

**Issues Paper**

**NORTHERN YILGARN (MT MANNING RANGE, MT ELVIRE AND  
JAURDI) CONSERVATION RESERVES MANAGEMENT PLAN**

**March 2008**

# MANAGEMENT PLAN FOR NORTHERN YILGARN (MT MANNING RANGE, MT ELVIRE AND JAURDI) CONSERVATION RESERVES

## ISSUES PAPER

### INTRODUCTION

This paper highlights the values and main management issues of the Northern Yilgarn (Mt Manning Range, Mt Elvire and Jaurdi) Conservation Reserves which will be known as the 'Northern Yilgarn Planning Area' and includes:

- Mt Manning Range Nature Reserve (36208);
- Mt Manning Range Conservation Park (48470);
- Helena and Aurora Range Conservation Park (48470);
- Proposed Jaurdi Conservation Park;
- Proposed Mt Elvire Conservation Park; and
- Proposed Die Hardy/Jackson/Windarling Range Reserves.

The issues paper aims to highlight the issues that the Conservation Commission of Western Australia (Conservation Commission) and the Department of Environment and Conservation (DEC) will need to consider during the planning process. It has also been prepared to inform and assist the public in participating in the management planning process.

It should be noted that the Department of Conservation and Land Management (CALM) and the Department of Environment were amalgamated on 1 July 2006 creating the Department of Environment and Conservation (DEC).

### Brief Overview

The Conservation Commission through the agency of DEC is currently preparing the first management plan for the existing and proposed conservation reserves for the Northern Yilgarn planning area identified in:

- (a) the Environmental Protection Authority's *Conservation Reserves of Western Australia System 11* (EPA 1975);
- (b) subsequent planning documents (eg. Goldfields Region – Regional Management Plan 1994 – 2004);
- (c) the 2015 pastoral lease exclusion for public purpose process (through this process DEC has identified areas within pastoral leases that would contribute towards a comprehensive, adequate and representative reserve system and provide for future sustainable tourism and recreational use).
- (d) The Environmental Protection Authority (EPA) '*Advice on areas of the highest conservation value in the proposed extensions to Mount Manning Nature Reserve*' Bulletin 1256 (2007), which provides advice to the Minister for the Environment under Section 16(e) of the *Environmental Protection Act 1986*;
- (e) The Department of Environment and Conservation (DEC) and Department of Industry and Resources (DoIR) '*Strategic Review of the Conservation and Resource Values of the Banded Iron Formation of the Yilgarn Craton*'(2007) and associated Cabinet Decision Sheet '*Strategic Approach to Balancing Conservation and Mining Interests in the Midwest and Goldfields Banded Ironstone Formation (BIF) Ranges*'. (2007)

## Regional Context

The Northern Yilgarn planning area is located 70–200 km north-east of Southern Cross. The planning area lies within the DEC Goldfields Region and falls within the Menzies, Yilgarn and Coolgardie Shires. The Northern Yilgarn planning area is almost completely surrounded by unallocated Crown land except for Mt Jackson and Diemals Pastoral Leases.

The Northern Yilgarn planning area is a favourite recreation destination for locals from both Southern Cross and Kalgoorlie-Boulder and is also popular with residents from Perth. The planning area provides opportunities for a range of recreation activities including camping, sightseeing, nature appreciation, fossicking and four-wheel driving.

There are a number of mining operations and extensive mining interests in the Banded Ironstone Formations that exist within and surrounding the Northern Yilgarn Planning Area. One active iron ore mine exists at Koolynobbing with current satellite mines at Windarling and Mt Jackson, one active gold mine exists within excluded lands surrounded by the Helena and Aurora Range Conservation Park.

## Management Plan Area and Land Tenure

The Northern Yilgarn planning area includes both existing and proposed conservation reserves (see Map 1) and covers an area of approximately 1,300,948ha. The existing reserves comprise:

- The Mt Manning Range Nature Reserve (No. 36208) (190 121ha) which was declared in September 1979 and is currently classified as an “other than A class” reserve;
- The Helena and Aurora Range Conservation Park (No. 48470) which was created in December 2005 (approximately 134 345ha) and is currently classified as an “other than A class” reserve; and
- The Mt Manning Range Conservation Park (No. 48470), which was excluded from the original Mt Manning Range Nature Reserve (No. 36208), was created as a conservation park in December 2005 (approximately 12 947ha) and is currently classified as an “other than A class” reserve.

The proposed conservation parks and reserves comprise:

- The former pastoral station of Jaurdi Station (approximately 289 776ha) purchased by CALM in July 1989;
- The former pastoral station of Mt Elvire (approximately 150 946ha) purchased by CALM in June 1991;
- Part of Mt Jackson pastoral lease (approximately 37 700ha) including Mt Jackson, Muddarning and Boondine and Yenyanning Hills as defined through the 2015 pastoral lease excision process;
- Part of Diemals pastoral lease (approximately 51 279ha) including the Die Hardy Range, Windarling and Yokradine Hills as defined through the 2015 pastoral lease excision process;
- Additional conservation reserves recommended in the EPA (2007) ‘*Advice on areas of the highest conservation value in the proposed extensions to Mount Manning Nature Reserve*’ Bulletin 1256 including:
  - A further south, west and northern extension to the Die Hardy, Jackson, Windarling and Helena and Aurora Ranges proposed reserves to include the full extent of the ranges and banded iron areas (approximately 66 735ha);
  - The southern end of the Koolyanobbing Range (approximately 2 605ha);

- Parts of Lake Seabrook adjoining the southern end of the Koolyanobbing Range and proposed Jaurdi Conservation Park and parts of Lake Barlee adjoining the proposed Mt Elvire Conservation Park (approximately 20 427ha and 209 508ha respectively);
- UCL south of the Helena and Aurora Range Conservation Park and west of the proposed Jaurdi Conservation park (approximately 134 559ha).

The management planning process will suggest appropriate names for the proposed conservation parks and reserves and submit these names for official recognition. For ease of use through this document the following names have been given to the recently created and proposed reserve additions:

- Helena and Aurora Range Conservation Park;
- Mt Manning Range Conservation Park;
- Proposed Jaurdi Conservation Park;
- Proposed Mt Elvire Conservation Park; and
- Proposed Die Hardy/Jackson/Windarling Ranges Reserves.

The Mt Manning Range Nature Reserve was gazetted as a C class reserve for the purpose of conserving flora and fauna in September 1979 and is vested in the Conservation Commission. The Mt Manning Range Nature Reserve does not include the Mt Manning Range as this was originally excluded from the nature reserve as it was a Mining Act Ministerial Temporary Reserve (1971H). This Mining Act Temporary Reserve subsequently expired, changing the tenure to unallocated Crown land. In December 2005 the Mt Manning Range Conservation Park was created. For ease of reference throughout this document, the Mt Manning Range Nature Reserve and Conservation Park will be referred to as the Mt Manning Range Conservation Reserves.

The former Jaurdi and Mt Elvire Stations were purchased in 1989 and 1991 respectively by the Department of Conservation and Land Management (CALM) as additions to the conservation reserve system. They were purchased using funding from the sandalwood industry to achieve sandalwood management plan objectives under the former Sandalwood Conservation and Regeneration Project (SCARP). They have now been included by DEC in the tenure and conservation reserve creation processes under the bigger Gascoyne Murchison Strategy (GMS). This Strategy saw the acquisition of whole and part pastoral leases for conservation purposes across the Gascoyne Murchison region.

The proposed Die Hardy/Jackson/Windarling Ranges Reserves is currently under pastoral lease and will become land managed by DEC either in 2015 as part of the 2015 Pastoral Lease Exclusion Process or possibly before 2015.

