BOTANICAL SURVEY OF TUSSOCK GRASSLANDS

WITHIN THE CENTRAL HAMERSLEY RANGE (N95/050)

Progress Report 1

Prepared by: *Stephen van Leeuwen*

Date: *November 1996*

TITLE OF PROJECT:

Botanical Survey of Tussock Grasslands within the Central Hamersley Range

AGENCY:

Western Australian Department of Conservation and Land Management (CALM) - Science and Information Division.

PROJECT SUPERVISOR:

Mr Stephen van Leeuwen
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PROJECT OFFICERS:

1. Mr Stephen van Leeuwen
   Research Scientist

2. Mr Robert Bromilow
   Technical Officer

AIM OF PROPOSAL:

To undertake a botanical survey of the Tussock Grassland communities found on valley floors within the Central Hamersley Range. This survey will then enable an assessment of the nature conservation values of such grasslands and their constituent species and facilitate the quantitative assessment of their representativeness and the adequacy of the existing reserve system.

SCOPE OF PROPOSAL:

a. Identify grassland assemblages within the study area through aerial photographic interpretation, satellite imagery and subsequent field inspections.

b. Establish and sample each of the assemblages via the use of permanent quadrats, supplementing flora collections with random sampling. Information recorded for each permanent quadrat will include landform unit, soil type, species presence and type of vegetation associations encountered.

c. Quantitatively analyse plant assemblage and vegetation association data, discussing patterns of community structure, species richness, species turnover and distribution. Prepare descriptions on the vegetation associations present and map their distribution. Undertake supplementary sampling.

d. Publish survey results and subsequent data analysis. Discuss implications of results with reference to conservation values and regional representativeness of the Karijini National Park and biological importance

of the Central Hamersley Range Tussock Grasslands. Make recommendations for management and reservation where appropriate.

WORK COMPLETED

Work completed on this project since its commencement in July, for each of the four scope items, is outlined below.

Scope Item A

The identification of Tussock Grassland communities within the Central Hamersley Range has been completed. A total of 84 individual grassland assemblages, totalling 471 km^2, were identified through the interrogation of signature patterns from Landsat imagery and aerial photographic interpretation (Figure 1). Ground truthing of some locations has occurred verifying pattern identified in Landsat and aerial photographic investigations. Further field work is, however, required to confirm the location and correct identification of all sites.

The majority (55) of the communities located were less than 1 km^2. The average size of the identified communities was 5.61 ± 14.75 km^2 with the largest being 89.87 km^2 while the smallest was only 0.05 km^2. The median size for the communities was 1.01 km^2. The largest Tussock Grassland community was located in the Wanna Munna Flats area (23° 11`S, 119° 13`E) while the second largest was on Munjina Claypan (22° 34`S, 118° 42'E).

The Karijini National Park contains 10 Tussock Grassland sites representing only 16% of the area identified for this community type within the project area. Forty five communities are located within the proposed Mulga Woodlands conservation reserve which represents 38.6% of this community type within the project area.

Scope Item B

Ten permanent benchmark flora sampling sites have been established (Figure 1). These benchmark quadrats comply with CALM's Pilbara biogeographical survey protocol and are identical to biological survey sites established at other location within the Pilbara, such as those in the Barlee Range Nature Reserve and on the Burrup Peninsula.

The flora at six of these Tussock Grassland sites has been samples on two occasions. The flora at the remaining sites has not yet been examined. Failure to sample the remaining four sites and to establish further survey sites on other Tussock Grasslands is attributable to poor conditions in the Central Hamersley Range at present. Insufficient rainfall during the 1995/96 summer and unsatisfactory winter rainfall have left many of these Tussock Grasslands in a barren and impoverished state. The Project Supervisor believes that sampling the flora in the remaining four established benchmark quadrats and the establishment of quadrats elsewhere would be a waste of finite resources (time and money). The Project Supervisor believes that

