The New Newman-Port Hedland National Highway
(Newman to Munjina Section)

An assessment of impact on native fauna.

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INTRODUCTION

Recent surveys in the eastern Pilbara have recorded 135 bird, 23 small mammals and 92 reptile and amphibian species. The reptile and mammal fauna are diverse by comparison with southern, coastal and eastern central parts of the state and contain many locally endemic species.

In order to assess the impact of the planned National Highway through the region on the wildlife, an inspection was made of the proposed route. This took place from 14th to 19th November, 1982 along a section of the route extending from Newman to Munjina Gorge.

During the inspection it was of course not possible to confirm the prescence or absence on the route of most of the regions wildlife. Instead an effort was made to assess the habitats through which the route passed and which might be affected by road construction. The probable fauna of these habitats was extrapolated from detailed biological surveys carried out elsewhere in the region (Dunlop & Pound 1981, Dunlop & Sawle 1982 and in press, Johnstone, 1982 a & b). In Table 1 the major vegetation units of the eastern Pilbara are described in relation to landform, drainage and substrate or soil type. Table 2 records the occurrence of these 27 vegetation units or habitat types along the proposed route which is divided into 5 sections;

Opthalmia area	- Newman to Rhodes Ridge.
Mt. Robinson	- Rhodes Ridge to Packsaddle.
Packsaddle north	- From Packsaddle to the Marillana flats.
Marillana Flats	- Munjina claypan area, to gorge bridge site on branch of the Marillana.
Munjina Gorge	- From gorge on Marillana to Wittenoon - Roy Hill road through Munjina Gorge.

A vegetation map and an estimate of the areas involved will be produced from the more detailed studies to follow.

An attempt was also made to identify any special features along the route which may be of importance to wildlife.

ASSESSMENT

Over much of its length the section of the route between Newman and Munjina passes through hummock grasslands dominated by Triodia basedowii and T. wiseana on the foothills and through scrub and woodland dominated by Mulga Acacia aneura on the valley floors. Much of the vegetation between Packsaddle and Munjina gorge had been recently burnt at the time of the inspection so the climax state of the vegetation was inferred from landform and remnant stands.

The Mulga woodland on the Marillana flats is already showing signs of degeneration due to exposure to fire and grazing.

It is not pertinent here to detail in full the vertebrate faunas of the two broad habitat types traversed by the route. The birds of the region are extremely mobile and the ecological tolerances of the reptiles are wide and related primarily to substrate type. In neither case is the road likely to have significant impact on species populations. The group most likely to be affected by any habitat alteration associated with the road are the small ground living animals, an assemblage of native rodents and marsupial mice.

The hummock grasslands of the lower slopes and foothills are the preferred habitats of three native small mammals which are restricted to the Pilbara. These are the Little Red Antechinus Antechinus rosamondae, Pilbara Ningaui Ningaui timealeyi and Pebble-mound Mouse Pseudomys chapmani. The Giant Planigale Planigale maculata is also present although generally scarce.

The Little Red Antechinus and Pilbara Ningaui are common marsupial mice in the area and there habitat occupies vast areas. Although they are unlikely to be affected directly by highway construction significant impacts at a population level could result from the indirect influences of the road in acting as a barrier and isolating pockets of habitat and in increasing fire frequency. These species are possibly susceptible to such changes because they are short lived and populations depend on the success of a single annual cohort of young.

Active nests of the Pebble-mound Mouse were observed throughout the section of the route, in hummock grassland on scree (gibber) slopes and foothills. This native rodent is unlikely to be significantly affected by road construction although some

areas with high densities of nests may also be attractive as borrow areas for building materials. If there are alternatives, areas with many 'pebble mounds' should not be mined.

The small mammal fauna of the valley floors includes the common Stripe-faced Dunnart Sminthopsis macroura and Sandy Inland Mouse Pseudomys hermannsburgensis neither of which are likely to be adversely affected by road construction. Another Dunnart Sminthopsis ooldea is presently known from only a few western australian specimens (Kitchener & Vicker 1981) but is quite common in Mulga near the Opthalmia range and in the Mt. Meharry area. Its northern limit seems to be the Mulga line as defined by Beard (1975). This species of unknown conservation status would be affected by any broad scale alteration to its Mulga habitat by any changes in drainage induced by the construction of a major road. The impact of grazing on this small mammal is unknown.

One specimen of Ingram's Planigale Planigale ingrami has been collected in the Pilbara. *This was trapped in dense bunch-grassland on cracking clay a micro-scale habitat interspersed with the mulga of the valley floors. No significant patches of this habitat were recorded along the route although the marsupial mouse may occur in similar grassland on the Munjina claypan. Ingram's Planigale and the Giant Planigale are classified by wildlife authorities as rare or otherwise endangered species in this state.

Special Features

There were few special features along this section of the route which would be of particular importance to wildlife populations. The stand of River Red Gums Eucaluptus camaldulensis at Cathedral Gorge may be of local importance to tree bat populations and to birds which nest in tree hollows. In the creek bed at the Marillana gorge bridge site are a number of long lasting pools which may be used as traditional drinking sites by kangaroos, native pigeons, cockatoos and monitor lizards. Care should be taken to maintain access to the water sources under the road and the road in the viscinity may need to be fenced to reduce the traffic hazards of wildlife crossing the road.