These additional conservation parks combined with the existing conservation reserves will ensure the conservation of restricted flora and poorly represented vegetation types, fauna habitats and landform units.

### ***Proposed Tenure Changes***

The proposed tenure for both existing and proposed reserves follows recent recommendations identified in:

- The EPA (2007) *'Advice on areas of the highest conservation value in the proposed extensions to Mount Manning Nature Reserve'* Bulletin 1256, which provides advice to the Minister for the Environment under Section 16(e) of the *Environmental Protection Act 1986*.
- The DEC and DoIR (2007) *'Strategic Review of the Conservation and Resource Values of the Banded Iron Formation of the Yilgarn Craton'* (2007)
- Cabinet Decision Sheet *'Strategic Approach to Balancing Conservation and Mining Interests in the Midwest and Goldfields Banded Ironstone Formation (BIF) Ranges'*.

The appropriate tenure, boundaries, purpose, classification and naming are issues to be addressed through processes that are currently underway and during the area management planning process.

**Table 1: Proposed Tenure Changes to Existing Reserves**

Reserve/ Tenure	Current Purpose	Current Vesting	Current Class	Area (ha)	Proposed Changes
Mt Manning Range Nature Reserve (No 36208)	Conservation of Flora and Fauna	Conservation Commission	Other than A class	190 121	'A Class' Nature Reserve or National Park
Helena and Aurora Range Conservation Park (No 48470)	Conservation of Flora and Fauna.	Conservation Commission	Other than A class	134 345	'A' Class Nature Reserve or National Park with the exception of Bungalbin East
Mt Manning Range Conservation Park (No. 48470)	Conservation of Flora and Fauna.	Conservation Commission	Other than A class	12 947	'A' Class Nature Reserve or National Park

**Table 2: Proposed Tenure for Additions and Proposed New Reserves**

Tenure	Proposed Purpose	Proposed Vesting	Proposed Class	Area (ha)	Proposed Changes
<b>UCL (Former pastoral lease)</b>					
Jaurdi Station purchased in July 1989	Conservation Park	Conservation Commission	Either class A or other than class A (unclassified)	289 776	None, still proposed as Conservation Park
Mt Elvire Station purchased in June 1991	Conservation Park	Conservation Commission	Either class A or other than class A (unclassified)	150 946	None, still proposed as Conservation Park
Part of Mt Jackson pastoral lease will be excised under 2015 pastoral exclusion process	Conservation of Flora and Fauna	Conservation Commission	'A' class	37 700	Nature Reserve or National Park
Part of Diemals pastoral lease will be excised under 2015 pastoral exclusion process	Conservation of Flora and Fauna	Conservation Commission	'A' class	51 279	Nature Reserve or National Park
<b>EPA advice additions</b>					
A further south, west and northern extension to the Die Hardy, Jackson, Windarling and Helena Aurora Ranges proposed reserve to include the full extent of the ranges and banded iron areas	Conservation of flora and fauna	Conservation Commission	'A' class	66 735	Nature Reserve or National Park
The southern end of the Koolyanobbing Range	Conservation of flora and fauna	Conservation Commission	'A' class	2 605	Nature Reserve or National Park
Parts of Lake Seabrook adjoining the southern end of the Koolyanobbing Range and proposed Jaurdi Conservation park and parts of Lake Barlee adjoining the proposed Mt Elvire Conservation Park	Conservation of flora and fauna	Conservation Commission	Either class A or other than class A (unclassified)	229 935	Conservation Park
UCL south of the Helena and Aurora Conservation Park and west of the proposed Jaurdi Conservation park	Conservation of flora and fauna	Conservation Commission	Either class A or other than class A (unclassified)	134 559	Conservation Park

**Note** – EPA advice additions refers to recommendations of reserve additions provided in the EPA 'Advice on areas of the highest conservation value in the proposed extensions to Mount Manning Nature Reserve' Bulletin 1256 (2007),

## Key Values

The key values associated with the Northern Yilgarn planning area are:

### *Nature Conservation*

- The area has a high diversity of land systems, landforms and vegetation types that warrant inclusion in the State's formal conservation reserve system;
- The Northern Yilgarn planning area falls within the transition zone between the Coolgardie and Murchison biogeographic regions;
- The area contains at least 32 endemic flora species, 7 species of Declared Rare Flora and 63 Priority species;
- The EPA has recommended the Mount Manning Range Region (Northern Yilgarn Planning Area) be recognised as a Biodiversity Hotspot for its combination of high levels of species richness, concentration of rare and endemic flora, restricted ecological communities and threatening processes associated with the mineral potential of the BIF Range environments, which coincide with the highest concentration of threatened and endemic species and communities in the region;
- The Northern Yilgarn planning area contains four main banded ironstone ranges (Die Hardy/Jackson/Windarling/Helena and Aurora Ranges), each containing a different species or subspecies of Declared Rare Flora of the genus *Tetratheca*;
- The Windarling Range contains the Declared Rare Flora *Ricinocarpos brevis* and *Tetratheca paynterae* subsp. *paynterae* which is also listed as Endangered under the *Environmental Protection and Biodiversity Conservation Act (EPBC) 1999* ;
- The Hunt Range in the Mt Manning Range Nature Reserve contains the Declared Rare Flora *Myriophyllum lapidicola*;
- The Helena and Aurora Range contains the species *Tetratheca aphylla*, Declared Rare Flora under the *Western Australian Wildlife Conservation Act 1950 (WCA)* and listed as vulnerable under the *EPBC Act* and Declared Rare Flora *Leucopogon spectabilis*;
- 20 rare vertebrate fauna have been reported from or expected to occur in the Northern Yilgarn planning area;
- Malleefowl which are listed as threatened under Western Australia's WCA occur within the Northern Yilgarn planning area;
- Many Ironstone ridges support Short-range Endemic fauna;
- There are records of the occurrence of chuditch which are listed as threatened under the WCA; and
- Excellent quality representative areas of cut over and old growth Eucalypt woodlands occur on Jaurdi.

### ***Cultural***

- The Northern Yilgarn planning area covers the country of the Wutha and Central West Aboriginal People and contains many cultural sites.

### ***Recreation and Tourism***

- The Northern Yilgarn planning area provides opportunities for visitors to enjoy a remote, outback experience and experience a diverse range of native flora and fauna;
- A number of publications exist highlighting four-wheel drive circuits, with further opportunity to develop low impact, sustainable touring four-wheel drive tracks which could incorporate features of interest and low impact camping; and
- There is an opportunity to permit licenced tour operators to conduct extended four-wheel drive/camping tours within the planning area.

### ***Education and Community Involvement***

- The opportunity exists to educate visitors about the unique landscapes, flora and fauna that occur within the Northern Yilgarn planning area; and
- The opportunity exists to provide interpretation to visitors on the natural, cultural and European historic values of the Northern Yilgarn planning area.
- The opportunity exists to work closely with the Koolyanobbing Community Reference Group in the development of the draft management plan.

### ***Monitoring and Research***

- Varying levels of research have been undertaken across select areas of the Northern Yilgarn planning area; and
- Opportunities exist for further research and monitoring of the Northern Yilgarn planning areas unique natural values.

### ***Indigenous Involvement in Management***

The Goldfields Land and Sea Council and the South West Aboriginal Land and Sea Council are the native title representative Aboriginal bodies for the planning area. The role of the native title representative Aboriginal bodies is to assist Aboriginal groups or individuals to make applications for native title, help resolve disagreements between groups making applications, and assist groups and individuals by representing them in native title negotiations and proceedings. There are two native title claims over the Northern Yilgarn planning area: the Wutha People (WC99\_010) and the Central West People (WC99\_029). Within the Central West People are the Gubrun and Kalamaia Kabu. The Conservation Commission and DEC acknowledge the aspirations of Aboriginal people to obtain native title over their traditional lands and waters under the provisions of the Native Title Act. Both agencies acknowledge that native title rights and interests may be found to exist, except where they have been legally extinguished under Australian law. The management plan will not however have any bearing in relation to Native Title Tribunal processes.

