REGIONS OF SIGNIFICANT CONSERVATION VALUE WITHIN KARIJNI NATIONAL PARK.

SUMMARY:

Karijini National Park is the second largest national park in Western Australia (Sandell *et al.* 1989). As a consequence of it's size the park contains a diverse range of arid land ecosystems and habitats. The rugged nature of the park together with the relatively short period of European settlement has protected many of the habitats within its boundaries from the debilitating effects of pastoralism (Sandell *et al.* 1989). As a consequency of this many areas within the park have very high conservation values.

This survey documents the features of Karinjini National Park within and around Hamersley Iron's temporary reserves and exploration leases that might require specific consideration in developing exploration and/or minning proposals. While all the features docmented in this survey have conservation values that are higher than the parks typical vegetation communities (hummocked grasslands) it is possible to rank the features according to their level, of importance.

Six areas were ranked as having very high conservation values.
The Gorge and Water Course areas in lease TR5615H
The Amphitheatre area in lease TR5622H
Two areas in lease TR5624H contained rare flora *Geigera* spp. and *Eremophila* spp.
Mulga Coolabah Woodland 1 to the west of lease TR5624H
The Gap area in lease TR5625H

Areas of high conservation value were recorded in the following leases.
Hill 781 an Hill 979 in lease TR5615H
Upland 3 and the Ravines in Uplands 1 and 3 in lease TR5618H

INTRODUCTION:

Rational.

As part of a rationalisation program for exploration leases within Karijni National Park (KNP) a survey was conducted to document areas of high conservation value within the exploration leases. The survey was conducted in late December 1994 and comprised three components.

Identification component.

A number of sources were used to identify potential areas of high conservation value within and adjacent to Hamersley's exploration leases .

1/ Literature documenting the national park's important vegetation types fauna and geological features (see references for the relevant reports).

2/ Interviews were also conducted with Drs Tony Start, Stephen Van Leeuwen and Peter Kendrick (all from CALM). All three have a detailed knowledge of KNP.

Survey component.

The second phase of the project involved the physical documentation of the conservation areas by ground and aerial survey.

Ranking of Conservation Areas.

In the final phase conservation areas recorded during the survey were ranked and mapped.

AREAS OF HIGH CONSERVATION VALUE WITHIN KNP:

Background.

The large area of the Karijini National Park (KNP) means that it contains a representative sample of many of the geological types, plant and animal communities and landscape forms of the central portion of the Hamersley Range (Sandell, *et al.*, 1974; Chevis, *et al.*, 1994). KNP is important as it represents the transition zone between two types of vegetation communities. Mulga dominated vegetation to the South of latitude 23° S and *Triodia Eucalyptus* dominated vegetation to the North. Flora associated with the Torresian

bioclimatic region can also be found within drainage lines and protected gorges in the park (Beard, 1975).

While it can be argued that the park as a whole has an inherently high conservation value (this fact is recognised in the original gazetting of the land as a national park), certain areas can be identified that can be deemed to be more important than the remainder of the park. A variety of factors associated with an area produce an increase in the areas conservation value. This may be due to an unusual topographic feature, the presence of rare flora and or fauna, or a vegetation community that is poorly represented in the region.

The gorges are the best known and perhaps most important features of KNP. Apart from their visual appeal the gorges represent important habitats for many species of plant and animals. The availability of free water together with the structural complexity (providing a variety of different micro habitats) of the gorges produces a high level of species diversity within the gorges.

In addition a number of specific vegetation types have been highlighted (from a number of independent sources) as having inherently high conservation value within KNP.

1/ Upland Areas.

These regions can be regarded as having a high level of species endemism. Additionally, some of the higher regions are fire safe and burn infrequently. As a consequence, the upland regions may act as refuges for fire intolerant species, such as *Callitris glaucophylla* (Cypress pine) and *Eucalyptus kingsmillii*.

2/ Cracking Clay Communities.

Vegetation communities on cracking clays are poorly represented within the park. These areas also have a high level of endemism associated with them. Many species within these communities are fire intolerant. Cracking clay communities are therefore very vulnerable to fire. Good examples of cracking clay communities can be found to the west of KNP in Hamersley station and the rail corridor east of Marandoo.

3/ Mulga Woodland Communities.

A number of different types of Mulga Woodland can be identified within KNP. While each community is dominated by *Acacia aneura*, the density of canopy cover and the species composition of the mid and under-storey varies considerably between different types of Mulga woodland. Three general classification types can be identified;

1. Mulga Woodland on low slopes at the base of hills.
2. Mulga Woodland on flat cracking clays with the hard pan close to the surface.
3. Mulga Woodland on flat cracking clays with a deep soil profile.

These woodlands are very sensitive to fire and grazing. Mulga Woodlands that have not been affected by fire or grazing are scarce within the KNP and warrant a high conservation value. It has been reported that since European settlement the frequency of burning in hummock grassland has been reduced but that fires, when they occur, have been more extensive than was previously the case (Bolton & Latz, 1978). These intense fires have carried into the Mulga woodlands with the result that they are now less extensive than the hummock grassland.

