

FLORA OF CONSERVATION SIGNIFICANCE SUPPLEMENTARY REPORT PROPOSED GRAVEL PITS



VICTORIA RIVER HIGHWAY UPGRADE TO IMPROVE FLOODING IMMUNITY PUBLIC ENVIRONMENTAL REPORT

**Prepared by Donna Lewis
Land and Vegetation Unit
Land and Water Division
Department of Natural Resources and the Arts
for Department of Planning and Infrastructure**

November 2006

SUMMARY

This document is supplementary to Flora of Conservation Significance, Victoria River Highway Upgrade to Improve Flooding Immunity Public Environmental Report (Lewis *et al.*, 2006) and Department of Natural Resources Environment and the Arts Victoria Highway Upgrade Public Environmental Report comments on species of particular conservation significance. Both documents recommend undertaking subsequent floristic survey in areas proposed for gravel and fill material extraction.

The floristic survey carried out in October 2006 across three areas proposed by Department of Planning and Infrastructure for gravel and fill material extraction, identified dominant vegetation communities and the likelihood of flora of conservation significance to potentially occur. Five check sites and 12 road notes were described over the three areas totalling 38.22km². Given the vast area, a helicopter was used to fly and gauge the extent of vegetation communities, therefore sampling was not intensive.

The likelihood of flora of conservation significance with IUCN Threatened and Non Threatened status occurring in the habitats identified from this survey is low. There is one species of concern, *Rhynchosia filiformis* a Northern Territory endemic with a Data Deficient IUCN Non Threatened status. The species has restricted distribution in the Northern Territory, although associated habitats in the region are extensive. One population (seven individuals) will potentially be cleared on Coolibah Plateau, although this population was previously not known, therefore will not have an impact on the current status of the species. Overall, the works proposed for gravel and fill material extraction are unlikely to have a significant impact on species and vegetation communities of conservation significance.

The floristic survey was satisfactory to make further comment on impacts on species and vegetation communities of conservation significance as a result of gravel and fill material extraction. Further floristic surveys are not required to fulfil recommendations outlined in the Victoria Highway Upgrade to Improve Flooding Immunity Public Environmental Report.

The clearing of native vegetation is compliant with NT Land Clearing Guidelines (DIPE, 2002). The Guidelines provide technical advice for planning and undertaking land clearing in the NT. Advice is provided for use by land owners, managers and developers on how to clear in a manner that will avoid/minimise adverse environmental impact.

ACKNOWLEDGEMENTS

Ian Cowie and Raelee Kerrigan from the Northern Territory Herbarium are acknowledged for commenting on species of conservation significance (IUCN Threatened and Non Threatened) current status. Dave Howe from Land and Water Division is thanked for providing comment on the entire content of this supplementary report.

CONTENTS

<i>SUMMARY</i>	/
<i>ACKNOWLEDGEMENTS</i>	/
<i>LIST OF FIGURES</i>	///
<i>LIST OF TABLES</i>	///
<i>LIST OF PLATES</i>	///
1.0 INTRODUCTION	1
2.0 OBJECTIVES	1
3.0 METHODOLOGY	2
4.0 RESULTS	4
5.0 CONCLUSION	13
<i>REFERENCES</i>	14
<i>APPENDICES</i>	15



LIST OF FIGURES

Figure 1. Location of proposed gravel and fill material extents.....	3
Figure 2. Location of check sites and road notes across three proposed areas for gravel and fill material extraction.....	8
Figure 3. Distribution of <i>Rhynchosia filiformis</i> in the vicinity of the proposed gravel and fill material extraction works and new collection of the species on Coolibah Plateau scree slope.....	12

LIST OF TABLES

Table 1. Dominant vegetation communities described at three proposed gravel and fill material locations.....	4
Table 2. List of species with conservation significance compliant with IUCN Red List Categories.....	9

LIST OF PLATES

Plate 1. Site 1F – Coolibah Plateau.....	15
Plate 2. Site 1RNc – <i>Rhynchosia filiformis</i>	15
Plate 3. <i>Rhynchosia filiformis</i>	16
Plate 4. Site 1RN – Little Italy.....	16
Plate 5. Site 2RN – Little Italy.....	17
Plate 6. Site 3RN – Little Italy.....	17
Plate 7. Site 4RN – Little Italy.....	18
Plate 8. Site 5RN – Little Italy.....	18
Plate 9. Site 6RN – Little Italy.....	19
Plate 10. Site 7RN – Stock Pile Holding Yard.....	19
Plate 11. Site 8RN – Little Italy.....	20
Plate 12. Site 9RN – Little Italy.....	20
Plate 13. Site 10RN – Little Italy.....	21
Plate 14. Site 11RN – Little Italy.....	21
Plate 15. Site 12RN – Little Italy.....	22
Plate 16. Site 2F.....	22
Plate 17. Site 3Fa.....	23
Plate 18. Site 3Fb.....	23
Plate 19. Site 3Fc.....	24
Plate 20. Site 4F.....	24
Plate 21. Site 5F.....	25

