

NORTHERN TERRITORY NATIVE VEGETATION EXTENT BASELINE & MONITORING PROJECT

Kate Richardson and Dominique Lynch



**Natural
Heritage
Trust**

*Helping Communities
Helping Australia*

An Australian Government Initiative

This report has been produced in partnership with:



Disclaimer:

The views and opinions expressed in this report reflect those of the author and do not necessarily reflect those of the Australian Government or the National Land & Water Resources Audit. The material presented in this report is based on sources that are believed to be reliable. Whilst every care has been taken in the preparation of the report, the author gives no warranty that the said sources are correct and accepts no responsibility for any resultant errors contained herein any damages or loss, whatsoever caused or suffered by any individual or corporation.

Published by: National Land & Water Resources Audit

Postal address: GPO Box 2182
Canberra ACT 2601

Office Location: 86 Northbourne Ave
Braddon ACT 2612

Telephone: 02 6263 6035

Facsimile: 02 6257 9518

Email: info@nlwra.gov.au

Internet: <http://www.nlwra.gov.au>

© National Land & Water Resources Audit 2008

The National Land & Water Resources Audit provides data, information and nationwide assessments of Australia's land, water and biological resources to support sustainable development.

Publication data: Kate Richardson and Dominique Lynch (2008) *Northern Territory Native Vegetation Extent Baseline & Monitoring Project*, prepared for the National Land & Water Resources Audit, Canberra.

Information contained in this report may be copied or reproduced for study, research, information or educational purposes, subject to inclusion of an acknowledgement of the source. This project was managed by the National Land & Water Resources Audit.

Introduction

The native Vegetation Extent project is in response to obligations for reporting on resource condition targets, in this instance the integrity of Native vegetation communities.

The primary purpose of the baseline Native Vegetation extent is to provide the NLWRA with baseline data from which future comparisons may be made. The data will feed into a national compilation of native vegetation extent and ultimately type.

The project is carried out by Northern Territory Department of Natural Resources Environment and the Arts (NRETA).

The project aims are:

- To map the extent of native vegetation across the NT at the year 2004.
- To report and tabulate Native vegetation extents for the NT and for IBRA region.

Definition:

For mapping purposes 'native vegetation' extent is defined as

“any vegetation that retains 80% of its floristic and structural integrity as recorded prior to 1980.”

Although not pristine it can be regarded as relatively intact and un-fragmented. All native vegetation communities, either regrowth or undisturbed are mapped. The communities will include surface aquatic vegetation in all terrestrial water bodies excluding major rivers. Examples of this include closed and open water bodies such as billabongs and floodplain communities with a covering of vegetation communities including *Eleocharis* spp. or often forming floating mats of creeper species such as *Pistia* spp., *Pseudoraphis* spp., *Oryza* spp. and *Nymphaea* spp.

Methods

Native vegetation extent is the product of several datasets intersected to mask non-native areas from area across the Northern Territory. As Baseline information is updated, resulting in the creation of new baselines the new version will be dated and forwarded.

The datasets used for NT Native Vegetation Extent baseline-Version 1 include:

- Native Vegetation Clearing Dataset

Multiple datasets have been used to derive the clearing coverage of the NT. These include pastoral land records (1992), BRS data (1990-1995), satellite imagery spanning back to 1972, NTG road and planning/development information.

The original source of the data is satellite imagery, derived from 25m and 50m Landsat data. This equates to an on-ground scale of 1:100 000.

The Top-End of the Territory – the Tiwi Islands, Darwin, Port Keats, Mary River, Katherine, Mataranka, and Sturt Plateau is updated annually with 25m Landsat data. The rest of the Territory is updated every 2 years with the data provided from the Australian Greenhouse Office (AGO) dataset.

Clearing is defined **“all areas where ‘native’ vegetation has undergone any land cover change due to removal by mechanical or chemical means, but not including the removal of vegetation by grazing animals.”**

The mapped clearing dataset has been derived by a number of band ratios (including NDVI and difference imaging) that highlights cleared lands.