No caves of importance to wildlife populations were located along the proposed route.

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* Also from Opthalmia Range area.

CONCLUSION

The route of the new Newman-Port Hedland National Highway passes through an area of considerable value in terms of the wildlife which persists there. This is the first road of its size and standard in the eastern Pilbara. Although generally well located to avoid significant impact on animal populations the road could bring about detrimental changes in three ways by:

1) Forming a barrier isolating animals in relatively small pockets of habitat which may then be subject to habitat alteration.
2) By changing vegetation (habitat) patterns by altering the surface drainage.
3) By changing the fire frequency and burning patterns.

Changes in fire frequency are already becoming evident in the region as a result of mining settlement, pastoralism, mining exploration and tourism. This is becoming a matter of concern to ecologists with responsibilites in the area (eg. in the Hamersley Range National Park).

Methods of dealing with the National Highways potential affects on patterns of drainage and burning will it is hoped result from more detailed vegetation studies to follow. No further investigations dealing specifically with the fauna are required.

REFERENCES

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Kitchener & Vicker (1981). Catalogue of Modern Mammals in the Western Australian Museum 1895 - 1981. Western Australian Museum, Perth.

Table 1: The major vegetation units of the eastern Pilbara in relation to general landform and soil type. Vegetation description follows Muir (1977) for life form/density classes. A floristic code key is appended.

Table 1.

LANDFORM	SOIL TYPE	No.	CODE	VEGETATION UNIT DESCRIPTION
High ridges or hills	Outcrop soil skeletal	1	e_1KSi.t_1Hc	Eucalyptus kingsmilli open shrub mallee over mid-dense to open hummock grass.
* on protected slopes	"	2	kLBc	*Clumps of Callitris columellaris low forest A or B.
+ "	"	3	a_1Sc	+Thickets of Mulga Acacia aneura.
Low ridges or hills	"	4	e_2LBr.t_1Hc	Eucalyptus leucophloia open low woodland B over mid-dense Triodia wiseana or T. basedowii hummock grass.
	"	5	a_xSAi.t_1Hc	Acacia maitlandii, A. umbellata, A. kempeana, A. inequilatera scrub A over mid-dense Triodia wiseana hummock grass.
	"	6	t_2Hc	Mid-dense Triodia basedowii hummock grassland.
Scree slopes	Gibber with pockets of skeletal neutral soil.	7	a_xSi.t_2Hc	Acacia bivenosa, A. dictyophleba, A. rhodophloia, A. kempeana, A. inequilatera scrub over mid-dense Triodia wiseana or T. basedowii hummock grass.
	"	8	C_xSBi.t_2Hc	Cassia spp. low scrub B over Triodia basedowii mid-dense hummock grass.
	"	9	e_3KSi.t_2Hc	Eucalyptus gamophylla open shrub mallee over Triodia basedowii mid-dense hummock grass.
	"	10	a_xSDr.b_2Hc	Acacia hilliana and A. adoxa open dwarf scrub over Triodia basedowii or T. wiseana mid-dense hummock grass.

Table 1 cont..

LANDFORM	SOIL TYPE	No.	CODE	VEGETATION UNIT DESCRIPTION
Minor (1^{o} cycle) drainage + along upland drainage channels.	Shallow sandy soils, ph depending on local geology.	11	e_2LBr.x Si.t_3Hc	+Very open fringing woodland of Eucalyptus dichromophloia, E. leucophloia over mixed scrub including Grevillea wickhamii, Acacia maitlandia, A. tumida, A. dictyophleba, A. bivenosa ect. over Triodia pungens hummock grassland.
*Minor outwashes and channels at the base of hills and ridges.	Sandy loams of varing ph.	12	a_xSi.t_3Hd	*Open scrub or scrub of Acacia (A. tenuissina, A. ancistrocarpa, A. tumida, A. dictyophleba, A. inequilatera) over dense Triodia pungens or T. longiceps hummock grassland.
Valley Floor	Neutral to slightly acidic loam or sandy loam.	13	e_4LBr.t_5Hc	Very open woodland of Eucalyptus dichromophloia, Acacia pruinocarpa and Hakea suberea over Plectrachne schinzii mid-dense hummock grass.
	"	14	e_4LBr.t_3Hc	Very open to open woodland of Eucalyptus dichromophloia, Acacia pruinocarpa and Hakea suberea over Triodia pungens mid-dense hummock grass.
Outwash plains or run-on areas.	Neutral loams or clayey loams.	15	a_1Si.t_3Hc	+Mulga Acacia aneura scrub over mid-dense Triodia pungens hummock grass.
+Base of hills and ridges.	"	16	a_1LBc.xJr	*Mulga Acacia aneura low forest A or B over open herbs and bunch grasses. Grove & intergrove.
*Low intensity drainage runnels.	"	17	a_1LBi.g_xGLi	#Mulga Acacia aneura low woodland B over sparse bunch grassland (Grasses include
#Undefined drainage.				