1.0 INTRODUCTION

Supplementary to the report by Lewis *et al.* (2006) and Department of Natural Resources Environment and the Arts (NRETA) Public Environmental Report (PER) comments for Victoria Highway Upgrade (CNR 263 19/07/2006) further floristic surveys were recommended in areas proposed for gravel extraction. Recommendations were made based on limited existing floristic and structural data to enable sound comment on potential impacts on flora of conservation significance.

The Department of Planning and Infrastructure (DPI) have identified three areas for potential gravel extraction to service the Victoria Highway Upgrade to Improve Flooding Immunity. NRETA have been commissioned to undertake an on site reconnaissance to identify vegetation communities to be impacted as a result of gravel extraction. The identification of these communities will assist in determining the need to undertake full floristic surveys to identify flora of conservation significance previously outlined in Lewis *et al* (2006).

2.0 OBJECTIVES

The two main objectives of the reconnaissance include:

1. Describe vegetation communities within each area proposed for gravel extraction as per Northern Territory Guidelines and Field Methodology for Vegetation Survey and Mapping (Brocklehurst *et al.*, in prep);
2. Determine if flora of conservation significance highlighted in Lewis *et al.* (2006) are likely to occur in those communities described, and
3. Make recommendations if further floristic sampling is required.



3.0 METHODOLOGY

FIELD SURVEY

The field survey was undertaken over three days (20-22nd October 2006). The survey firstly involved flying across three areas identified by DPI for potential gravel and fill material extraction to identify dominant vegetation communities likely to be cleared. A total of five check sites and 12 road note sites were described accessed by vehicle where possible and helicopter. Areas were not intensively sampled due to such large areas selected. The three areas assessed included (Fig 1):

- Coolibah Plateau - 8km²
- Little Italy - 30Km²;
- Stock Pile Holding Yard (Fitzroy Station) – 0.22 km²

Check sites included the following attributes as per Brocklehurst *et al.* (in prep):

- Geo-reference information;
- Dominant species for three strata;
- Cover values for all species;
- Heights for three dominant species in each strata;
- Structural Formation;
- Stratum Summary;
- Ground Cover;
- Growth Forms;
- Landform;
- Site disturbance, and
- Site Photos.

Road Note sites included the following attributes as per Brocklehurst *et al.* (in prep):

- Geo-reference information;
- Dominant species for two dominant strata;
- Structural Formation for two dominant strata, and
- Site Photos.

DESKTOP ASSESSMENT

From the information provided by Lewis *et al.* (2006) on flora of conservation significance, associated vegetation communities for each species identified with Threatened and Non Threatened Status (IUCN, 2001) were compared with the dominant vegetation communities and landforms described during field survey.