- NVIS V3 vegetation mapping

Is a reconnaissance level compilation (1:250,000 scale dataset) compiled from a number of vegetation and land unit survey maps that were recoded and re-attributed for the National Vegetation Information System (NVIS), which forms Theme 3 of the National Land & Water Audit of Australia, 2000 (NLWRA2000). In all the surveys attributed to NVIS standard in the NT, a 'PRE1750' vegetation coverage was taken to be the original survey coverage produced. An 'EXTANT' coverage or present day coverage represents, in theory, the present day (eg year 1998) vegetation coverage. This was produced by updating the 'PRE1750' coverage with Native Vegetation Clearing Dataset.

- LUMP – Land use mapping project of the Northern Territory, 2003.

The Peri-urban Intensive Agricultural and Urban Zones around Darwin, Katherine and Alice Springs were mapped at 1:25,000 the Northern Agricultural Zone mostly comprising the Katherine-Daly Region was mapped at 1:100,000; whilst the Pastoral Zone and the remainder of the Northern Territory was mapped at a scale of 1:250,000. These zonal boundaries will be used to outline vegetation extent mapping scales. The land use information has been derived from satellite imagery interpretation and field data describing land use type and distribution collected according to Australian Land Use and Management Classification V.6.

- The Northern Territory Weeds dataset is a compilation of point , polyline and polygon data representing density and distribution of weed species in the areas surveyed.

Area assessment:

Area is calculated from spatial mapping projected into Lamberts Conical projection.

Projection file;
 Projection: Lambert_Conformal_Conic
 False_Easting: 0.000000
 False_Northing: 0.000000
 Central_Meridian: 133.500000
 Standard_Parallel_1: -12.666667
 Standard_Parallel_2: -23.333333
 Scale_Factor: 1.000000
 Latitude_Of_Origin: 0.000000
 Linear Unit: Meter (1.000000)

Geographic Coordinate System: GCS_GDA_1994
 Angular Unit: Degree (0.017453292519943299)
 Prime Meridian: Greenwich (0.000000000000000000)
 Datum: D_GDA_1994

Native vegetation area is determined using boundary of the following datasets:

Dataset	Scale
GEODATA COAST 100K 2004	1:100,000
IBRA ver 6.1	1:250,000
NT SWMA 2000	1:25,000

Results - Native Vegetation Extent

Constraints in the final map products

- area specific and some type specific weed mapping and no complete NT coverage. Point data is extrapolated using remote sensing data to produce polygon data for baseline mapping. Some areas the data is too broad or not available to allow point extrapolation mapping to proceed.
- Not all Datasets correspond with the above 'native vegetation' definition and therefore do not directly coincide with requirements to map native vegetation extent. For example the LUMP-2003 dataset used cadastral boundaries when attributing the spatial dataset and consequently the line work does not define areas within these boundaries of native versus non-native vegetation as per this project. The 1:25,000 mapping in intensive use zones is beyond the scale of the Land clearing data and therefore is only indicative. Consequently extensive editing is required which is challenging in those areas where remote sensing data is limited.
- No on-ground checking in the field is carried out for this project due to mapping being carried out 3 years later (2007) than date of baseline data (2004). Although the data sets utilised have involved some field checking.

Table 1: Area across Northern Territory in 2004.

	Hectares	%
Total area	134313828	
non_native	17104723	1.3
non_vegetation	181639	0.1
native	132421716	98.6

Table 2: Area (Hectares) by IBRA region across Northern Territory 2004.

Note: Area is calculated from spatial mapping projected into Lamberts Conical projection.