Table 1 cont..

LANDFORM	SOIL TYPE	No.	CODE	VEGETATION UNIT DESCRIPTION
#undefined drainage cont.		17	a_1LBi.g_xGli	Themeda australis, Aristida spp., Enneapogon spp., Eragrostus spp., Perotis rara and Paraneurachne meulleri).
	Cracking clay soils	18	g_xGLd.	Dense low bunch-grassland.
	"	19	e_5LAi.g_xGLc	Eucalyptus coolabah low woodland A over low bunch grassland.
Calcrete and Dolomite Outcrops.	Outcropping rock, skeletal, basic soils.	20	t_4Hc	Mid-dense Triodia wiseana and T. longiceps hummock grassland.
Low hills and scree slopes.	Gibber & scree with skeletal basic soils	21	e_7KSi.t_4Hc	Eucalyptus oleosa, E. transcontinentalis open shrub mallee over Triodia longiceps T. wiseana mid-dense or dense hummock grassland.
Valley floors and stony pavements.	Shallow basic loams.	22	m_1SBi.t_4Hc.	Melaleuca eleutherostachya low scrub B over T. longiceps mid-dense hummock gras
Major Creeks Flood plains (Fortescue System)	Heavy gravel mixed with sandy loam. Often former channels.	23	a_2LBi.a_xSAi.t_3Hi	Atalaya hemiglauca, Acacia pruinocarpa low woodland B over mixed Acacia low scrub A over Triodia pungens hummock grassland.
Channels +Along channels *On sandy banks and islands.	Heavy gravel in stream bed sandy levee banks and islands.	24	e_6Mr .a_xSi.	+Eucalyptus camaldulensis woodland or open woodland Acacia (A. coriacea, A. citrinoviridis, A. Tumida) scrub or thicket.
	"	25	m_2Sc	*Thickets of Melaleuca glomerata.
Permanent water	"	26	m_3Mc	Fringing forest of Melaleuca leucodendron.

Table 2 - The status of 26 Vegetation units of the eastern Pilbara along the proposed route of the National Highway.

Habitat No.	Habitat Code.	Status of Habitats along the Route				
		Opthalmia area	Mt. Robinson area	Packsaddle north	Marillana flats	Munjina flats
1	e_1KSi.t_1Hc	-	-	-	-	-
2	kLBc	-	-	-	-	-
3	a_1Sc	-	-	-	-	-
4	e_2LBr.t_1Hc	w	w	w	+	w
5	a_xSAi.t_1Hc	+	+	+	-	+
6	t_2Hc	+	+	w	+	+
7	a_xSi.t_2Hc	w	w	w	+	+
8	c_xSBi.t_2Hc	+	+	+	+	-
9	e_3KSi.t_2Hc	w	w	w	w	+
10	a_xSDr.t_2Hc	+	+	w	w	+
11	e_2LBr.xSi.t_3Hc	+	+	+	+	+
12	a_xSi.t_3Hd	+	+	+	+	-
13	e_4LBr.T_5Hc	-	-	-	-	-
14	e_4LBr.t_3Hc	-	-	-	+	-
15	a_1Si.t_3Hc	+	+	+	w	-
16	a_1LBc.xJr	+	-	-	-	-
17	a_1LBi.g_xGLi	+	+	-	w	-
18	g_xGLd	+	-	-	-	-
19	e_5LAi.g_xGLc	-	+	-	+	-
20	t_4Hc	-	-	+	-	-
21	e_7KSi.t_4Hc	-	-	+	-	-

Table 2 cont.

Habitat No.	Habitat Code.	Status of Habitats along the route.				
		Opthalmia area	Mt. Robinson area	Packsaddle north	Marillana flats	Munjina flats
22	$m_1SBi.t_4Hc$	-	-	-	-	-
23	$a_2LBi.a_xSAi.t_3Hi$	-	-	-	-	w
24	$e_6Mr.a_xSi$	+	-	-	+	-
25	m_2Sc	-	-	-	-	-
26	m_3Mc	-	-	-	-	-

w widespread along section of route.

\+ present along section of route.

\- absent from section of route.

Floristic Code Used

e - Eucalypts

e_1 Eucalyptus kingsmilli
e_2 E. leucophloia
e_3 E. gamophylla
e_4 E. dichromophloia
e_5 E. coolabah
e_6 E. camaldulensis
e_7 E.oleosa
e_8 E. transcontinentalis
e_x Mixed Eucalypts

t - Hummock grass

t_1 Triodia wiseana
t_2 T. basedowii
t_3 T. pungens
t_4 T. longiceps
t_5 Plectrachne schinzii
t_x Mixed hummock grasses

a - Acacia

a_1 Acacia aneura
a_2 A. pruinocarpa
a_x Mixed Acacia

m - Melaleuca

m_1 Melaleuca eleutherostachya
m_2 M. glomerata
m_3 M. leucodendron

g_x - bunch grasses

x - mixed plant species

k - Callitris columellaris