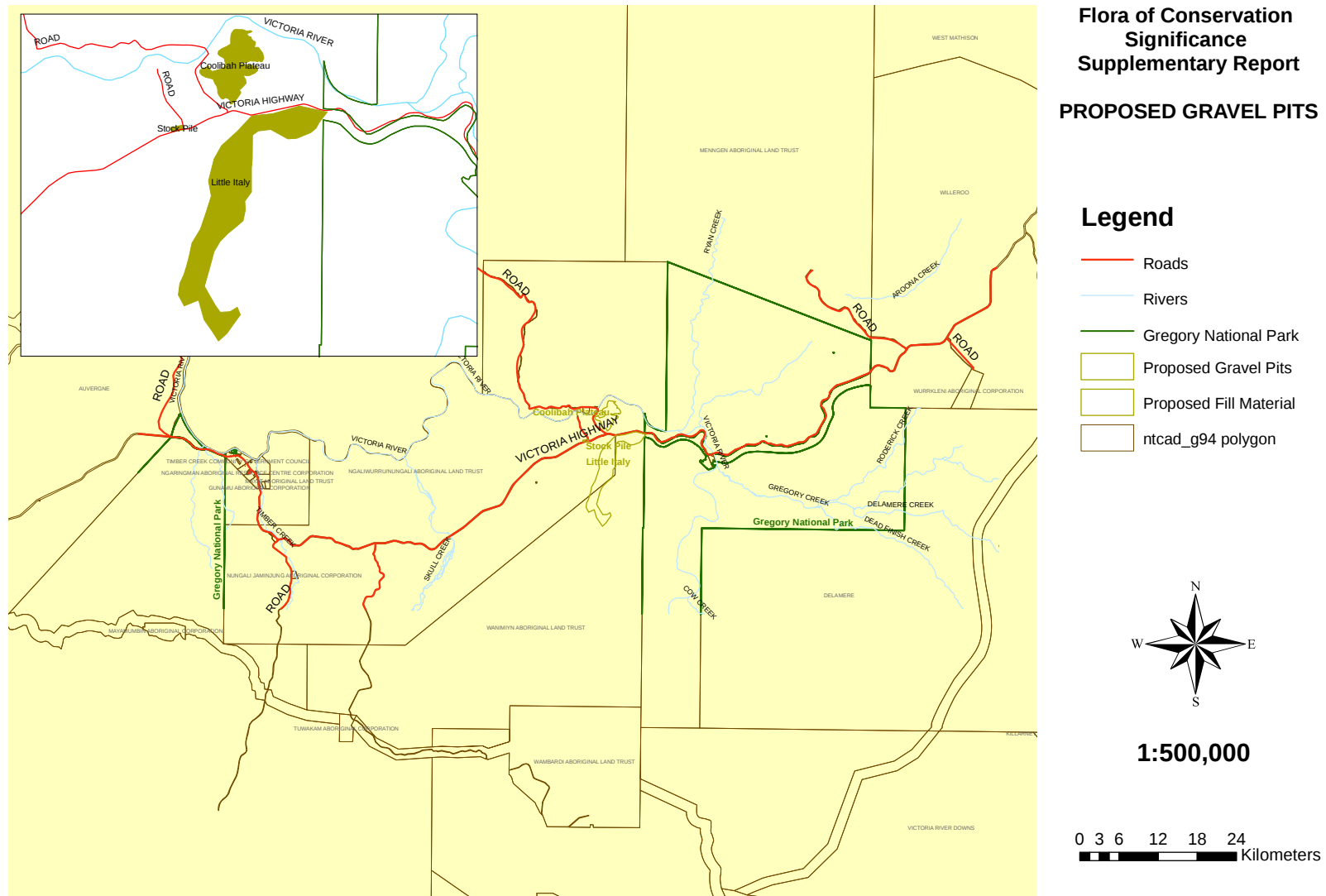


Figure 1. Location of proposed gravel and fill material extents.

4.0 RESULTS

Table 1 lists the dominant vegetation communities and landforms described across the three proposed gravel and fill material extraction areas including the following information:

- Site type (check site or road note);
- Location;
- Vegetation Community Description;
- Landform Pattern and Element (McDonald *et al.*, 1990);
- Latitude/Longitude;
- UTM M52, and
- Comments.

Refer to Appendix 1 for photo documentation of the sites listed in Table 1.

Table 1. Dominant vegetation communities described at three proposed gravel and fill material locations.

Site No.	Site Type	Location	Vegetation Community Description	Landform Pattern	Landform Element	Lat/Long GDA94	UTM M52	Comments
1F	Check	Coolibah Plateau	<i>Corymbia drysdalensis</i> , <i>C. ferruginea</i> and <i>Erythrophleum chlorostachys</i> low open woodland over <i>Triodia bitextura</i> and <i>Schizachyrium fragile</i> hummock grassland	Plateau	Plain	15 34.907 130 58.781	712281 8276339	This is the dominant community described on Coolibah Plateau. No flora of conservation significance are likely to occur.
1RNc	Road Note	Coolibah Plateau	<i>Eucalyptus tectifica</i> and <i>Bauhinia cunninghamii</i> low open woodland	Hill Slope	Hills	15 35.035 130 58.747	712218 8276101	On edge of access track to Coolabah Plateau on stabilised slope. <i>Rhynchosia filiformis</i> a data deficient spindly shrub to 1m was collected to voucher in the NT Herbarium. Status is Non Threatened although of concern. A few patches were identified.
1RN	Road Note	Little Italy	<i>Eucalyptus microtheca</i> , <i>Excoecaria parviflora</i> and <i>Bauhinia cunninghamii</i> low woodland	Plain	Drainage Depression	15 35.401 131 01.809	717685 8275379	A definite area to extract fill material. No flora of conservation significance are likely to occur.