IBRA	TOTAL	Non_Native	Non_Veg	Native	% Native
Arnhem Coast	3333394.7	11737.5	6237.3	3315419.8	99.5%
Arnhem Plateau	2303488.0	1169.6	713.5	2301604.9	99.9%
Burt Plain	7360423.0	13649.8	27814.9	7318958.2	99.4%
Central Arnhem	3454758.5	2804.1	838.5	3451115.9	99.9%
Central Ranges	2602376.6	1337.0	1615.2	2599424.4	99.9%
Channel Country	2321660.3	917.2	2877.4	2317865.8	99.8%
Daly Basin	2083115.2	228472.7	5144.7	1849497.9	88.8%
Darwin Coastal	2840248.2	159829.5	14136.6	2666282.1	93.9%
Davenport Murchison Ranges	5762776.0	8886.1	694.8	5753195.1	99.8%
Finke	5464346.1	12586.7	20033.4	5431726.0	99.4%
Great Sandy Desert	9995024.5	3764.1	466.9	9990793.4	100.0%
Gulf Coastal	2690759.2	1799.1	14856.6	2674103.4	99.4%
Gulf Fall and Uplands	11178404.1	8040.8	4995.2	11165368.1	99.9%
Gulf Plains	145943.0		13.1	145929.8	100.0%
MacDonnell Ranges	3934954.0	9752.8	11273.4	3913927.8	99.5%
Mitchell Grass Downs	9236987.7	6206.6	1276.0	9229505.0	99.9%
Mount Isa Inlier	22391.8			22391.8	100.0%
Ord Victoria Plain	6985561.5	15806.6	2987.4	6966767.5	99.7%
Pine Creek	2845594.8	76744.4	9170.4	2759680.0	97.0%
Simpson Strzelecki Dunefields	10583729.4	2062.8	12962.7	10568703.9	99.9%
Stony Plains	171452.8	256.4	630.6	170565.8	99.5%
Sturt Plateau	9780851.2	1089437.9	2962.4	8688450.9	88.8%
Tanami	22825448.4	11094.4	13239.7	22801114.3	99.9%
Tiwi Cobourg	1014368.2	18934.5	1451.9	993981.8	98.0%
Victoria Bonaparte	5375771.1	25182.3	25246.1	5325342.7	99.1%
Grand Total	134313828.3	1710472.9	181639.0	132421716.4	98.6%

Table 3: Area (Hectare) by River Basins across Northern Territory 2004.

