas of relatively shallow water and strong currents where water movements constantly transport nutrients and food supplies (Apache, 2006). These shallow intertidal and subtidal reef communities extend over approximately 12,588 ha (CALM, 2004). Corals provide important habitat for a variety of marine life including many invertebrates and fish (CALM, 2004). The clearing permit application area may impact on some areas of coral reef. However the area of potential impact on the reef represents less than 0.06% of the coral reef communities, and the impact of the proposed clearing is insignificant at the regional level. Under the conditions imposed on this clearing permit, the proponent is required to conduct inspections to identify the location of coral bomboras and avoid contact with them. The proposed inspection and avoidance measures will be described by the proponent in their Environmental Management Plan (EMP), which must be approved by DoIR, prior to commencement of the exploration drilling programme.

Benthic infauna (the aquatic animals that inhabit marine or fresh water sediments) have been surveyed at several sites within and adjacent to Apache's Commonwealth water permits. The marine sediments have been found to support a diverse array of benthic infauna, consisting predominately of mobile burrowing species which include molluscs, crustaceans (crabs, shrimps and smaller related species), polychaetes, sipunculid and platyhelminth worms, asteroids, echinoids and other small animals (Apache, 2006). Apache commissioned a monitoring study of infaunal assemblages associated with petroleum facilities around Varanus and Airlie Islands. The infauna abundances observed within 50 metres of the petroleum facilities were generally within the natural variability observed among control sites. The study concluded that, on a regional scale, natural processes rather than effects of petroleum production activities influenced infaunal assemblages (Apache, 2006). Furthermore, in areas around the facilities, no differences in marine sediment quality were detected that would be likely to result in an ecological impact (Apache, 2006). The proposed clearing activities are unlikely to have any significant impact on benthic infauna communities at a local or regional level.

Five species of marine turtle listed in *Schedule 1 - Fauna that is rare or is likely to become extinct*, of the *Wildlife Conservation (Specially Protected Fauna) Notice 2006(b)*, have been recorded in the Barrow - Lowendal -Montebello Islands area, and the islands' beaches are recognised as important turtle nesting sites. These species: the Green Turtle, *Chelonia mydas*; Flatback Turtle, *Natator depressus*; Hawksbill turtle, *Eretmochelys imbricata*; Loggerhead turtle, *Caretta caretta*; and the Leatherback Turtle, *Dermochelys coriacia*, are also listed under the *Environment Protection and Biodiversity Conservation Act, 1999*. However all of these species have relatively wide distributions across northern Australia (DEH, 2006), and the proposed clearing is likely to cause only minimal disturbance to turtle feeding grounds. The proposed clearing of marine vegetation will not impact on any onshore turtle nesting sites.

The proposed clearing activities may disturb macroalgal, seagrass and/or coral communities which are important habitat for marine fauna species. However the Department of Environment and Conservation (DEC) has advised that the nature and extent of the proposed clearing is unlikely to have any significant impact on the fauna habitats of the region, and that any potential impacts on fauna habitats can be adequately managed under the Environmental Management Plan for the project (DEC, 2006a).

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

Methodology

Apache (2006).
CALM (2004).
DEC (2006a).
DEH (2006).

(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

Apache has undertaken a search of the Department of Environment and Heritage's Environment Protection and Biodiversity Conservation databases. No rare or endangered marine flora species are known to occur within the application areas (Apache, 2006; GIS database).

The Department of Environment and Conservation (DEC) advises that no flora species of conservation significance are likely to be impacted by the proposed clearing activities (DEC, 2006a).

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

Methodology

Apache (2006).
DEC (2006a).
GIS Database: Declared Rare and Priority Flora List - CALM 01/07/05

(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 Threatened Ecological Communities (TEC's) in the vicinity of the clearing application areas (Apache, 2006; DEC, 2006a; GIS database).

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

Methodology

Apache (2006)
DEC (2006a).
GIS Database: Threatened Ecological Communities - CALM 12/4/05

(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

At present there are no known references available for estimating the current and pre-European extent of marine vegetation in this region. Macroalgae, seagrass and coral communities are extensive throughout the Barrow - Lowendal - Montebello Islands area, and remain largely intact except for localised areas of disturbance surrounding petroleum drilling platforms, pipelines and associated activities (Apache, 2006; CALM, 2004).

The marine vegetation of the region has not been extensively cleared, and the small pockets of vegetation proposed to be cleared do not represent significant remnants of native vegetation.

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

Methodology

Apache (2006).
CALM (2004).