2RN	Road Note	Little Italy	<i>Eucalyptus brevifolia</i> and <i>Melaleuca minutifolia</i> low sparse open woodland over <i>Triodia bitextura</i> hummock grassland	Plain	Foot Slope	15 35.981 131 01.514	717152 8274313	Potential area for fill material. No flora of conservation significance are likely to occur.
3RN	Road Note	Little Italy	<i>Eucalyptus tectifica</i> and <i>Terminalia canescens</i> low open woodland over <i>Sorghum</i> sp tussock grassland	Plain	Plain	15 35.941 131 00.712	715715 8274400	Potential area for fill material. No flora of conservation significance are likely to occur.
4RN	Road Note	Little Italy	<i>Eucalyptus brevifolia</i> low open woodland over <i>Sorghum</i> sp, <i>Sehima nervosum</i> and <i>Gossypium australe</i> tussock grassland	Plain	Plain	15 35.748 131 00.421	715200 8274758	Potential area for fill material. No flora of conservation significance are likely to occur.
5RN	Road Note	Little Italy	<i>Eucalyptus pruinosa</i> and <i>Erythrophleum chlorostachys</i> low open woodland over <i>Sehima nervosum</i> , <i>Aristida</i> sp and <i>Gossypium australe</i> tussock grassland	Plain	Plain	15 35.649 131 00.211	714826 8274945	Potential area for fill material. No flora of conservation significance are likely to occur.
6RN	Road Note	Little Italy	<i>Corymbia terminalis</i> , <i>Terminalia arostrata</i> and <i>Eucalyptus tectifica</i> open woodland with <i>Hakea arborescens</i> and <i>Acacia</i> sp over <i>Sehima nervosum</i> and <i>Dichanthium fecundum</i> tussock grassland	Plain	Plain	15 35.514 130 59.672	713864 8275205	Potential area for fill material. No flora of conservation significance are likely to occur.
7RN	Road Note	Stock Pile Holding Yard	<i>Eucalyptus tectifica</i> , <i>Bauhinia cunninghamii</i> and <i>Corymbia grandifolia</i> open woodland over <i>Themeda triandra</i> , <i>Sehima nervosum</i> , <i>Sorghum</i> sp and <i>Heteropogon contortus</i> tussock grassland	Plain	Plain	15 35.813 130 56.951	708993 8274698	Paddock proposed for stock piling fill material. No flora of conservation significance are likely to occur.
8RN	Road Note	Little Italy	<i>Eucalyptus pruinosa</i> low open woodland with <i>Cochlospermum fraseri</i> and <i>Acacia holosericea</i> over <i>Heteropogon contortus</i> and <i>Sehima nervosum</i> tussock grassland	Plain	Plain	15 35.517 130 58.686	712102 8275214	Potential area for fill material. No flora of conservation significance are likely to occur.

9RN	Road Note	Little Italy	<i>Corymbia terminalis</i> , <i>Eucalyptus tectifera</i> , <i>Corymbia confertiflora</i> and <i>Terminalia arostrata</i> low woodland with <i>Hakea arborescens</i> over <i>Heteropogon contortus</i> , <i>Sehima nervosum</i> , <i>Eriachne obtusa</i> tussock grassland	Plain	Plain	15 35.789 130 58.686	712096 8274714	Potential area for fill material. No flora of conservation significance are likely to occur.
10RN	Road Note	Little Italy	<i>Eucalyptus tectifera</i> low woodland with <i>Hakea arborescens</i> , <i>Acacia holosericea</i> and <i>Carissa lanceolata</i> over <i>Sehima nervosum</i> and <i>Heteropogon contortus</i> tussock grassland	Plain	Plain	15 36 24.4 130 58 44.4	712180 8273575	Potential area for fill material. No flora of conservation significance are likely to occur.
11RN	Road Note	Little Italy	<i>Melaleuca minutifolia</i> and <i>Eucalyptus brevifolia</i> low open woodland with <i>Carissa lanceolata</i> over <i>Heteropogon contortus</i> , <i>Chrysopogon fallax</i> , <i>Eriachne obtusa</i> , <i>Aristida sp</i> and <i>Corchorus sidoides</i> tussock grassland	Plain	Plain	15 36 42.6 130 58 46.7	712244 8273014	Potential area for fill material. No flora of conservation significance are likely to occur.
12RN	Road Note	Little Italy	<i>Eucalyptus pruinosa</i> , <i>Terminalia platyptera</i> , <i>Erythrophleum chlorostachys</i> and <i>Eucalyptus tectifera</i> low open woodland with <i>Terminalia canescens</i> over <i>Eriachne obtusa</i> , <i>Chrysopogon fallax</i> and <i>Sorghum plumosum</i> tussock grassland	Plain	Plain	15 37 03.0 130 58 49.1	712310 8272386	Potential area for fill material. No flora of conservation significance are likely to occur.
2F	Check	Little Italy	<i>Eucalyptus brevifolia</i> and <i>Melaleuca minutifolia</i> low open woodland over <i>Sehima nervosum</i> and <i>Eriachne obtusa</i> tussock grassland	Plain	Foot Slope	15 37 35.4 130 59 18.0	713164 8271383	Potential area for fill material. No flora of conservation significance are likely to occur.
3Fa	Check	Little Italy	<i>Corymbia drysdalensis</i> , <i>C. ferruginea</i> and <i>Owenia vernicosa</i> low woodland with <i>Terminalia canescens</i> and <i>Cochlospermum fraseri</i> over <i>Sorghum sp</i> , <i>Aristida sp</i> and <i>Schizachyrium fragile</i> tussock grassland	Plain	Plain	15 40 10.8 130 57 40.4	710210 8266631	Potential area for fill material. No flora of conservation significance are likely to occur.

