

De-Risking Phase II – NT Sustainable Precincts

Multi-Criteria Analysis to Identify
a Case Study Area



Australian Government
Department of Industry,
Science and Resources

AusIndustry
Cooperative Research
Centres Program



**NORTHERN
TERRITORY**
GOVERNMENT





DISCLAIMER

The Northern Territory of Australia, acting through the Department of Industry, Tourism and Trade, has exercised due care and skill in preparing and compiling the information and data in this publication. While all care has been taken to ensure that the information contained in this publication is true and correct at the time of publication, it is not intended to be relied on as a comprehensive representation of technical or scientific advice or used for commercial purposes.

The Territory gives no warranty or assurances as to the accuracy of the information contained in the publication and accepts no direct or indirect liability for reliance on its content, including liability for negligence and for any loss, damage, injury, expense or cost incurred by any person directly or indirectly as a result of accessing, using or relying on any of the content of this publication to the maximum extent permitted by law.

Executive summary

The Cooperative Research Centre for Developing Northern Australia (CRCNA) in partnership with the Northern Territory (NT) Department of Industry, Trade and Tourism (DITT) have commenced the Phase II De-risking Agricultural Development Program.

Based on the findings of Phase I of the program, CRCNA has made several strategic investments in exploring barriers to agricultural development across the north. One of these investments seeks to answer: how can improved prioritisation and planning practice support new sustainable development precincts in the Northern Territory. Consequently, the CRCNA and DITT have jointly invested in the “De-risking the NT Through Sustainable Development Precincts” project.

This project aims to resolve this research question and will be developed and implemented within the context of the *NT Agribusiness Strategy 2030*. Overall, this research will seek to improve planning and assessment practice for sustainable development precincts.

The Territory has long been known for its mosaic agriculture model of development, and as such, DITT has worked closely with the Department of Environment, Parks and Water Security (DEPWS) to identify and prepare to progress precinct opportunities within the Northern Territory. Eleven precinct areas were identified based on technical studies, including soil and water, access to logistics routes and other supporting criteria. This report outlines the multi-criteria analysis-based (MCA) approach.

Each precinct area was evaluated based on the objectives set out in the *Best Practice Sustainable Precinct Planning and Development Framework*.

Flowing on from this MCA-based approach, one precinct has been identified as the focal area to progress a case study that can support improved practice in planning new priority agricultural development areas and improved development assessment within those spaces. DITT aims to apply its emerging *Planning and Development Framework* in progressing priority activities within this focus precinct.

Background

Between 2018 and 2020, the CRCNA completed a study into ‘De-risking, brokering and prioritising agricultural development in the Northern Territory’ (Phase I). This study formed part of a wider collaboration between the CRCNA and the Northern Territory, Queensland (QLD) and Western Australian (WA) governments, all aimed at supporting the development of new agricultural activity across northern Australia. The final report was published in November 2020.

The Phase I report’s recommendations proposed to enable pathways to sustainable (economic, environment, and social) development. These include:

- developing an efficient approach to converting parts of pastoral leases to freehold
- de-risking agricultural precincts that provide certainty for investors
- enabling Aboriginal agricultural development
- targeting infrastructure to facilitate development
- providing a supportive regulatory environment
- strategic de-risking in coordinated and targeted research, and
- improving trust, relationships and culture in development assessment and approval.

The next stage (Phase II) research project De-Risking the NT Through Sustainable Development Precincts, seeks to answer the core question: how can improved prioritisation and planning practice support new sustainable development precincts in the Northern Territory? This Phase II project is due for completion by October 2024.

The report responds to a specific milestone within that project that aims to explore the application of a multi-criteria approach in identifying priority precincts to be progressed by the NT Government, and more specifically, a focal precinct to trial. The focal area will evaluate and improve best practice approaches to precinct planning and development.

Definition of a sustainable development precinct (SDP)

Sustainable development precincts are identified through a master planning approach, to support and grow the economy and region by targeting investors and new demand markets.