A large area of very good Mulga can be found to the South West of Juna downs homestead. This area is extensive extending as far as Mt Meharry. CALM have set up a number of permanent monitoring plots within this region and are very keen to have the area incorporated into the national park proper.

A high conservation value may also be imparted upon an area by the presence of rare and or endangered plant or animal species.

Rare Fauna.

KNP is known to contain two vertebrate species that are listed on schedule 1 of the endangered species list. The conservation status of an area could be affected by the presence of either the Pebble-Mound Mouse *Pseudomys chapmani* or the Pilbara Olive Python *Liasis olivaceus barroni.* A number of animal species within the park that, although not gazetted as rare, have declining populations, are now considered to be rare or

absent over much of their former range. The presence of these particular species within specific habitats could affect the conservation value of those areas. These species include;

Spectacled Hare Wallaby (*Largorchestes conspicillatus*)

Rothschild's Rock Wallaby (*Petrogale rothschildii*)

The Bilby (*Macrotis lagotis*)

Northern Brushtail Possum (*Trichosurus arnhemensis*)

Flora.

Discussions with CALM officers reinforced the view that Mulga Woodlands, Coolabah Flats and up-land communities have high conservation values within KNP. Having considerable local knowledge they were able to pinpoint a number of important sites onto 1:50 000 topographic maps. A rare species list was drawn up by Steve Van Leeuwen, the presence of many of these species in a area could significantly affect the conservation value of that area.

Rare species within KNP.

Acacia darwena	*A. effusa*
Brchychiton accumiatus	*Lepidium catapycuan*
Indigofera "georgei"	*I. "ixoccrpa"*
Eucalyptus pilbanensis	*E. ewartiana*
E. "lucasii"	*Thysanotus* sp. VHF Hill
Thysanotus sp. cf. *manglesianus*	*Thryptomene wittwerri*
Thryptomene sp. "Channar"	*Cryptandra "inanticola"*
Eremophila magnifica	*Geijera* sp.

Dr Start pointed out a number of specific cases that warrant a high conservation status. The first of these is an area known as the gap. This small valley is approximately 20 km south along the Juna Downs road from the Mt Bruce Juna Downs intersection. This area is unique as it contains a very high number of rare and endangered plant species.

Other areas of importance are the riparian systems along the river and creek banks. These areas often contain a large number of plant species that are normally associated with Torresian plant communities, and can be regarded as remnants of a period when the Pilbara

was much wetter. Permanent springs such as Milli Milli Spring Mindi Spring and Cotton Pool are also important for this reason.

Vegetation communities on top of unusual geological formations are also important as the vegetation is often quite different to the surrounding country.

CONSERVATION AREAS WITHIN LEASE BOUNDARIES:

TR5615H.

Located in the north western corner of KNP, the lease is very rugged comprising mostly upland areas. The only lowland area is a well defined water course, flood plain the runs diagonally through the lease. This habitat type occupies only a small portion of the lease area.

The south eastern portion of the lease contains a number of well defined gorges (centred around 616 000, 7534 500). All are well formed and topographically complex. As a result of the complex nature of the topography a high level of species (both flora and fauna) diversity can be expected at this site.

Two significant upland areas were located within the lease area (hill 781 and hill 979, both of which are located in the north west corner of the lease). Both of these hills have flat tops which are isolated from the surrounding hillside by steep cliffs. The steepness of the cliffs acts as a natural fire break.

The north eastern portion of the water course supports an extensive woodland of *E. coolabah* and *E. camaldulensis*. The density of trees is greatest around the lease's western boundary.

The remaining slopes and uplands within the lease are covered with a hummock grass land of *Triodia spp.* and emergent *Eucalyptus* spp.and *Acacia spp.*

TR5617H.

Located close to the central western boundary of KNP this is a small lease with an extensive upland area covering the northern half of the lease. The most significant features of the lease are two small patches of mulga woodland. The first of these runs along a prominent ridge line in the center of the lease (606 000, 7518 000). The second patch of mulga is located on a rocky slope in the western end of the lease (605 000, 7518 000). While both of these stands are small and isolated they appear to be relatively undisturbed.

TR5618H.

This large lease is located on the central western boundary of KNP. The north eastern portion of the lease contains an extensive upland region. The terrain in this area is very rugged with a large number of ravines and ridge lines. The survey did not identify anyspecific vegetation communities in this area. The complex nature of the topography in this area may necessitate the need for a more intensive survey in this region. These surveys would be aimed primarily at determining if rare plant species are found in these areas. A small stand of Mulga woodland is situated on a hill side in the southern section of the lease (609 500, 7511 250). This small isolated stand would generally be regarded as having limited conservation value.

TR5619H.