3Fb	Check	Little Italy	<i>Melaleuca viridiflora</i> low open woodland over <i>Fimbristylis spp</i> closed sedgeland	Plain	Plain	15 40 10.4 130 57 38.1	710141 8266644	Potential area for fill material. No flora of conservation significance are likely to occur.
3Fc	Check	Little Italy	<i>Corymbia polycarpa</i> with <i>Eucalyptus pruinosa</i> open woodland over <i>Chrysopogon fallax</i> tussock grassland	Plain	Plain	15 40 07.4 130 57 34.7	710041 8266737	Potential area for fill material. No flora of conservation significance are likely to occur.
4F	Check	Little Italy	<i>Eucalyptus brevifolia</i> and <i>Melaleuca minutifolia</i> low open woodland over <i>Sehima nervosum</i> <i>Sorghum sp</i> and <i>Eriachne obtusa</i> tussock grassland	Plain	Foot Slope	15 39 17.6 130 58 39.2	711978 8268249	Potential area for fill material. No flora of conservation significance are likely to occur.
5F	Check	Little Italy	<i>Eucalyptus brevifolia</i> with <i>Corymbia terminalis</i> and <i>Eucalyptus tectifera</i> low woodland over <i>Sehima nervosum</i> tussock grassland	Plain	Plain	15 36 39.6 130 59 13.1	713033 8273098	Potential area for fill material. No flora of conservation significance are likely to occur.

Figure 2 illustrates the locations of check sites and road notes including proposed gravel and fill material extents.