There is strong interest by Aboriginal people to be involved in the management of the conservation estate in Western Australia. Working together with Aboriginal people to care for the land will assist heritage and biodiversity conservation, strengthen the connection of Aboriginal people to their traditional or custodial lands, and enrich cross-cultural awareness. The State Government has shown a

commitment to explore joint management arrangements with traditional custodians by developing a consultation paper outlining options for ownership, administration and joint management of conservation lands in Western Australia (Government of Western Australia 2003). This paper outlines a range of possibilities, from consultative management through to joint management of the land that may be held by an approved Aboriginal Body Corporate as an inalienable freehold.

Arising from this broader Government initiative there is provision for the establishment of Demonstration Park Councils (DPCs) throughout Western Australia under the CALM Act. DPCs are partnerships between Aboriginal people and CALM for the joint management of specified areas of the conservation estate. The Conservation Commission will facilitate implementation of these partnerships, and work closely with DPCs to fulfil joint management responsibilities. The implementation of a DPC program will however be subject to an independent public review and finalisation of Government's policy position.

Aboriginal people will be involved in the planning and management process for the Northern Yilgarn planning area. It is proposed that meetings be held on country with the Aboriginal traditional owners for the Northern Yilgarn planning area to discuss issues, dreaming stories and management of the area.

The objectives of the CALM Act (s. 56) and more specifically the *Aboriginal Heritage Act 1972* require the protection of features of indigenous heritage value. The Department of Indigenous Affairs maintains an information database of registered Aboriginal sites in Western Australia, at least 75 of which are registered within the Northern Yilgarn planning area. These sites include scattered artefacts, ceremonial sites and sites of mythological importance. There have been no extensive or systematic searches for Aboriginal sites or heritage surveys in the Northern Yilgarn planning area to date. The limited number of registered sites is likely due to this lack of systematic survey incorporating the cultural knowledge of the area.

## **MANAGING THE NATURAL ENVIRONMENT**

### **Biogeography**

The Interim Biogeographic Regionalisation for Australia (IBRA) (Thackway and Creswell 1995) provides a planning framework for selecting a comprehensive, adequate and representative (CAR) system of protected areas to conserve and protect Australia's biodiversity.

The IBRA divides Australia into 85 separate biogeographic regions (bioregions), based on lithology, geology, landform and vegetation. The Northern Yilgarn planning area lies within the Coolgardie and Murchison Biogeographic Regions. The minimum recommended level of reservation for each bioregion to create a CAR reserve system using nationally recognised standards is generally acknowledged as 15% (CALM 2003).

The Coolgardie Bioregion is divided into three subregions. The majority of the Northern Yilgarn planning area falls within the Southern Cross subregion and is characterised by gently undulating uplands on granite strata and broad valleys with bands of low greenstone hills. Approximately 14.13% of the Coolgardie Bioregion is reserved and 21.54% of the Southern Cross subregion is reserved (DEC 2006).

The Murchison Bioregion is divided into two subregions, the East Murchison and the Western Murchison. The Northern Yilgarn planning area falls within the Eastern Murchison subregion and is characterised by internal drainage and extensive areas of elevated red desert sandplains with minimal dune development. The vegetation of the region is dominated by mulga woodland. Only 6.72% of the Murchison Bioregion and 7.58% of the East Murchison subregion are reserved as conservation reserves (DEC 2006).

## **Climate and Climate Change**

The Northern Yilgarn planning area has a semi-arid warm Mediterranean climate with mild wet winters and hot dry summers. The average annual rainfall is between 250mm – 300mm (McKenzie *et al* 2003). Most rainfall occurs in winter and is generally associated with frontal activity from May through to August. In Southern Cross, south of the planning area, average daily temperatures range from a minimum of 17°C to a maximum of 34.5°C during summer with temperatures peaking over 45°C and a minimum of 4°C to a maximum of 16.3°C during winter.

There is now broad scientific agreement that global climate change due to human induced increases in the concentrations of greenhouse gases is already apparent. Observed climate changes include an increase in global average temperatures of  $0.6 \pm 0.2^\circ\text{C}$  since 1900 (CSIRO 2001a). Changes evident in Western Australian climate during the last 90 years include rising daily average temperatures and consistent regional trends in rainfall changes, with the trend in the northern regions being to wetter conditions (Western Australian Greenhouse Taskforce 2004). Climate change will have implications for landscapes (particularly wetlands and granite outcrops), many flora and fauna species of conservation significance and fire. Consideration of the potential impacts of climate change, particularly on natural values, will require consideration in the plan.

## **Geology and Landforms**

The Northern Yilgarn planning area is part of the Yilgarn Craton, which has an exposed area of 657,000km<sup>2</sup> (GSWA 1990). A craton is described as a part of the Earth's crust that has attained stability and hasn't been deformed for a long period. As a result, most of the landscape has very little relief and slopes from north to south.

Across the Northern Yilgarn planning area are linear belts of metamorphosed Archaean sediments of two distinct types. Greenstone consists of volcanic material, and banded ironstone formation consists of lacustrine deposits of iron oxide and quartz sands. Banded ironstone formation is more resistant to weathering than granites or gneisses and usually occurs as low ridges, hills or a mountain range. Greenstone weathers at rates quicker than those of banded ironstone formation causing distinctive undulating plains. Mt Walter is an Archaean quartz intrusion and is the only one within the Northern Yilgarn planning area (Newbey K.R. 1985).

The Helena and Aurora Range (704m) and Bungalbin Hill (684 m); South West Peak (647m) in the Mt Manning Range; the Die Hardy Range (643m); Yorkradine Hills (629 m) and Mt Jackson (615m) are the prominent high points in the Northern Yilgarn planning area (Henry-Hall 1989). These features are all banded ironstone formations. The four greenstone mountain belts are the Koolyanobbing, Bullfinch, Hunt and Marda Complex Mountain Belts (Ecologia 2002).

## **Hydrology**

There are no permanent sources of fresh water within the Northern Yilgarn planning area. Semi-permanent rock holes and gnamma holes are rare in the area and include Pittosporum Rock, Kurrajong Rockhole and Bulgine Rockhole. Granite exposures such as Wogling and Dooling Soaks usually contain small depressions holding up to 50 cm of water following rain (Henry-Hall 1990).

Groundwater is mainly hypersaline with the mining companies the main users of this resource.

## **Native Flora and Vegetation Communities**

The Northern Yilgarn planning area has high conservation value due to the occurrence of a high number of endemic species, several rare and priority taxa and restricted vegetation types. There are over 1000 flora species recorded for the Northern Yilgarn planning area which includes 32 endemic species, 7 species of Declared Rare Flora and 63 Priority species (EPA 2007). In addition, it has been identified that a number of plant taxa may be rare but require further investigation to determine their ranges and taxonomic status/identity. They are not included in the current list of known species in the Northern Yilgarn Planning area. It is likely that further survey work would increase the number of flora species recorded (Herbarium 2006) as survey effort has generally been restricted to the ironstone ranges.

The Northern Yilgarn planning area is characterised by eucalypt woodlands, which occur widely throughout the area and give way to Acacia woodlands to the north. Within these two homogeneous vegetation communities are banded ironstone ranges, each containing distinctive floristic communities, many with high conservation value and significance. In addition, there are also wetland or dampland species that occur near the edges of salt lakes, in pools on granite rocks or along drainage lines.