(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 at variance to this Principle

The *Environmental Protection Act 1986* defines a wetland as an area of seasonally, intermittently or permanently waterlogged or inundated land, whether natural or otherwise, and includes a lake, swamp, marsh, spring, dampland, tidal flat or estuary. As the proposed offshore clearing area occurs in marine rather than terrestrial habitat, this clearing principle is not considered applicable to the assessment of the proposal.

Based on the above, the proposed clearing is not at variance to this principle.

Methodology

(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

As the proposed clearing areas are located entirely within a marine environment, the threat of degradation will be restricted to that caused by anchoring of vessels, positioning of drilling rig legs and physical smothering of vegetation by drill cuttings (waste soil and rock discarded during drilling operations) (Apache, 2006).

The anchoring of support vessels has the potential to crush and up-root macroalgae, seagrass and coral communities. Apache have developed several management strategies for the anchoring of vessels, aimed at minimising potential impacts on sensitive marine habitats. These management strategies include: controlling the actual placement of all anchor positions; using polypropylene ropes or soft lines connected directly to the anchor (which will avoid dragging and minimise scouring of the seabed); and buoying the barge's anchor wires with floatation buoys (Apache, 2006).

Positioning and removal of drilling rig legs has the potential to create shallow furrows especially in sandy substrates, and once in position the rig legs can crush or smother vegetation. The drilling rig legs may create depressions in the substrate, which can take several years to refill and recolonise (Apache, 2006).

Drill cuttings can physically smother vegetation. Apache have advised that if a well is located within the Barrow Island Marine Management Area or the Montebello Islands Marine Park, in water less than 15 metres deep or within 2 kilometres of land or sensitive seabed features, cuttings re-injection down the drill hole will be attempted as standard practice (Apache, 2006).

Other forms of land based degradation such as water logging, salinisation and erosion are not applicable to the assessment of the proposal as the application area is entirely located within a marine (aquatic) environment.

Although some localised land (sea-bed) degradation may occur, the overall impact of the proposed clearing is likely to be minimal. Apache is committed to adhering to management strategies in order to minimise the impact of the proposed activities on the marine environment.

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

Methodology Apache (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

The application is to clear up to 6.5 ha of marine vegetation, within a total application area of approximately 67,450 ha. The majority of the application area falls within either the Multiple Use Area of the Barrow Island Marine Management Area or within the General Use Zone of the Montebello Islands Marine Park. Petroleum exploration and development activities are permitted within these areas, subject to assessment by the relevant Government agencies in accordance with the *Environmental Protection Act 1986* (CALM, 2004; GIS Database).

The clearing permit application includes three separate application areas, totalling approximately 67,450 ha. The southern application area is located approximately 7 km southwest of Barrow Island (at its nearest point). This application area covers approximately 10,800ha, and falls wholly within the Multiple Use Zone of the Barrow Island Marine Management Area (CALM, 2004; GIS Database).

The middle application area (of approximately 43,000 ha) is located between Barrow Island and the Montebello Islands, extending northwards on the eastern side of the Montebellos, and extending southwards on the western side of Barrow Island. Approximately 74% or approx. 31,800 ha of this area falls within the Multiple Use Zone of the Marine Management Area. A further 18% (approx. 7,600 ha) of this application area falls outside of any conservation zoning, while the northern tip (approx. 8% or 3,600 ha) falls within the General Use Zone of the Montebello Islands Marine Park (CALM, 2004; GIS Database).

The northern application area is located on the western side of the Montebello Islands and covers an area of approximately 13,650 ha, all of which is located within the General Use Zone of the Montebello Islands Marine Park (CALM, 2004; GIS Database).

The Montebello Islands Marine Park is an A Class Marine Park which covers an area of approximately 57,000 ha, and is managed for the purposes of conservation, by the Department of Environment and Conservation (DEC). The Marine Park has been divided into several zones within which various restrictions apply. These zones include: Sanctuary Zone, Recreation Zone, Special Purpose Zone (benthic protection), Special Purpose Zone (pearling) and General Use Zones. The clearing permit application areas overlap approximately 21,250 ha of the General Use Zone of the Marine Park (CALM, 2004; GIS Database).

The Barrow Island Marine Management Area is an A Class Marine Management Area, covering an area of approximately 114,400 ha, which is managed by DEC to protect the conservation values of the area, while allowing for sustainable commercial and recreational activities (CALM, 2004). The majority of the Marine

Management Area is zoned as Multiple Use, with a small area within Bandicoot Bay on the southwestern coast of Barrow Island, zoned as a Conservation Area for the protection of benthic fauna and seabirds. The clearing permit application areas are located only within the Multiple Use Zone of the Marine Management Area (GIS database).