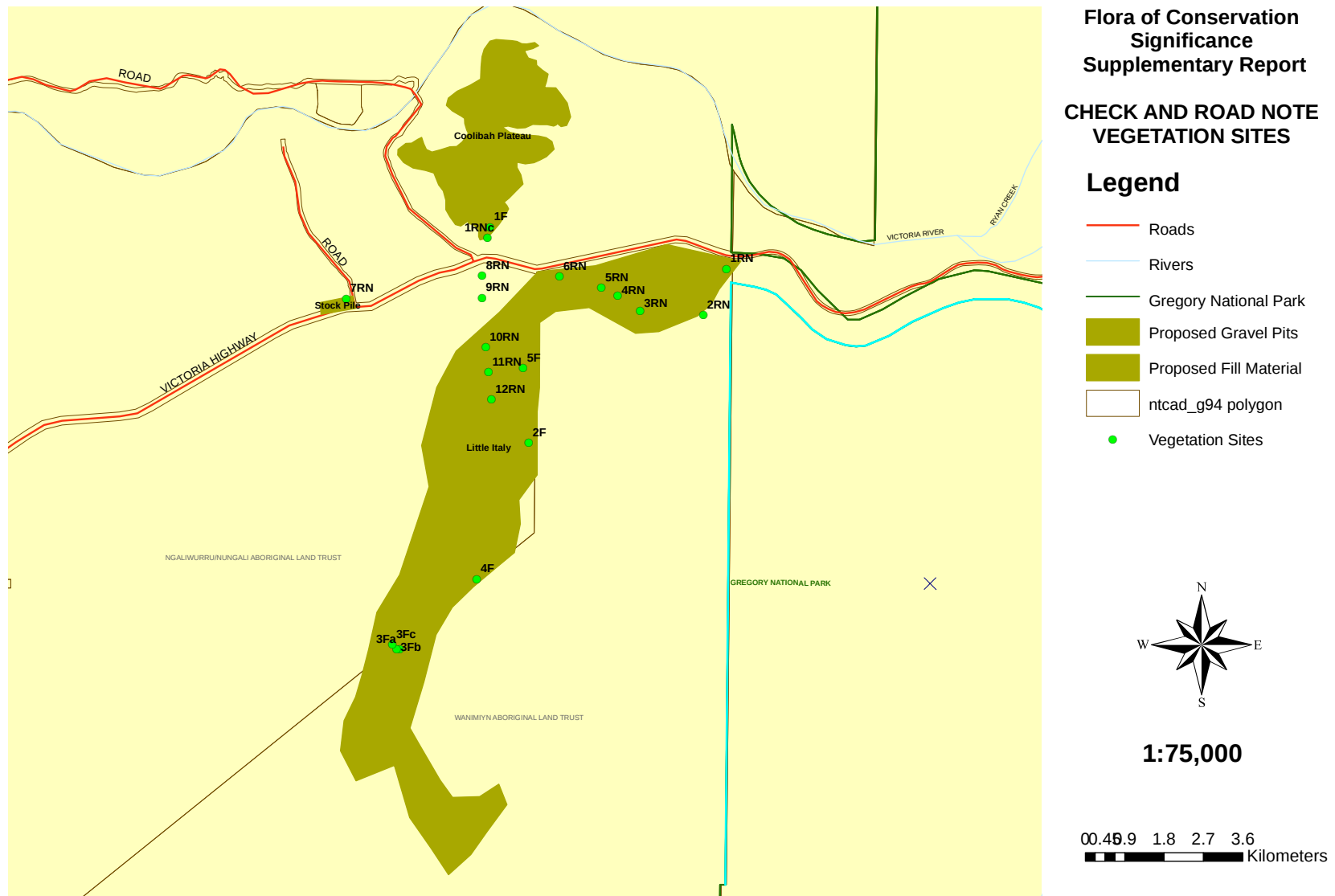


Figure 2. Location of check sites and road notes across three proposed areas for gravel and fill material extraction.

From a database search (Lewis *et al.*, 2006) a total of 13 species with IUCN Threatened and Non Threatened status were identified (Table 2). Supplementary information is incorporated including:

- Growth Form;
- Records from Northern Territory (NT) Herbarium Holtze specimen database;
- Associated vegetation, and
- Habitat and comments.

Refer to Appendix 2 for IUCN Red List Categories Threatened and Non Threatened status.

Table 2. List of species with conservation significance compliant with IUCN Red List Categories.

Taxon Name	Proposed IUCN Category 2005	NT Endemic	Growth Form	Records	Associated Vegetation	Habitat & Comments
ADIANTACEAE <i>Adiantum capillus-veneris</i> L.	V	no	Fern	3 records in NT (Jasper Gorge & Gregory National Park).	<i>Syzygium angophoroides</i> , <i>Dicranopteris</i> and other ferns.	Springs at base of sandstone cliffs on hills and rocky soil. Restricted distribution in the NT.
AMARANTHACEAE <i>Gomphrena leptoclada</i> subsp. <i>saxosa</i> Benth. J.Palmer	DD	no	Annual Herb to 15cm Low plant with reddish stems and white heads	4 records in NT (Waterloo Station, Gregory National Park)	<i>Eucalyptus brevifolia</i> and <i>Triodia</i> spp. <i>Eucalyptus tectifera</i> open woodland.	Shrubland and woodland on sandstone hills; skeletal sandy soil. Recorded locality for Victoria River is not accurate although species is widespread in Victoria River District; needs further survey work to determine status.
FABACEAE <i>Crotalaria novae-hollandiae</i> subsp. <i>novae-hollandiae</i> DC.	DD	no		63 records in NT (Victoria River District, Gregory National Park, Gulf, Daly Basin)	<i>Eucalyptus microtheca</i> , <i>Terminalia arostrata</i> , <i>Corymbia terminalis</i> .	Alluvial Plains. Woodland, clayey soils; much material was not determined to subspecies level at the time of re-evaluation although is now known to be widespread and common in the NT.