### ***Mt Manning Range Nature Reserve and Conservation Park***

The Mt Manning Range Conservation Reserves straddle a major vegetation boundary – the mulga-eucalypt line – that marks the transition from low woodlands of Acacia to woodlands of Eucalyptus in the south. This boundary effectively separates the drier northern and more temperate southern parts of the eastern goldfields (Henry-Hall 1990).

The southern portion of the Mt Manning Range Nature Reserve contains extensive tracts of eucalypt woodlands and much of this area is essentially pristine, unmodified habitat. The Declared Rare Flora *Myriophyllum lapidicola* is found near the Hunt Range within Mt Manning Range Nature Reserve. Also occurring in the Mt Manning area are four Priority 1 flora species - *Calytrix creswellii*, *Eremophila* sp. Mt Jackson (G.J. Keighery 4372), *Lepidosperma* sp Mt Manning and *Psuedactinia* sp Bungalbin (F.H. & M.P. Mollemans 3069).

### ***Proposed Jaurdi Conservation Park***

The proposed Jaurdi Conservation Park has been surveyed extensively over the last 10 years. The proposed Jaurdi Conservation Park contains excellent stands of sandalwood. Much of the area that was cut for firewood along the woodlines in the early 1920s has since regenerated and is in good health (see also Non-Indigenous Heritage).

From a survey of the Hunt Range, Yendilberin and Watt Hills conducted in 1997, 285 taxa were recorded. Of these species one is Declared Rare Flora and five taxa were listed on the DEC priority list (Gibson and Lyons 1997).

Since 1997 further flora surveys have been conducted and have increased the species list for this area. A poorly known species, *Goodenia* sp. Jaurdi (L.W. Sage 1628), has been found to be restricted to the area and *Baeckea* sp. Jaurdi Station (L.W. Sage & F. Hort 2229) has only been collected from Jaurdi. Recent surveys have found Jaurdi Conservation Park contains the Declared Rare Flora *Myriophyllum lapidicola* and two Priority 1 species. Several granite outcrop areas occur in the southern section of the proposed Jaurdi Conservation Park. Only one of these outcrops has been surveyed, Seventy One Mile Rocks which supports an outlying population of the Priority species *Wurmbea murchisoniana*. It is likely that further surveys may discover flora of conservation significance on the other granite outcrops and in the banded iron hills.

### ***Proposed Mt Elvire Conservation Park***

The proposed Mt Elvire Conservation Park has high conservation value for flora including good examples of chenopod lake frontage vegetation in the Goldfields, an outlier population of Western Myall trees, *Acacia papyrocarpa*, and the geographically restricted *Eucalyptus formanii*. The Mt Elvire area also contains extensive stands of sandalwood (CALM 1994).

While the proposed Mt Elvire Conservation Park has had basic biological surveys conducted, there have not been extensive systematic biological surveys and as a result there is a lack of detailed knowledge on the biodiversity of the area.

### ***Helena and Aurora Range Conservation Park***

The Helena and Aurora Range Conservation Park is a virtually undisturbed habitat. The vegetation mosaic found on the sandplains near Bungalbin Hill contains collections of rare, poorly known and undescribed flora. Gibson (*et al* 2007) found that within an area of 646km<sup>2</sup> there were two DRF and eleven Priority 1 species. Five taxa were found to be restricted to the Helena and Aurora Range.

Bungalbin Hill which is part of the Helena and Aurora Range includes several flora species that are listed as Priority taxa as well as rare species which are geographically restricted but locally abundant. Helena and Aurora Range contains the species *Tetradthea aphylla* which is Declared Rare Flora under Wildlife Conservation Act and listed as vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This species is confined entirely to BIF range and has a geographical range of little more than 10 km. Also found on the Helena Aurora Range is *Leucopogon spectabilis*, Declared Rare Flora under the Western Australian Wildlife Conservation Act and restricted to the BIF. Further surveys are expected to reveal additional restricted flora and diversity.

### ***Proposed Die Hardy/ Jackson/ Windarling Ranges Reserves***

The proposed Die Hardy/Jackson/Windarling Ranges Reserves is characterised by three banded ironstone ranges. These ranges contain restricted flora and vegetation types. Each of the ironstone ranges contain Declared Rare Flora entirely confined to the banded ironstone hills in the vicinity of Mt Jackson and Windarling and restricted flora on the Die Hardy Ranges and Yokradine Hills.

Windarling Range contains two DRF species and two Priority 1 species. *Ricinocarpos brevis* is a Declared Rare Species recorded in the Windarling Range. Recently this species has been located on Johnston Range just outside the EPA proposed additions on Diemals pastoral lease, however further surveys are required for the population distribution. *Tetradthea paynterae* subsp. *paynterae* which was declared as Rare Flora under the Wildlife Conservation Act in 1991, listed as Endangered under the EPBC Act in 2000. It is known from one location (two sub-populations) and there is a continuing decline in the area, extent and quality of habitat due to mining.

*Tetradthea paynterae* was named in honour of Mrs Ray Paynter who discovered the plant in 1988 (Cockerton et al 2005).

Jackson Range contains the species *Tetradthea harperi* which is Declared Rare Flora under Wildlife Conservation Act and listed as vulnerable under the EPBC, and eight Priority 1 species.

Die Hardy Range and Yokradine Hills contain the Declared Rare Flora *Tetradthea paynterae* subsp. *cremnobata* and two priority 1 species. Die Hardy Range contains populations of *Prostanthera magnifica* and the endemic *Eucalyptus formanii* (Forman's Mallee) occurs on the surrounding sandplain.

Pigeon Rock is the largest of a series of granite outcrops that support distinctive vegetation complexes including poorly known eucalypts and diverse orchids and the Priority 1 species *Baecka* sp. Pigeon Rocks (D. Grace DJP 281).

### **Native Animals**

The rich and diverse fauna of the Northern Yilgarn planning area reflects its biogeographical location with a mix of fauna from the two bioregions. This area is the interzone between the temperate south-west and the semi arid rangelands which results in a blending of arid zone and south-western species. The proposed conservation reserves incorporate biologically important areas where species overlap and are at the limits of their range. Many vertebrate species that inhabit the Banded Ironstone Formations have high conservation significance and are listed under the State Wildlife Conservation Act 1950 as threatened fauna or are listed as Priority fauna by DEC because of limited distribution (DEC 2007). In addition, Ironstone ridges and associated slopes support Short-Range Endemic fauna (primarily invertebrate fauna with a highly restricted distribution).

Fauna surveys have been conducted throughout the Northern Yilgarn planning area since the 1980s and some areas are part of ongoing research plots which have been surveyed for around twenty years. While some areas have been surveyed extensively, other areas require further work. It is likely that further fauna surveys will reveal a greater number of species. The level of knowledge regarding many native animals in the Northern Yilgarn planning area, particularly the distribution, ecology and conservation status of reptiles, amphibians and short range endemics, is incomplete and requires further work.

The fauna records from the WA Museum (2006) for the Northern Yilgarn planning area include:

- 35 mammals (including 9 bats);
- 87 reptiles; and
- 6 frogs.

Research indicated that 20 rare vertebrate fauna have been reported from or expected to occur in the Northern Yilgarn planning area (EPA 2007). Recent studies in 2007 by Portman Iron Ore Ltd in the Windarling and Jackson area have found the existence of the Treestem Trapdoor Spider (*Aganippe castellum*) which is listed as Vulnerable under the Wildlife Conservation Act and not previously been recorded in the Goldfields.