The edges of the three clearing permit application areas also slightly overlap the Montebello Islands Marine Area, and the Barrow Island Marine Area, both of which are registered for their natural values on the Register of the National Estate (DEH, 2006). These registered areas fall almost entirely within the boundaries of the abovementioned Marine Park and Marine Management Area.

As the proposed clearing will occur within conservation areas, the proposal may be at variance to this principle. However, the proposed clearing of up to 6.5 ha of marine vegetation, sparsely scattered over a very broad area, will result in the disturbance of less than 0.0038% of the combined area of the Montebello Islands Marine Park and the Barrow Island Marine Management Area. The Department of Environment and Conservation advises that the impact of the proposed clearing on the environmental values of these conservation areas is likely to be minimal (DEC, 2006a).

Methodology Apache (2006)
CALM (2004).
DEC (2006a).
GIS Database:
- CALM Managed Lands and Waters - CALM 1/07/05.
- 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 is not likely to be at variance to this Principle

The proposed offshore clearing is located on the sea bed which is naturally inundated and subject to some disturbance during cyclones. In addition, the vegetation in the proposed clearing areas comprises macroalgal beds which naturally undergo large seasonal biomass fluctuations (CALM, 2004). Given the relatively small area of clearing proposed (6.5ha), within an application area of approximately 67,450 hectares, the proposal is not likely to cause deterioration in the quality of the sea water in which it occurs.

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

Methodology CALM (2004).

(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 at variance to this Principle

The proposed offshore clearing of 6.5 hectares occurs in a naturally flooded marine habitat, therefore, this principle is not considered applicable to the assessment of the proposal.

Based on the above, the proposed clearing is not at variance to this principle.

Methodology

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

Comments

There are no native title claims registered over the application areas (GIS Database).

There are no known Sites of Aboriginal Significance within the application areas (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Sites of Aboriginal Significance are damaged through the clearing process.

A water licence will not be required for this project, as *The Rights in Water and Irrigation Act 1914* has no jurisdiction in offshore areas (DoW, 2006).

Offshore petroleum exploration is not a prescribed activity, therefore, the proposal does not require a licence or works approval (DEC, 2006b).

Methodology DEC (2006b).
DoW (2006).
GIS Database:
- Aboriginal Sites of Significance - DIA 04/07/02.
- Native Title Claims - DLI 19/12/04.

4. Assessor's recommendations

Purpose	Method	Applied area (ha)/ trees	Decision	Comment / recommendation
Petroleum Exploration - offshore	Mechanical Removal	6.5	**Grant**	The proposal has been assessed against the Clearing Principles. The proposed clearing may be at variance to the following Principles: (a) biodiversity; (h) conservation areas. However, due to the small area of the proposed disturbance (6.5 ha), spread over a five year period, and scattered over a very large application area (approximately 67,450 ha), the asssessing officer concludes that the environmental impacts of the proposed clearing are likely to be minimal, and that the potential environmental impacts can be adequately managed under the Environmental Management Plan for the project, which has been developed in consultation with the Department of Environment and Conservation (DEC). The assessing officer therefore recommends that the permit be granted, subject to the following conditions: 1. The Permit Holder shall record the following for each instance of clearing: a) the location where the clearing occurred, expressed as grid coordinates using the Geocentric Datum of Australia 1994 coordinate system; b) the estimated size of the area cleared in hectares or square metres; c) the method of clearing; d) the purpose of clearing, e) the dates on which the area was cleared. 2. The Permit Holder shall provide a report to the Director, Environment, Department of Industry and Resources by 9 May of each year, setting out the records required under Condition 1 of this permit in relation to clearing carried out between 1 January and 31 December of the previous year. 3. The Permit Holder shall ensure that prior to the movement and positioning of drilling equipment and supporting vessels throughout the offshore clearing area, appropriate inspections are undertaken, as outlined in the DOIR approved Environmental Management Plan: "*North West Shelf Drilling Programme 2007 to 2011. State and Commonwealth Waters. Environment Plan (EA-00-RI-164).*", to identify the location of coral bomboras so as to avoid impact on them and disturbance nearby.

5. References

Apache (2006) Offshore drilling operations and general petroleum support activities on the North West Shelf. Supporting Documentation for a Native Vegetation Clearing (Purpose) Permit, Apache Northwest Pty Ltd, Western Australia.

CALM (1994) A Representative Marine Reserve System for Western Australia. Report of the Marine Parks and Reserves Selection Working Group. Department of Conservation and Land Management, Perth, Western Australia.