Water catchment	Total	Non-Native	Non-Veg	Native	% Native
Adelaide River	745458.6	52594.5	3616.8	689247.3	92.5%
Barkly	12302963.7	10119.3	635.4	12292209.0	99.9%
Bathurst and Melville Islands	751305.8	18505.3	1450.5	731350.0	97.3%
Blyth River	921575.8	1029.0	1036.0	919510.7	99.8%
Buckingham River	960860.7	5348.2	1975.3	953537.3	99.2%
Burt	3878066.0	5198.4	1890.2	3870977.4	99.8%
Calvert River	995025.4	562.2	1732.8	992730.4	99.8%
Daly River	5295054.8	296988.2	10079.3	4987987.3	94.2%
Darwin / Blackmore Rivers	81585.6	13626.7	4703.3	63255.7	77.5%
East Alligator River	1590101.8	3289.7	2974.6	1583837.5	99.6%
Finke River (NT)	4412120.8	5448.0	24901.8	4381771.1	99.3%
Finniss / Elizabeth / Howard Rivers	866453.9	97936.0	1100.1	767417.9	88.6%
Fitzmaurice River	1031849.6	114.6	1821.4	1029913.5	99.8%
Georgina River (NT)	9944651.1	6100.1	13431.0	9925120.0	99.8%
Georgina River (Qld)	77.9	0.0		77.9	100.0%
Goomadeer River	569456.8	307.3	886.3	568263.2	99.8%
Goyder River	1037938.1	1480.5	1053.8	1035403.9	99.8%
Groote Eylandt	235233.2	2655.0	214.9	232363.3	98.8%
Hay River (NT)	6297763.2	2094.4	16081.3	6279587.6	99.7%
Hay River (Qld)	13.5			13.5	100.0%
Keep River (NT)	596266.4	887.0	2313.0	593066.4	99.5%
Keep River (WA)	2.9	0.0		2.9	100.0%
Koolatong River	790470.0	1339.4	326.9	788803.7	99.8%
Limmen Bight River	1582204.6	784.5	3622.3	1577797.8	99.7%
Liverpool River	894302.6	903.5	965.4	892433.8	99.8%
Mackay (NT)	21587639.7	14115.8	4360.0	21569163.9	99.9%
Mackay (WA)	4.3	0.0		4.3	100.0%
Mary River (WA)	806131.3	26168.8	2926.0	777036.6	96.4%
McArthur River	1986233.0	2372.1	4341.6	1979519.3	99.7%
Moyle River	705723.6	6732.9	618.6	698372.1	99.0%
Nicholson River (NT)	1563874.1	827.9	296.0	1562750.1	99.9%
Nicholson River (Qld)	26.4	0.0		26.4	100.0%
Ord River (NT)	1126041.3	1081.6	1788.4	1123171.4	99.7%
Ord River (WA)	2.3	0.0		2.3	100.0%
Robinson River	1127870.9	698.5	2631.2	1124541.2	99.7%
Roper River	7916896.0	41780.5	8519.0	7866596.5	99.4%
Rosie River	500973.7	187.4	383.6	500402.7	99.9%
Settlement Creek (NT)	544815.4	228.4	10.7	544576.4	100.0%
Settlement Creek (Qld)	15.9			15.9	100.0%
South Alligator River	1190209.1	3793.7	3400.1	1183015.3	99.4%
Todd River	5989316.6	14411.4	11410.3	5963495.0	99.6%
Towns River	539810.7	112.6	528.8	539169.2	99.9%
Victoria River	7754394.5	6356.0	21787.8	7726250.8	99.6%
Walker River	969767.6	884.5	647.7	968235.4	99.8%
Warburton (NT)	973886.9	323.0		973563.9	100.0%
Warburton (WA)	0.2			0.2	100.0%
Wildman River	481868.0	6955.2	924.7	473988.2	98.4%
Wiso	22766137.7	19598.7	20179.5	22726359.5	99.8%
Grand Total	134312442.3	673940.6	181566.0	133456935.6	99.4%

Appendix A
Baseline Datasets
For
NT 2004 Native Vegetation Extent Baseline.

Dataset Name	Date	Scale		ANZLIC Metadata
GEODATA COAST 100K 2004	2004	100,000	Custodian: Geoscience Australia	Dataset ID: ANZCW0703006621
NT_IBRA_61	2004		Australian Government- Department of the Environment and Heritage, Reserve Systems Section.	Dataset ID: ANZCW0501009866
NVIS V3 Vegetation Map	2001	250,000	Custodian: Land and Water Division. DNRETA, NT. for more information refer National Vegetation Information System (NVIS)	Dataset ID: ANZNT0001001047
LUMP	2003	25,000 – Intensive land use zone, 100,000 250,000	Report: Owen, G.A and Meakin, C.F., Report No. 02/2003D. LAND USE MAPPING OF THE NORTHERN TERRITORY Department of Infrastructure, Planning and Environment, Darwin 2003	Dataset ID: ANZNT0782000075
Native Vegetation Clearing Dataset	2004	100,000	Department dataset. Custodian: Natural Resource Management Division. DNRETA, NT	Dataset ID: ANZNT0903000062
NT Weeds	2004	Various	Departmental dataset. Custodian; Weed Management Branch, DNRETA, NT.	

Projection: Lambert_Conformal_Conic
False_Easting: 0.000000
False_Northing: 0.000000
Central_Meridian: 133.500000
Standard_Parallel_1: -12.666667
Standard_Parallel_2: -23.333333
Scale_Factor: 1.000000
Latitude_Of_Origin: 0.000000
Linear Unit: Meter (1.000000)

Geographic Coordinate System: GCS_GDA_1994
Angular Unit: Degree (0.017453292519943299)
Prime Meridian: Greenwich (0.000000000000000000)
Datum: D_GDA_1994