Records also include evidence that the area supported up to 11 other mammal species which are now extinct to the area, including the chuditch (Western Quoll, *Dasyurus geoffroii*) which is listed as threatened under the Wildlife Conservation Act and as Vulnerable under the EPBC Act. There is the potential for the re-introduction of the chuditch and this should be investigated as part of the management planning process.

There are records also for both the lesser stick-nest rat and the brush-tailed possum for the Helena and Aurora Range (Chapman et al 1995). The lesser stick-nest rat is now extinct in Australia while numbers of the brush-tailed possum have declined markedly in the arid and semi-arid zone.

There are 133 bird species from the WA Museum (2006) recorded in the Northern Yilgarn planning area. One species of significance is the malleefowl (*Leipoa ocellata*) which is listed as threatened under the Wildlife Conservation Act and Vulnerable under the EPBC Act. Major Mitchell's Cockatoo also occurs in the Northern Yilgarn planning area and is listed as specially protected fauna under the Wildlife Conservation Act.

The rainbow bee-eater (*Merops ornatus*) also occurs in the Northern Yilgarn planning area and as a migratory bird under the EPBC act. There is also evidence that a number of other bird species listed

under the international migratory bird agreement between Australia and Japan (JAMBA) may be found in the planning area.

There are seven introduced animals recorded for the Northern Yilgarn planning area (see Introduced and Other Problem Animals Section).

### **Environmental Weeds**

A major threat to natural ecosystems and native species is environmental weed invasion. DEC's draft Policy Statement No. 14 - *Environmental Weed Management* - guides the approach and priority setting for the control of environmental weeds on DEC managed estate. DEC has legal responsibility to control declared weeds under section 35 of the *Agriculture and Related Resources Protection Act 1976* where practicable. DEC also has management responsibility for controlling environmental weeds. The *Environmental Weed Strategy for Western Australia* (CALM 1999) classifies weeds in relation to their invasiveness, distribution and environmental impacts.

Environmental weeds have the potential for serious impact on natural systems and nature conservation values through displacing native plants, particularly on disturbed sites, by competing with them for light, nutrients, water and space. Weeds can also have adverse impacts on other conservation values by altering animal habitats, harbouring pests and diseases and increasing fire hazard.

There are 26 weed species recorded from the Northern Yilgarn planning area (WA Herbarium 2006). Weed numbers in the Northern Yilgarn area are low compared with other areas of Western Australia. This is probably attributed to the low levels of modification to the vegetation community. It should be noted that the number of weeds stated above includes only those weeds that have been collected and vouchered with the WA Herbarium. It is possible that more weed species may occur in the Northern Yilgarn planning area however they have not yet been located, identified and vouchered.

### **Introduced and other Problem Animals**

Problem animals have the potential to adversely impact on natural systems and biodiversity values. Adverse impacts can be through predation of native animals, habitat destruction, competition for food and territory and accelerating erosion. Problem animals can be either native species that impact on natural and agricultural values or feral animals (introduced species that have become established as wild or naturalised populations).

The problem species present in the Northern Yilgarn planning area include the feral cat, fox, wild dog, goat, house mouse, European honey bee, rabbit, camel and donkey.

DEC, with Portman Iron Ore Limited, is undertaking a Predator Control Program. The program occurs in the semi-arid woodlands of the Coolgardie Bioregion at Portman's leases at Mt Jackson/Windarling and within the Mt Manning Range Nature Reserve. The program involves baiting select sites for feral cats, foxes and wild dogs. The aim of the program is to obtain sustained control of these introduced feral predators for the selected areas. Once feral predator control has been demonstrated, there is the opportunity for DEC to carry out fauna translocations with locally extinct species such as the chuditch.

### **Fire**

Fire is a natural element in ecosystems. Whether fires have a detrimental impact on natural systems will be determined by the fire regime (frequency, size, season and intensity). In the Northern Yilgarn planning area, the biota has developed adaptive traits that enable the flora and fauna to persist with, and in some cases rely upon, a variety of fire regimes.

Current knowledge indicates that in order to optimise and protect biodiversity, fire regimes need to be applied that provide for an interlocking mosaic of patches of vegetation and habitats that represent a

range of fire frequencies, fire intervals, seasons, intensities and scales. Prescribe burning is a fire management tool used to maintain the biodiversity of a wide range of ecosystems, reduce fuel loads to reduce the intensity of wildfire and to rehabilitate areas after disturbance. In 2006 and 2007, aerial and hand burning was utilised within the proposed conservation reserve additions of the planning area for the purpose of maintaining biodiversity and protection of assets.

Lightning is the main source of ignition in the Northern Yilgarn planning area. Strikes are largely random in spatial distribution but are most likely to start fires when they occur in the heath and mallee vegetation of the sandplains, and close to granite outcrops.

Part of the proposed Jaurdi Conservation Park is covered by a Wildfire Threat Analysis and Fire Prevention Plan for the Crown lands between Coolgardie and Southern Cross (WTA Fire Plan) which was produced by the Fire and Emergency Services Authority (FESA) and DEC. The purpose of the WTA Fire Plan was to protect valuable assets by mitigation, detection and suppression located in the Coolgardie to Southern Cross area.

Fire management is an issue at the proposed Jaurdi Conservation Park as the Perth-Kalgoorlie train line runs through the area. The Perth-Kalgoorlie line is a major route for freight from the eastern states, carries iron ore mined at Koolyanobbing and is used by the Prospector and Indian Pacific passenger trains. The line runs through the southern end of Jaurdi. This area requires protection against fire and was listed in the WTA Fire Plan, together with other transport and communications infrastructure. DEC and FESA has conducted burning along parts of the railway line east of Jaurdi siding for the protection of the line against wildfire.

Fire Management for the Northern Yilgarn planning area will consider the protection of biodiversity, assets and infrastructure and visitor safety. It will incorporate information from the WTA Fire Plan, the Portman Fire Management Plan and other research and monitoring findings.

## **MANAGING OUR CULTURAL HERITAGE**

### **Indigenous Heritage**

The earliest known inhabitants for the Northern Yilgarn planning area were members of the south-west and western desert social and cultural bloc. These indigenous people were speakers of the Kalaamaya language and were hunters and gatherers (Ecologia 2002).

Indigenous culture and heritage are based on the country and the interactions of the landscape and the ecology. The regional mythology of the Northern Yilgarn planning area includes the Nganamarra or malleefowl ancestor, a topography-creating being who circled the area. The banded ironstone ranges and hills in this area have a high mythological significance to the Aboriginal people (Henry-Hall 1990). A number of rock holes in the planning area have signature markings from aboriginal people who worked as ‘doggers’ in past years.

### **Non-Indigenous Heritage**

The first explorers to traverse the Northern Yilgarn area were the Gregory Brothers who named Mt Jackson in 1846 while searching for good grazing country. The country was extremely dry around Mt Jackson in August 1846 and so the brothers left the area disappointed.

In October 1875, Ernest Giles travelled through the Northern Yilgarn area on his expedition from Port Augusta in South Australia to Perth in Western Australia. In his journal from this expedition he makes note that the composition of Mt Jackson was “almost iron itself, and there were some fused stones like volcanic slag upon it.” Giles named Pigeon Rocks on this journey as a result of catching many bronze-winged pigeons (Giles E. 1889).

In 1869, John Forrest skirted the very northern edge of Mt Elvire and named Lake Barlee after the Colonial Secretary of Western Australia. Forrest also named Mt Elvire after his wife Margaret Elvire (Hammersly) Forrest (Forrest 1875). Forrest also named the Helena and Aurora Range after the daughter (Helena Aurora Munger) of Henry Munger of York (pers comm. Ian Elliot, 2006).