This is a large lease located approximately 5 km north of the Marandoo lease area. Three prominent upland areas are located within the lease. The first is situated in the south western portion of the lease (centred at 620 000, 7512 500), the second can be found in the north east of the lease (centred at 622 000, 7517 000), the final upland area is located within the eastern arm of the lease (centred at 622 000, 7514 000). The remained of the lease is made up of small rolling hills or alluvial flood plains.

The north western face of the southern most upland is incised with a large number of ravines. These ravines appear to be relatively fire safe, as a consequence they contain stands of the fire sensitive species *Callitrius glaucophylla* and *Acacia aneura*. *Eucalyptus kingsmilli* may also be found in this area.

A large ravine was located (623 500, 7515 000) within the eastern upland area. The walls and floor of the ravine provide a habitat for dense stands of *C. glaucophylla*, *A. aneura* and several Eucalyptus species.

The slopes and low land areas of the lease are covered by a hummock grassland vegetation. A small lowland Mulga (*A. anurea*) woodland was located in the central west of the lease (618 000, 7515 000). However this stand appeared to be heavily degraded and therefore of low conservation value.

TR5620H.

This is a large lease located near the center of KNP. A large U shaped ridge line is situated within the center of the lease. These uplands feed a large drainage basin that exits at the lease's south eastern corner. An aerial survey of the remainder of the lease revealed that it was dominated by the hummock grassland comunity that is typical of this part of the Pilbara.

One small area of interest was located in the north eastern portion of the park (635 700, 7508 500). The vegetation community in this area differed from others in KNP in that it was dominated by *(Twin Leaf Bloodwoods)????*.

It should be noted that the northern boundary of this lease abuts onto an extensive low land Mulga woodland.

TR5621H.

This lease is situated in the north east corner of the KNP. The southern boundary of the lease runs just north of and parallel to the Joffre Falls road. The lease contained a small stand of Mulga in it's south eastern corner. While in good condition the small size of the stand most likely lowers the stands conservation value. Pebble mounds were located on a region of low rolling hills in the center of the lease (647 500, 7514 500).

The Yampire Gorge road runs diagonally through the lease. Approximately 2.5 km before the northern boundary of the lease the road enters the start of Yampire road. The dense nature of the riparian communities within the gorge would act to increase the conservation value of this area.

The remained of the lease contains vegetation communities that are found throughout KNP.

TR5622H.

This lease is located just to the east of TR5621H . The northern portion of the lease contains an area of high conservation value. A large natural amphitheatre has been formed by three ridge lines in the north of the lease. An area of non degraded Mulga woodland is situated within the amphitheatre. The woodland is protected from fire by a 4WD track that circles the woodland. Two days prior to the survey a bush fire swept through the area. The effectiveness of the track as a fire break could clearly be seen from the air with charred ground running up to the track but not extending past it.

It should be noted that while the Mulga stand in this area is an important feature, the complex topography and high visual impact of the uplands to the north east and west of the mulga also contributes to the conservation level of the area.

TR5624H.

This lease is located to the East of the Marandoo iron ore project . The lease contains a number of areas with high conservation values. A number of rare plant species have been documented on the ridge lines in the north of the lease. These species include; *Eremophila* spp. (632 500, 7498 000), *Geigera* spp. (629 500, 7496 500), and *Eucalyptus pilbarensis* has been found on the summit of Mt Howieson.

The lease is also significant in that the eastern and western boundaries are bounded by extensive good quality Mulga /coolabah woodlands.

A large number of Aboriginal sites are also found within the northern section of this lease.

TR5625H.

This lease runs parallel to rail corridor south east of Marandoo. The valley region known as the Gap is situated at the eastern end of the lease. The vegetation in this area has been well documented and is known to be extremely species rich. *Acacia dawena* and *A. effusa* are found in this habitat (both are listed by CALM as rare species). What is thought to be a new Lepidium species has been found approximately 2 km west south west of the gap.

A prominent ridge line extends almost completely along the southern boundary of the lease. These ridges have very step sides and possibly offer plant species that grow on the upland's protection from fire.

ML252SA.

This small rectangular lease is located on the eastern boundary of KNP. The area within the park is part of a much larger lease area located just outside the KNP boundary. The lease area within the park has a very high conservation value due to the presence of Dignam Gorge. This Gorge cuts the lease longitudinally into two. At the northern end of the lease Dignam Gorge feeds into the Dales Gorge system. The bottom of Dignam Gorge provides a habitat for a number of very dense stands of *Melaluca spp*. and River Red Gums (*E. camaldulensis*) and Coolibah (*E. coolabah*)

E47/631.

This is a small lease Located on Eastern boundary of KNP. No areas of significance were located within this lease.

E47/487.

No areas of high conservation value were located in these area.

AE47/579.

No areas of high conservation value were located in these area.

AE47/580.

No areas of high conservation value were located in these area.

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Put on TR numbers