FABACEAE <i>Isotropis</i> sp. Joe Creek (J.L.Egan 4915)	NT	yes	Small slender shrub to 1m, spindly erect. Foliage soft, thin vivid green. Flowers sparse bright yellow. Pod green with tinge of black on top surface.	12 records in NT (Gregory National Park – Joe Crk and Victoria River Gorge).	Scattered patches under <i>Livistona</i> D10991 and <i>Xanthostemon</i>	Stabilised scree slopes below cliffs of sandstone escarpment - shaded areas or creek lines or seepage. Restricted distribution in NT.
FABACEAE <i>Rhynchosia filiformis</i> Maesen	DD	yes	Shrub perennial to 1.5m, spindly, aromatic. Flowers yellow with red venation.	13 records in NT (Gregory National Park – Joe Creek, Yambarran Range).	<i>Xanthostemon paradoxus</i> , <i>Eucalyptus phoenicea</i>	Edge of escarpment, scree slopes below cliffs. Restricted distribution in the NT.
FABACEAE <i>Rhynchosia rhomboidea</i> F.Muell. ex Benth.	NT	no	Sticky twinning vine, small scrambling shrub. Flowers yellow, pod green with red markings	7 records in NT (Victoria River Downs, Gregory National Park, Mistake Creek Station)	Rocky moist creek lines. Open woodland of <i>Eucalyptus</i> and <i>Bauhinia</i> over <i>Sehima nervosa</i> , <i>Chrysopogon</i> and <i>Heteropogon</i>	Stabilised scree slopes below cliffs; populations dispersed but uncommon in the NT.
GLEICHENIACEAE <i>Gleichenia</i> sp. Victoria River (I.D.Cowie 9193)	V	?	Fern perennial to 50cm	6 records in NT (Gregory National Park – Victoria River Gorge, Delamere Station)	<i>Dicranopteris linearis</i> , <i>Melaleuca triumphalis</i> and <i>Stenostegia congesta</i> . <i>Syzygium eucalyptoides</i> , <i>Melastoma</i> .	Springs at base of sandstone cliffs; overhangs on drip lines. Restricted distribution in NT.
MIMOSACEAE <i>Acacia chisholmii</i> F.M.Bailey	NT	no	Shrub with minni-ritchi bark to 3m	3 records in NT (1 Victoria River)		Woodland or open woodland on rocky or sandy soils; locality very general, accurate geocode not available, not relocated despite extensive survey in area in 2001.
MYRTACEAE <i>Melaleuca triumphalis</i> Craven	NT	yes	Multi-stemmed shrub bushy to 2.5m. Fissured bark sub papery. Foliage silvery, new growth very hairy. Flowers green.	12 records in NT (Gregory National Park – Victoria River Gorge)	<i>Eucalyptus brachyandra</i> , <i>Dicranopteris linearis</i> , <i>Baeckea</i> , <i>Ficus</i> sp.	Springs at base of sandstone cliffs. Restricted distribution in the NT.

MYRTACEAE <i>Stenostegia congesta</i> A.R.Bean	NT	yes	Multi-stemmed weeping shrub to 2-4m. Bark red brown fissured/fibrous and furrowed in older shrubs. Flowers are white and cup shaped.	12 records in NT (Gregory National Park – Victoria River Roadhouse, Victoria River Gorge, Delamere Station)	Syzygium angophoroides, Xanthostemon psidioides, Dicranopteris linearis, Lycopodiella cernua, Melaleuca sp; Eucalyptus aspera.	Springs at base of sandstone cliffs. Restricted distribution in the NT.
POLYGALACEAE <i>Polygala sp. (ciliate alae)</i> (C.R.Michell 615)	DD	yes		No records on Holtze		Stabilised scree slopes below cliffs; relatively widespread in drier parts of the monsoonal zone of the NT; needs further work to determine taxonomic and ecological status.
PTERIDACEAE <i>Pteris vittata</i> L.	DD	no	Fern to 1.5m	2 records in NT (Gregory National Park, Fitzmaurice River)	<i>Syzygium angophoroides</i> , <i>Dicranopteris</i> and other ferns.	Springs at base of sandstone cliffs. Restricted distribution in the NT.
RUBIACEAE <i>Dentella minutissima</i> C.T.White & W.D.Francis	NT	no	Prostrate herb forming mats. Foliage becoming grey purple above, moist and green below.	12 records in NT (only 1 at Victoria River crossing and Mittebah Station)	<i>Bergia pedicellaris</i>	Clay soils near watercourses or waterholes; recorded locality for Victoria River is not accurate although the species is widespread in drier parts of the monsoonal zone of the NT.