In 1888, the Yilgarn Goldfields were declared and by 1894 two goldmines were operating near Mt Jackson. Small quantities of silver were also produced as a by-product of gold mining.

The township of Koolyanobbing was established in the 1950s and a rail link was laid down that passed through Koolyanobbing transporting iron ore to Kwinana. The mine was operated by BHP from the mid 1960s. As mining fell away the town was abandoned in 1983 with closure of the mine. The mine was re-activated in 1994/95 by Portman Iron Ore Limited (Ecologia 2002).

Jaurdi Station was used for woodline timber cutting between 1910-1920 to supply Kalgoorlie mines with fuel for boilers, power generation and timber for mine shafts. A number of woodline spur lines off a main woodline that ran from Kurrawang via Wallaroo Rock can still be found.

Jaurdi Station was first taken up as a pastoral lease in 1968. The station was called Jaurdi until November 1986 when the lessee changed it to Timberfield. On 2/12/98 the name Timberfield was changed back to Jaurdi through the Department of Land Administration. Sheep were the main stock on the station. In 1989, CALM purchased Jaurdi under the Sandalwood Conservation and Regeneration Project (SCARP).

Malcolm Campbell Ross of Menzies first took up Mt Elvire Station in 1966. Formerly a sheep pastoral station, it was never fully stocked or developed. In June 1991 CALM purchased the station under the SCARP project.

## **MANAGING RECREATION AND TOURISM**

### **Recreation and Tourism Opportunities**

The Northern Yilgarn planning area is part of a relatively undisturbed natural environment with the potential to offer visitors a remote, outback experience. Visitors are able to enjoy the changing land forms and landscapes of sandalwood, various Eucalypt woodlands, banded ironstone ranges and extensive sandplains.

The Northern Yilgarn planning area also provides for remote four-wheel driving, camping and the opportunity for nature appreciation. Due to the climate, lack of permanent water sources and the remoteness of the area, most visitation occurs in the cooler winter months.

### **Camping**

The Northern Yilgarn planning area provides visitors with several options for camping and experiencing the area. There is formal camping at both the Jaurdi and Mt Elvire homesteads and informal/vehicle-based camping throughout the conservation reserves.

The homestead on Jaurdi provides basic facilities for camping including a shower, drinking water, a toilet, rubbish bins, tables, pot belly stove, wood-fired BBQs, shearers quarters and an open shed for sleeping. A generator can be connected to the homestead in order to provide lighting. Although drinking water is provided, it is seasonal and visitors are recommended to take their own.

The homestead at Mt Elvire provides shelter, drinking water and a toilet. There is a kitchen with a wood-fired stove and several bed frames as well as a long drop toilet, tables and a BBQ. The water is

seasonal and is reliant on rainfall so visitors are advised to take their own. A generator can be connected to the homestead facilities to provide lighting.

A booking system is in place for visitors wanting to camp at Jaurdi and Mt Elvire homesteads. Visitors are required to visit or call the DEC office located in Kalgoorlie to book camping at the homesteads and can obtain information on the facilities provided. Information can be found on DEC's naturebase website. Standard DEC camping fees apply to both homesteads.

All other camping within the Northern Yilgarn planning area is informal camping and visitors are asked to take all rubbish with them as rubbish bins are only provided at Jaurdi and Mt Elvire homesteads. No camping fees are charged for visitors who bush camp within the Northern Yilgarn planning area.

### **Recreation Opportunities**

There are a number of four-wheel drive trips that are promoted in 4WD magazines that traverse through the proposed Jaurdi Conservation Park and the Helena and Aurora Range. Passing through the proposed Jaurdi Conservation Park is the old Goldfields stage coach route (Cobb and Co.) also known as the Gus Luck Track. This track begins at Yellowdine on the Great Eastern Highway and travels north-east through the proposed Jaurdi Conservation Park ending at Goongarrie. The track follows a series of rocks from Darrine to 71 Mile Rock where old tin-covered and rock-lined soaks and wells receive their water as run-off from adjoining granite rocks. Visitors use this track, however it should be noted that the track is very rough in places.

There is the potential to develop a number of formalised four-wheel drive tracks that would run from Jaurdi through to Mt Elvire homestead and from Jaurdi along the woodlines to Wallaroo Rock. The four-wheel drive tracks would be designed to incorporate features of significance and interest. It would then be possible to develop interpretation material and track notes, which would explain features of interest including natural, cultural and European history along the drive.

As part of the proposed four-wheel drive tracks, it would be ideal to develop basic camping areas at strategic locations. Developing designated camp sites would minimise the adverse impacts of uncontrolled camping and would protect sensitive landforms and cultural sites from damage. This opportunity and any other potential recreational opportunities will be investigated as part of the management planning process.

### **Visitor Access**

Road access to the Northern Yilgarn planning area is via the Great Eastern Highway. There are several entries into the Northern Yilgarn planning area including Ryan's Find Road, Bullfinch-Evanston Road, the Evanston-Menzies Road and the Mt Walton Road (also known as the Health Road). All roads within the Northern Yilgarn planning area are gravel roads or bush tracks. Some of the more remote and less used tracks have minimal clearing and caution should be taken.

Access through the Northern Yilgarn planning area is restricted during wet weather as the tracks can become slippery and there is a high risk of becoming bogged. All tracks within the Northern Yilgarn planning area are maintained by DEC. Main tracks within the planning area will be assessed under DEC Road Classification System. The Shire of Menzies maintains the Evanston-Menzies Road while the Shire of Yilgarn maintains the Bullfinch-Evanston Road.

There are many old and active exploration tracks throughout the Northern Yilgarn planning area. Many of the old tracks need to be closed and rehabilitated. Visitors may become lost and unmaintained tracks can lead to erosion. The rationalisation of roads and tracks within the Northern Yilgarn planning area will be addressed as part of the management planning process.

## **Tourism and Commercial Operations**

A commercial concession is a right granted by way of lease, licence or permit for occupation or use of part of an area of DEC-managed land for the purposes of providing appropriate facilities for visitors' use and enjoyment. All commercial visitor services operating on DEC-managed lands must have a licence or lease issued by DEC.

Leases are issued when the activity involves significant infrastructure and/or retailing and requires the exclusive use of the land. There are currently no leases issued within the Northern Yilgarn planning area and it is unlikely that a lease would be required within the life of the first management plan.

Licences are issued to facilitate the entry and use of DEC-managed lands and generally do not involve substantial structures. Licenced activities include nature-based tours (such as safari tours, wildflower tours and four-wheel drive tours). There are two types of commercial licence available. T Class licences are issued for activities where it is not necessary to restrict the number of licences while E Class licences are issued where it is necessary to restrict the number of licences for environmental management and/or visitor safety reasons. The period of a licence will vary according to several criteria. There are currently no licenced commercial tour operators within the Northern Yilgarn planning area, however there is the potential for the development of a commercial tour, for example a safari tour or tag-along four-wheel drive tour.

## **Visitor Safety**

The Department has a moral and legal responsibility to provide for the safety of visitors on DEC-managed lands, however there is inherent risk associated with a visit to natural environments. All reasonable efforts need to be taken to minimise risk to visitors, consistent with DEC Policy No. 53 - Visitor Risk Management. Management practices aim to minimise risk to visitors whilst also retaining the natural attraction of recreation areas. Factors that contribute to visitor risk in Northern Yilgarn planning area include:

- climate (eg. dehydration and sun exposure);
- hazardous terrain (eg. banded ironstone ranges);
- remoteness (eg. a person lost or injured, a bogged or broken down vehicle);
- fire; and
- dangerous wildlife (eg. snakes).