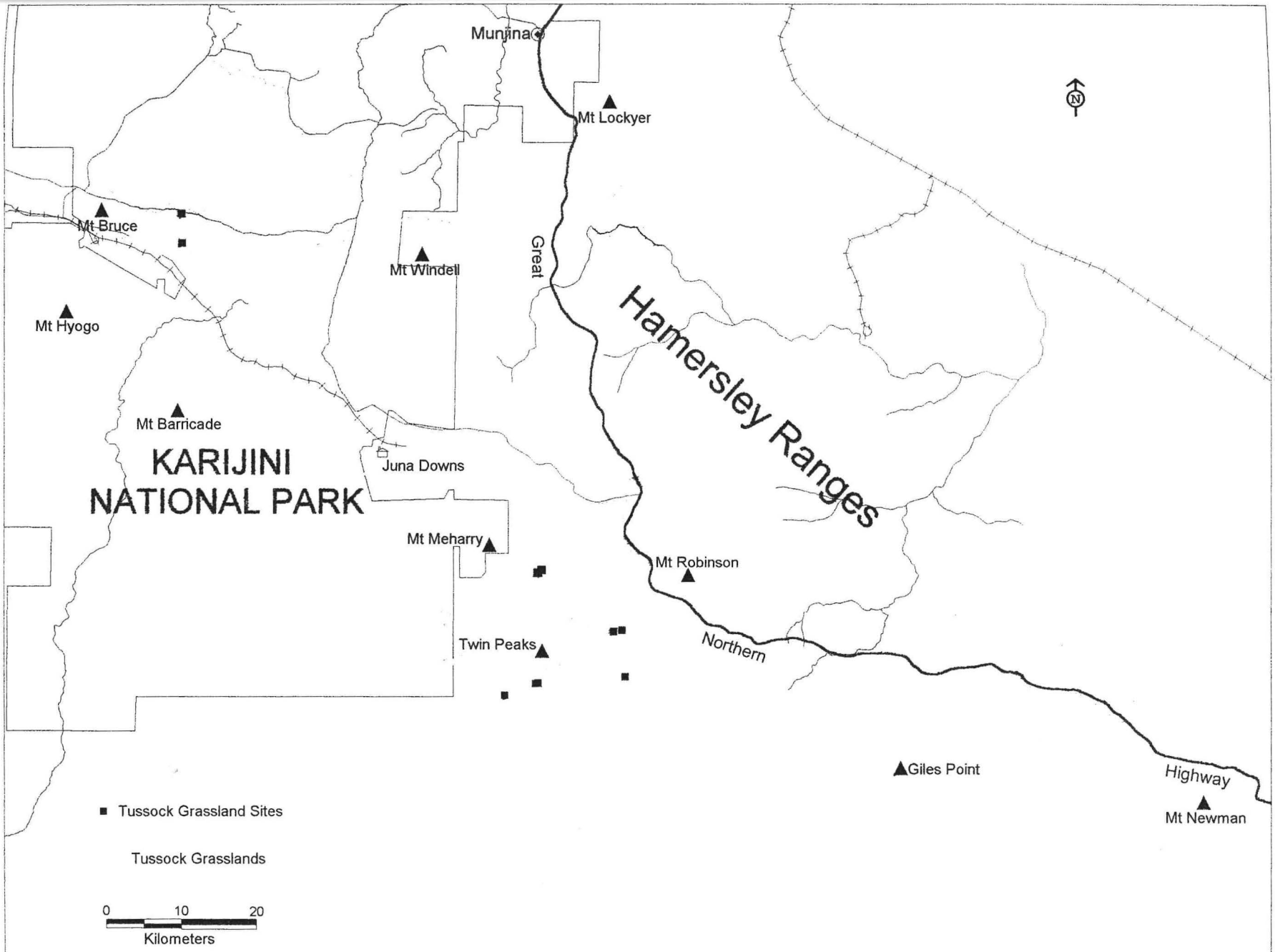

Figure 1 Location of Tussock Grasslands within the Central Hamersley Range.

quadrats established under the current environmental/climatic regime prevailing in the Central Hamersley Range would not fulfil the projects primary object of obtaining adequate information to facilitate quantitative assessments of the nature conservation value and biogeographical representativeness of these Tussock Grassland communities.

Protocols have been established for the collection of soil samples and delineation of landform units present within each Tussock Grassland community sampled.

Scope Item C

No qualitative analysis of plant specimen or vegetation association data has been undertaken. The failure to undertake these analyses can be attributed to the project's infancy and the small specimen data set currently available.