The areas proposed for gravel and fill material extraction do not occur in vegetation communities where species of conservation significance are likely to inhabit. However, if sections of Coolibah Plateau are to be cleared for fill material, the access track is to be widened. The widening of the access track will destroy a small population of *Rhynchosia filiformis*, an NT endemic and Data Deficient species. The species has restricted distribution in the NT, although has a significant amount of associated habitat in the region (i.e. stabilised scree slopes; Fig. 3).

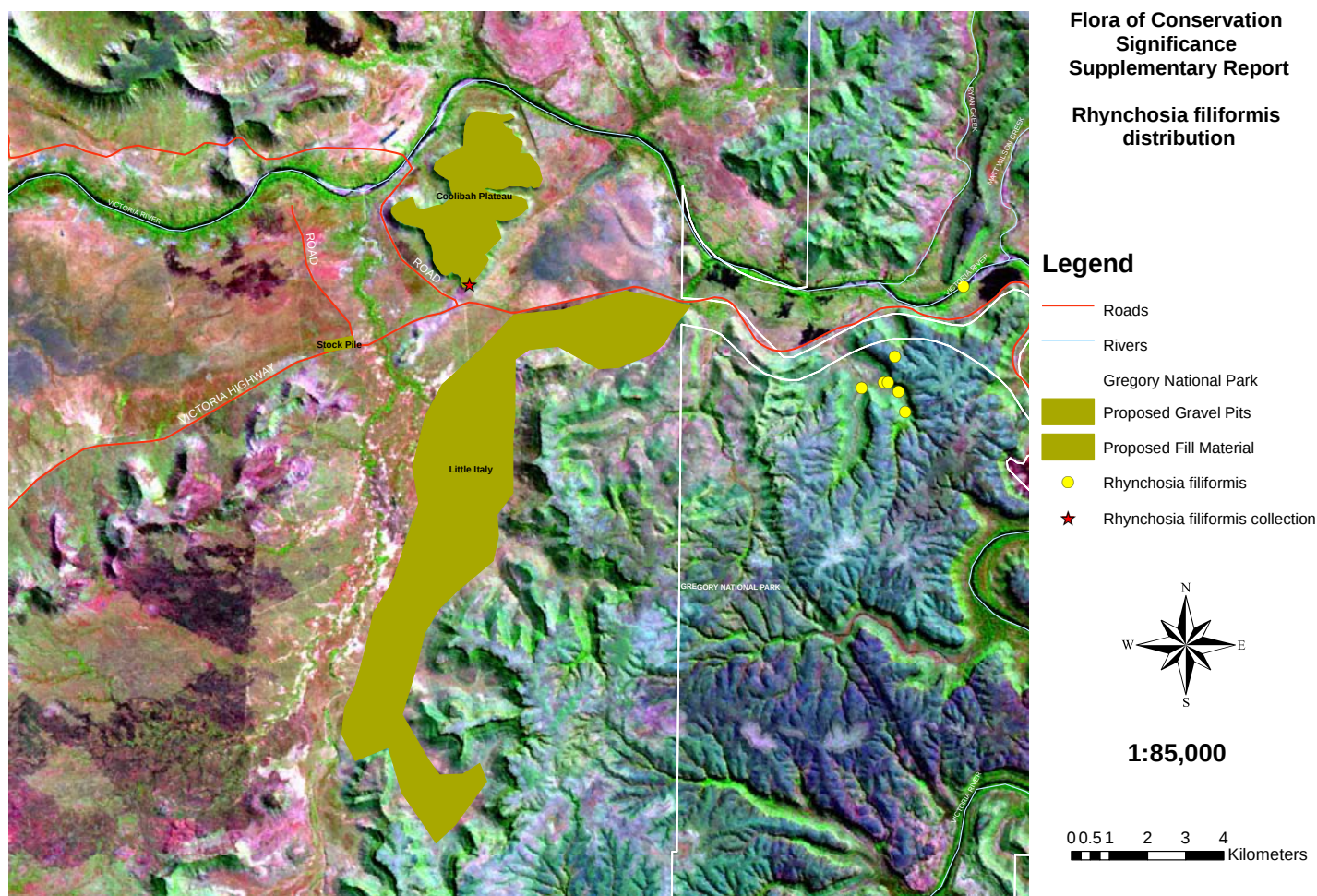


Figure 3. Distribution of *Rhynchosia filiformis* in the vicinity of the proposed gravel and fill material extraction works and new collection of the species on Coolibah Plateau scree slope.