## **Domestic Animals**

Domestic animals are not permitted in national parks or conservation parks, except in specifically designated areas, or where dogs are required for use by the disabled or for emergency (search and rescue) purposes. Dogs on a lead may be allowed on other categories of reserve according to a management plan for that reserve. Domestic animals are not permitted on nature reserves. Impact from domestic animals can include interference with wildlife, fouling of visitor areas, unpredictable behaviour and the associated safety risks to visitors and environmental impacts.

Some areas within the Northern Yilgarn planning area are baited to control wild dogs and foxes. There may be dangers to pets arising from baiting operations and therefore baited areas are signed advising people of the dangers posed by the laying of baits.

## MANAGING RESOURCE USE

### Traditional Hunting and Gathering

For Aboriginal people, hunting and gathering is an important part of their culture which allows them to maintain relationships and connections with the land and water, share knowledge and participate in traditional practices. Under section 23 of the Wildlife Conservation Act and with prior consent from the occupier of the land (Director General of DEC), Aboriginal people may take flora and fauna for food from all land except a nature reserve or wildlife sanctuary. The quantity of food taken must only be sufficient for a person and family and is not permitted to be sold. General provisions of the CALM Act and the Wildlife Conservation Act apply to Aboriginal activities. For instance firearms may not be carried on a reserve.

### Mining

Mining is a significant industry for the economy of Western Australia. It is particularly important in contributing to the growth and development of the Goldfields Region. Many areas within the Goldfields Region have are highly prospective for minerals and the Northern Yilgarn planning area is no exception. The Northern Yilgarn planning area also has a very high conservation value with many Declared Rare Flora and priority flora. It is very important that through the planning process a balance is found between mining and conservation.

Mineral tenements (and applications for mining leases and exploration licences) present within or adjacent to the Northern Yilgarn planning area include those for iron ore, nickel and gold. There are approximately 74 holders of mining tenements across the Northern Yilgarn planning area. There are a number of current active exploration activities in the Northern Yilgarn planning area and a small number of prospecting and mining operations.

Of these mining tenements several are inactive and currently in the care and maintenance stage, while 1 mining shaft is due to be built. Several operations are no longer active and require removal of equipment and rehabilitation of the site.

The only active extensive mining operation currently occurring within the Northern Yilgarn planning area is located within the proposed Die Hardy/Mt Jackson/Windarling Ranges Conservation Park. The mining operation is conducted by Portman Iron Ore Limited which is mining for iron ore.

Portman Iron Ore Limited began their mining operations in 1994/95 at Koolyanobbing which is located 425 km east-north-east of Perth and 54 km north-east of Southern Cross. In 2002 Portman Iron Ore Limited proposed to expand their mining operations to include Mt Jackson Range (located 67 km north of Koolyanobbing) and Windarling Range (located 90 km north-north-west of Koolyanobbing).

Portman Iron Ore Limited was required to prepare a Public Environmental Review (PER) in accordance with the State *Environmental Protection Act 1986* and the EPBC Act. The PER outlined the mining proposal and the likely effects on the environment and provided the public with opportunity to give comment. Comments from the public and government agencies were then used by the Environmental Protection Authority to aid in the preparation of an assessment report which would make recommendations to Government.

The Minister for the Environment approved the mining of Mt Jackson and Windarling Ranges subject to Ministerial Conditions. Under these Ministerial Conditions, Portman Iron Ore Limited was required to develop an Environmental Management Programme which comprised of a series of management plans for key environmental issues, including malleefowl, fire, weeds, *Tetratheca* and dust management (see also Scientific and Research Use).

Mining includes exploration, fossicking, prospecting and mining operations. Mining on land managed by DEC is in accordance with the *Mining Act 1978*, *Petroleum Act 1967*, *Petroleum Pipelines Act 1969* and *Petroleum (Submerged Lands) Act 1982*. In national parks and nature reserves, Government policy is that they are not available for new mining and petroleum tenements, except in the case of applications lodged before February 2001. The granting of a mining lease (or general purpose lease associated with mining operations) within a national park or A class nature reserve requires the consent of both Houses of Parliament.

Departmental responses to proposed mining and petroleum developments relevant to the Northern Yilgarn planning area will be in accordance with Government and Conservation Commission policies applicable at the time. Guidance on mineral exploration and mining in conservation reserves is provided by the publication *Guidelines for Mineral Exploration and Mining within Conservation Reserves and other Environmentally Sensitive Lands in Western Australia* (1998).

The exploration and subsequent mining of minerals in Western Australia is primarily administered by the Department of Industry and Resources through the granting of various tenements including prospecting licences, exploration licences and mining leases.

In 2004 the Minister for the Environment said the Government would seek under Section 16 of the *Environmental Protection Act* advice from the Environmental Protection Authority regarding which areas of the Northern Yilgarn area would be environmentally unacceptable in terms of mining and development. The Environmental Protection Authority would also provide information on the areas of the highest biodiversity value. This report was released in May 2007. A further report, prepared for Government by the Department of Environment and Conservation and Department of Industry and Resources '*The Strategic Review of the Conservation and Resources Values of the Banded Ironstone Formation of the Yilgarn Craton*' (2007), has led to a Cabinet Decision that will guide the management of the Banded Ironstone Formation for conservation and mining interests.

In light of the high conservation values of the flora found on the banded ironstone formations within the planning area it will be essential to develop a mechanism during the planning process to resolve mining and conservation conflicts. There will be very important decisions to be made concerning the approval of mining within the planning area.

## **Pollution**

The main source for potential pollution would be from the railway and mining operations at Windarling and Mt Jackson Ranges. This pollution would be in the form of transported goods, fuels and oils and dust. Under the Ministerial Conditions imposed on Portman Iron Ore Limited a Dust Management Plan was prepared. This plan addresses ongoing monitoring measures to minimise dust during construction and operation and prevention of adverse impacts on the *Tetratheca* communities near the mining operations.

Another potential source of pollution is the Intractable Waste Disposal Facility (IWDF) Class V Landfill which is located on UCL approximately 53 km north-east of the Jaurdi homestead. It was established in 1988 as a secure disposal option for the State's low-level radioactive and intractable waste (waste that is to be stored as there is no practicable alternative destruction or treatment technology available). The facility is used only when it has been demonstrated to the Environmental Protection Authority that there is no alternative treatment for the waste in Australia. The trenches are lined with clay to prevent leaching and capped to shed water which ensures there is no build up of water that may become contaminated and flow elsewhere. The facility is only used for waste that has been generated in Western Australia (Environmental Protection Authority 2000). The site is licensed by the DEC and each individual application to dispose of waste requires approval from the EPA.

The IWDF occupies a 25 km<sup>2</sup> reserve located on Crown land and is vested under the Department of Housing and Works. The Landfill is primarily controlled via an extensive range of plans and

guidelines developed as a requirement of Ministerial Condition 562. The Ministerial Conditions are administered by the Compliance Monitoring Section (CMS) of the DEC. Access to the site is provided by a 100 km long dedicated unsurfaced road that extends northward from Boorabbin on the Great Eastern Highway and adjoins the eastern boundary of the proposed Jaurdi Conservation Park for part of its route. The road has been recently graded. The area is fenced and entry is prohibited.

### **Beekeeping**

Commercial beekeeping is a small but significant industry in Western Australia, with an average annual total income for honey production of approximately \$9.3 million and a total worth (including pollination of agricultural and horticultural crops) of approximately \$120 million per annum (2002/2003 data) (Manning 1992). Apiarists in Western Australia have traditionally relied on large areas of native vegetation for honey production, and are increasingly dependent on lands managed by DEC as other areas are cleared for urban development and agriculture.