A total of 152 taxa representing 34 families and at least 70 genera have been identified from within the six sampled benchmark quadrats. These plants are listed in Appendix One. No assessment on the conservation significance of these taxa has yet been made as many have only been tentatively identified and further taxonomic investigation is required. Laboratory research will continues on the identification of these specimens and their databasing and incorporation into the Western Australian and Pilbara Regional herbariums.

Development of GIS and specimen databases will continue as new themes and specimen data become available.

Scope Item D

No progress has been made with the publication of survey results or subsequent data analyses.

The next progress report will be submitted at the end of January 1997.

EXPENDITURE TO DATE

An expenditure statement from the Administration Assistant in the Pilbara Regional Office is attached as Appendix Two. As of the 31st October a total of $690 or 2.0% of the $34 100 NEGP budget for this project had been consumed.

Expenditure since the commencement of the project has been entirely related to the purchase of materials, in particular topographical maps and supplementary digitising software. Outstanding charges associated with the purchase of Landsat imagery have not yet been debited against this project. Similarly travel and plant hire costs associated with field work undertaken as part of this project are still outstanding.

During the remainder of 1996 it is anticipated that the majority of expenditure, which will be minimal, will be associated with the purchase of materials and consumables for plant specimen processing. Funds will also be allocated to the purchase, in digital format, of Beard's 1:250 000 Pilbara vegetation map data for the project area. This GIS data will assist with the verification of identified Tussock Grassland sites and may lead to the identification of additional locations.

A cost overrun in the budget for this project is not anticipated.

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APPENDIX ONE

Appendix One

Vascular plant species identified

on Central Hamersley Range Tussock Grasslands

This list of vascular plants includes all specimens identified before 30 September 1996. Taxa are listed alphabetically in the order of genus and species in their respective families. The family sequence follows approximately the classification presented in Green (1985) "Census of the Vascular Plants of Western Australia". Nomenclature generally follows Green *op. cit.* and that employed by the Western Australian Herbarium, apart from a few exceptions where recent taxonomic revisions have suggested alternative classifications.

APPENDIX ONE

OPHIOGLOSSACEAE

Ophioglossum lusitanicum

ADIANTACEAE

Cheilanthes sp. (SVL 1151)

POACEAE

Aristida contorta
Aristida obscurva
Aristida sp. (SVL 1233)
Chloris barbata
Chrysopogon fallax
Dactylocterium radulans
Dichanthium humilis
Digitaria sp. (SVL 1201)
Enneapogon clelandii
Enneapogon polyphyllus
Eragrostis dielsii
Eragrostis eriopoda
Eragrostis setifolia
Eriachne dominii
Eriachne mucronata
Iselema mambranaceum
Paspalidium sp. (SVL 1127)
Plectrachne sp. (SVL 1141)
Sporobolus sp. (SVL 1116)
Themeda triandra
Tragus australiensis
Triodia basadowii
Triodia pungens
Triodia wiseana
Genus sp. (SVL 998)
Genus sp. (SVL 1027)
Genus sp. (SVL 1028)
Genus sp. (SVL 1029)
Genus sp. (SVL 1125)
Genus sp. (SVL 1128)
Genus sp. (SVL 1132)
Genus sp. (SVL 1138)
Genus sp. (SVL 1146)
Genus sp. (SVL 1200)
Genus sp. (SVL 1205)
Genus sp. (SVL 1207)
Genus sp. (SVL 1211)
Genus sp. (SVL 1224)

CYPERACEAE

Cyperus bulbosa
Genus sp. (SVL 1129)
Genus sp. (SVL 1209)
Genus sp. (SVL 1210)

PROTEACEAE

Grevillea pyramidalis
Grevillea stenobotrya
Hakea suberea

SANTALACEAE

Anthobolus leptomerioides
Exocarpus sparteus

LORANTHACEAE

Lysiana murryanum

CHENOPODIACEAE

Dysphania kalpari
Dysphania sp. (SVL 1002)
Marianum villosum
Rhagodia eremaea
Salsola kali
Scleroleana tetragona

AMARANTHACEAE

Amaranthus sp. (SVL 1321)
Ptilotus aervoides
Ptilotus calostachyus
Ptilotus exaltatus
Ptilotus helipteroides
Ptilotus obovatus
Ptilotus polystachyus
Ptilotus roei
Genus sp. (SVL 1182)
Genus sp (SVL 1183)
Genus sp (SVL 1184)
Genus sp. (SVL 1206)