CALM (2004) Indicative Management Plan for the proposed Montebello/Barrow Islands Marine Conservation Reserves 2004. Department of Conservation and Land Management, Perth, Western Australia.

DEC (2006a) Biodiversity advice for land clearing application. Advice to Assessing Officer, Native Vegetation Assessment Branch, Department of Industry and Resources (DoIR). Biodiversity Coordination Section, Department of Environment and Conservation, Western Australia.

DEC (2006b) Licence Advice. Advice to Assessing Officer, Native Vegetation Assessment Branch, Department of Industry and Resources (DoIR). Department of Environment and Conservation, Western Australia.

DEH (2006) Australian Heritage Database. Department of the Environment and Heritage, ACT.

DoW (2006) Water Allocation/Licence Advice. Advice to Assessing Officer, Native Vegetation Assessment Branch, Department of Industry and Resources (DoIR). Department of Environment and Conservation, Western Australia.

Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.

6. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government.
CALM	Department of Conservation and Land Management, Western Australia.
DAFWA	Department of Agriculture and Food, Western Australia.
DA	Department of Agriculture, Western Australia.
DEC	Department of Environment and Conservation
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DoE), Western Australia.
DIA	Department of Indigenous Affairs
DLI	Department of Land Information, Western Australia.
DoE	Department of Environment, Western Australia.
DoIR	Department of Industry and Resources, Western Australia.
DOLA	Department of Land Administration, Western Australia.
DoW	Department of Water
EP Act	Environment Protection Act 1986, Western Australia.
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
GIS	Geographical Information System.
IBRA	Interim Biogeographic Regionalisation for Australia.
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
RIWI	Rights in Water and Irrigation Act 1914, Western Australia.
s.17	Section 17 of the Environment Protection Act 1986, Western Australia.
TECs	Threatened Ecological Communities.

Definitions:

{Atkins, K (2005). *Declared rare and priority flora list for Western Australia, 22 February 2005*. Department of Conservation and Land Management, Como, Western Australia} :-

P1	**Priority One - Poorly Known taxa**: taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
P2	**Priority Two - Poorly Known taxa**: taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
P3	**Priority Three - Poorly Known taxa**: taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.
P4	**Priority Four – Rare taxa**: taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years.
R	**Declared Rare Flora – Extant taxa** *(= Threatened Flora = Endangered + Vulnerable)*: taxa which have been adequately searched for, and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.
X	**Declared Rare Flora - Presumed Extinct taxa**: taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

{Wildlife Conservation (Specially Protected Fauna) Notice 2005} [Wildlife Conservation Act 1950] :-

Schedule 1 **Schedule 1 – Fauna that is rare or likely to become extinct:** being fauna that is rare or likely to become extinct, are declared to be fauna that is need of special protection.

Schedule 2 **Schedule 2 – Fauna that is presumed to be extinct:** being fauna that is presumed to be extinct, are declared to be fauna that is need of special protection.

Schedule 3 **Schedule 3 – Birds protected under an international agreement:** being birds that are subject to an agreement between the governments of Australia and Japan relating to the protection of migratory birds and birds in danger of extinction, are declared to be fauna that is need of special protection.

Schedule 4 **Schedule 4 – Other specially protected fauna:** being fauna that is declared to be fauna that is in need of special protection, otherwise than for the reasons mentioned in Schedules 1, 2 or 3.

{CALM (2005). *Priority Codes for Fauna*. Department of Conservation and Land Management, Como, Western Australia} :-

P1 **Priority One: Taxa with few, poorly known populations on threatened lands**: Taxa which are known from few specimens or sight records from one or a few localities on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, active mineral leases. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.

P2 **Priority Two: Taxa with few, poorly known populations on conservation lands**: Taxa which are known from few specimens or sight records from one or a few localities on lands not under immediate threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.

P3 **Priority Three: Taxa with several, poorly known populations, some on conservation lands**: Taxa which are known from few specimens or sight records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.

P4 **Priority Four: Taxa in need of monitoring**: Taxa which are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.

P5 **Priority Five: Taxa in need of monitoring**: Taxa which are not considered threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

Categories of threatened species (*Environment Protection and Biodiversity Conservation Act 1999)*

EX **Extinct:** A native species for which there is no reasonable doubt that the last member of the species has died.

EX(W) **Extinct in the wild:** A native species which:
(a) is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or
(b) has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.

CR **Critically Endangered:** A native species which is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.

EN **Endangered:** A native species which:
(a) is not critically endangered; and
(b) is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.

VU **Vulnerable:** A native species which:
(a) is not critically endangered or endangered; and
(b) is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.

CD **Conservation Dependent:** A native species which is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.