For all apiary sites on Crown land in Western Australia (including land not managed by DEC), the apiarist must obtain a permit from DEC. As of June 2004, there were 3226 permits for apiary sites on Crown land. The majority of permits for these sites are in the jarrah forest between Mundaring and Collie, the sandplains north of Yanchep to Geraldton, the woodlands of the Goldfields and Ravensthorpe Range, and the southern forest between Donnybrook and Walpole. Seventeen per cent (558 sites) are currently on conservation reserves managed by DEC with a further 13% (412 sites) within proposed conservation reserves. Within the planning area there are 11 apiary sites registered sites at the time of publication, all of which are located within the proposed Jaurdi Conservation Park.

General guidance for the management of apiculture on Crown land is provided by the Department's draft Policy Statement No. 41 – *Beekeeping on public land*, which is under review after a public comment period. Under the draft policy DEC will maintain (and renew) current apiary site permits on all classes (tenures) of land, but permit no additional apiary sites on land currently or proposed to be reserved primarily for nature conservation purposes, until a management plan has been prepared. In this instance, DEC and the Conservation Commission, through the management planning process, will consider whether access for beekeeping is either retained at the current level, increased, decreased or phased out based on appropriate ecological and management criteria. Thus the management planning process will identify suitable areas for beekeeping whilst minimising the potential impacts of managed honey bees.

Whilst it is recognised that feral honey bees are more of a threat to the values of conservation reserves than managed honey bees (see Section on Introduced and other Problem Animals), there is little knowledge about the range of conditions which honey bees leave the hive, and become feral. In the meantime, DEC and the Conservation Commission will take a pragmatic and precautionary approach with regards to allowing beekeeping in conservation reserves.

### **Defence Force Training**

Defence training does occur within the proposed Jaurdi Conservation Park. The training generally occurs every few years and only for a limited time. Department policy recognises that defence force training is a use of some Departmental lands, although some activities can conflict with conservation objectives and recreational values and may not generally be appropriate in parks (eg. taking vehicles off roads and tracks). However, proposals are assessed on an individual basis so that particular requirements of each exercise can be considered, impacts assessed and appropriate conditions applied.

### **Scientific and Research Use**

Research and monitoring can provide knowledge which aids in the planning and management of a protected area. Extensive research has been carried out on the flora and fauna of selected areas within the Northern Yilgarn planning area. Research and monitoring has been undertaken by a number of

organisations and individuals including DEC, the University of Western Australia, the Western Australian Museum (WA Museum), private consultants and by volunteers associated with Landscape Expeditions.

As a requirement of the Ministerial Conditions, Portman Iron Ore Limited has carried out and is continuing to monitor the Windarling and Mt Jackson areas for:

- malleefowl monitoring which now includes feral predator monitoring;
- dust monitoring;
- *Tetratheca paynterae* subsp. *paynterae* monitoring of numbers, individuals, their health, viability of the population and reproductive success. Portman Iron Ore Limited also conducts research into the ecology and potential translocation of the *Tetratheca* species;
- monitoring of *Ricinocarpos brevis*; and
- weed monitoring.

Some areas of the Northern Yilgarn planning area are part of ongoing monitoring sites through the University of Western Australia and the WA Museum. While some areas of the Northern Yilgarn planning area have been extensively surveyed, there are also many areas that have limited biological information on the flora and fauna and require investigation and survey.

### **Public and Private Utilities and Services**

The Perth-Kalgoorlie rail line passes through the southern end of the proposed Jaurdi Conservation Park. The rail line is a major route for freight from the eastern states, it carries iron ore mined at Koolyanobbing and is also used by the Prospector and Indian Pacific passenger trains. The protection of the rail line will be considered with regard to fire management during the management planning process.

Running alongside the rail line is a private road maintained by Westnet which is for maintenance/operational purposes. Access along this road is prohibited unless authorised.

A private road, Mt Walton Road (also known as the Health Road), joins the Great Eastern Highway and travels north to the Intractable Waste Management Disposal Facility. This road runs along a portion of the proposed Jaurdi Conservation Park eastern boundary.

### **Rehabilitation**

Rehabilitation within the Northern Yilgarn planning area may be necessary as a result of mining, roadworks, gravel pit works, track closure or activities associated with fire suppression. To ensure that rehabilitation works have the greatest degree of success, as well as limiting the introduction of exotic (non-local) plants and enabling new vegetation to blend into the existing environment, native species of local origin (ie. within 5 km of planting site) will be used whenever possible.

DEC's Policy No. 10 *Rehabilitation of Disturbed Land* provides guidelines for implementing best practice rehabilitation based on the following principles:

- land should be managed as far as possible to avoid disturbance;
- rehabilitation should be the last option in a series of management decisions designed to protect environmental values; and
- rehabilitation should aim to restore original values and help to enhance all potential uses provided the priority uses are not adversely affected.

## **Forest Products**

Sandalwood collection and burl harvesting are carried out from a few areas of unallocated Crown land surrounding the Northern Yilgarn planning area. The Forest Products Commission is currently harvesting and regenerating sandalwood from Diemals Station outside the 2015 excision area. There is currently no sandalwood collection or burl harvesting occurring within the Northern Yilgarn planning area. Discussions for harvesting and regeneration of sandalwood in the Northern Yilgarn Planning area will occur during the planning process.

## **INVOLVING THE COMMUNITY**

### **Information, Education and Interpretation**

Community education and participation in management are important means of generating community understanding and support for the values and management of conservation areas.

Due to the remote location of the Northern Yilgarn planning area and low visitation, there are currently no interpretation signs provided within the planning area. The only form of interpretation for the area is limited information at Jaurdi and Mt Elvire homestead sites, some signage and through the DEC Goldfields Magazine. This magazine is a free publication which describes the environment and all the recreation areas within the Goldfields. It includes a section on the proposed Jaurdi Conservation Park and outlines the location, facilities and what activities are available.

Information on the Northern Yilgarn planning area can be obtained through contacting the DEC office in Kalgoorlie and on DEC's naturebase website.

There are several publications of four-wheel drive magazines such as *Australian 4WD Monthly* which have articles written about Jaurdi Station, described as an enjoyable getaway for the four-wheel drive enthusiast.

*Landscape* magazines periodically has articles about areas in the planning area, flora and fauna. There are also a few tour operators who travel through the Northern Yilgarn area as part of their itinerary.

There is potential to promote the Northern Yilgarn planning area and to develop some interpretation signage or information sheets (cultural and environmental) that may link in with the proposed four-wheel drive track. All ideas will be investigated during the planning process.

### **Working with the Community**

Community involvement is an integral component of DEC's operations. Involvement from the community, incorporating groups, and individuals and the indigenous community, in both planning and management is encouraged. The community has an important role to play in the preparation of the Northern Yilgarn Conservation Reserves Management Plan. Community involvement in the planning process will be facilitated through public meetings, regular newsletters and through submissions on the draft management plan.

Under the Ministerial Conditions placed on Portman Iron Ore Limited, a community reference group was established. The Koolyanobbing Community Reference Group was formed to look at conservation issues associated with the mining operations at Windarling and Mt Jackson Ranges. These conservation issues include:

1. The environmental aspects of operations at the Windarling Range and Mt Jackson deposits and the provision of community feedback and input on such matters; and
2. The translocations/rehabilitation and survival of *Tetratheca paynterae* subsp. *paynterae*, restricted ecological communities and other flora of particular conservation significance in all proposal locations.

As part of the planning process DEC will be liaising with the Koolyanobbing Community Reference Group and all other interested stakeholders to ensure that the community has involvement and input into the management planning process.

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#### **Personal Communications:**

Mr Ian Elliot 2006.