APPENDIX ONE

Genus sp (SVL 1212)
Genus sp (SVL 1214)

NYCTAGINACEAE

Boerhavia sp. (SVL 1188)
Boerhavia sp. (SVL 1034)
Boerhavia sp. (SVL 1215)

GYROSTEMONACEAE

Codonocarpus cotinifolius

PORTULACACEAE

Genus sp. (SVL 1009)
Genus sp. (SVL 1133)

BRASSICACEAE

Lepidium echinatum
Lepidium sp. (SVL 1227)
Lepidium sp. (SVL 1008)
Lepidium sp. (SVL 1013)
Stenopetalum anfractum
Stenopetalum sp. (SVL 1014)

MIMOSACEAE

Acacia aneura - flat narrow long
Acacia aneura - flat narrow short
Acacia aneura - terrete
Acacia monticola
Acacia pruinocarpa
Acacia pyrifolia

CAESALPINIACEAE

Senna artemisioides subsp. *artemisioides*
Senna aretmsisioides subsp. *oligophylla*

PAPILIONACEAE

Rhyncosia minima
Swainsona sp. (SVL 1020)
Genus sp. (SVL 1036)

ZYGOPHYLLACEAE

Tribulus astrocarpa
Tribulus sp. (SVL 1122)
Zygophyllum sp. (SVL 990)

EUPHORBIACEAE

Euphorbia boophthoona
Euphorbia sp. (SVL 999)
Euphorbia sp. (SVL 1000)
Euphorbia sp. (SVL 1185)
Phyllanthus lacunellus

MALVACEAE

Gossypium australe
Hibiscus sp. (SVL 988)
Sida virgata
Sida sp. (SVL 1155)
Genus sp. (SVL 1139)
Genus sp. (SVL 1276)

MYRTACEAE

Corymbia deserticola
Eucalyptus camaldulensis
Eucalyptus victrix
Eucalyptus "*xerothermica*" ms

HALORAGACEAE

Haloragis gossei

APIACEAE

Trachymene sp. (SVL 992)

ASCLEPIADACEAE

Rynchorrena linearis

CONVOLVULACEAE

Evolvulus sp. (SVL 1032)
Porana sericea
Genus sp. (SVL 1208)

BORAGINACEAE

Trichodesma zeylanicum

APPENDIX ONE

VERBENACEAE

Spartothamnella tenuiflora

SOLANACEAE

Nicotiana rosulata subsp *rosulata*
Solanum ferrosisimum
Solanum lasiohpyllum
Solanum sp. (SVL 1267)

SCROPHULARIACEAE

Genus sp. (SVL 1218)

MYOPORACEAE

Eremophila forrestii
Eremophila latrobei
Eremophila "lanceloata" ms

RUBIACEAE

Canthium lineare

CAMPANULACEAE

Wahlenbergia tumidifructa

BRUNONIACEAE

Brunonia australia

GOODENIACEAE

Goodenia microptera
Goodenia prostrata
Goodenia sp. (SVL 1016)
Goodenia sp. (SVL 1058)
Scaevola sp. (SVL 1038)
Velleia connata

ASTERACEAE

Biden pinnata
Brachycome ciliocarpa
Calocephalus sp. 'aromatic' (SVL 979)
Calotis hispidula
Calotis multicaulis
Myriocephalum ruddii
Rhodanthe charsleyae
Rhodanthe floribundum
Rhodanthe propinquum
Genus sp. (SVL 1007)
Genus sp. (SVL 1015)
Genus sp. (SVL 1019)
Genus sp. (SVL 1040)
Genus sp. (SVL 1134)
Genus sp. (SVL 1282)
Genus sp. (SVL 1307)

APPENDIX TWO

APPENDIX TWO

HERITAGE COUNCIL OF WESTERN AUSTRALIAN NATIONAL ESTATE GRANT PROGRAM (N95/050)

Project: BOTANICAL SURVEY OF TUSSOCK GRASSLANDS WITHIN THE CENTRAL HAMERSLY RANGE.

Expenditure statement

	$
1996 (01/07/96 - 31/10/96)	
Materials & Equipment	690.00
Total expenditure (31/10/96)	**$ 690.00**

M. Sermon
Admin. Assistant
14/11/96