Integral features of a sustainable development precinct include suitable soils and availability of water evidenced by science and robust regulation, as well as access to critical transport and logistics routes whilst supporting environmental and cultural values.

An SDP may also include existing or future infrastructure such as communications, power and water, accommodation, workforce availability, market opportunities or land access for ancillary use, noting these features are dependent on the investment readiness of the area.

An SDP should provide ease of access to existing business or supporting services, and stimulate broad community activity and regional growth to maximise economic and social benefit for more than one proponent.

Goal and objectives

Build a multi-criteria analysis and evidence base to prioritise a significant case study area for improved practice in planning and development of sustainable agricultural growth in the Northern Territory.

Selection and justification of criteria used

Determining priority assessment criteria

Three priority criteria were deemed essential for achieving successful and sustainable agricultural activities.

Findings and discussions contained in the CRCNA 'De-risking, brokering and prioritising agricultural development in the Northern Territory' Phase I report confirmed that favourable soil and water studies – specifically water availability assessments and land resource mapping – are critical features of suitable agribusiness sites.

Also highlighted in the report was the potential for poor product quality and subsequent value loss when transported over vast distances and/or rudimentary roads.

Based on these results, it is determined that the combination of the three priority criteria provides optimal foundations for profitable farming opportunities. Details of each criteria are below.

Priority criteria:

- **Soil quality and volume/area** – suitable soil is the vital foundation for vegetation and agriculture, supporting the security of food, animal feed, fuel, natural fibres and a range of ecosystem functions. Without good soils, farming efforts are futile.
- **Water availability** – irrigated agricultural production is highly dependent on water. Agribusiness opportunities are limited to dryland and pasture/livestock without sufficient volumes of, and appropriate access to, good quality water.
- **Logistics routes for all weather access** – effective logistical routes are critical for the delivery of agricultural products in a timely manner, in good condition, and for the right price. The same is true for the provision of goods and services to the farming site and surrounding community.

Supporting criteria:

- **Land suitable for agricultural development** – relative to the priority criteria of water and soil studies that specifically identify areas suitable for development, this land may form a mosaic structure across the greater region and ideally have sufficient supply/area to support agricultural activities .
- **Land tenure (pastoral and Indigenous land)** – the Territory Economic Reconstruction Commission (TERC) Final Report endorses the facilitation of sustainable development on both Aboriginal land and the pastoral land estate. The inclusion of these tenures will seek to continue with proposals and initiatives for diversification of industry, and the support of cultural development, in line with the TERC implementation plan recommendation.
- **Existing infrastructure (power, water, roads and communications)** – the presence of amenities already at or around the site typically reduces both expenditure and level of work required to create investment-ready land and also indicates the existence of some form of established community nearby.

- **Market opportunities** – depending on the location and type of agricultural product the opportunity varies significantly between regions. The NT is in close proximity to international market opportunities, however the long distances between towns/cities within the Northern Territory affect the level of opportunity. International markets rely on supply chain and logistics routes to get product to market. The Territory lends itself to filling seasonal market gaps with the opportunity to supply produce to Australia.
- **Workforce availability or attraction potential** – workers are more likely to commit to employment in locations that offer a balance of financial and social benefits. Easy access to established communities is typically a more attractive option than remote areas, which can feel very isolated for many people, resulting in poor staff retention.

Research Design and Methods

Internal stakeholder engagement between DITT and DEPWS resulted in the formulation of the assessment criteria. DEPWS were integral throughout the research phase providing technical expertise, data and analysis through extensive mapping of the Territory for land soil types, agricultural suitability assessments and water resources mapping.

Studies completed by NTG:

- land use planning – NT Planning Commission
- soil data/land resources - DEPWS
- vegetation
- water resources – DEPWS
- water allocation planning
- biodiversity
- sacred sites.

Stakeholder engagement

Stakeholders within relevant NT Government departments were involved in the identification of precinct areas and the multi-criteria analysis process, providing technical advice and expertise specifically historical data, scientific research, legislation detail, processes and practices, former contentious issues and potential impediments going forward in each area.

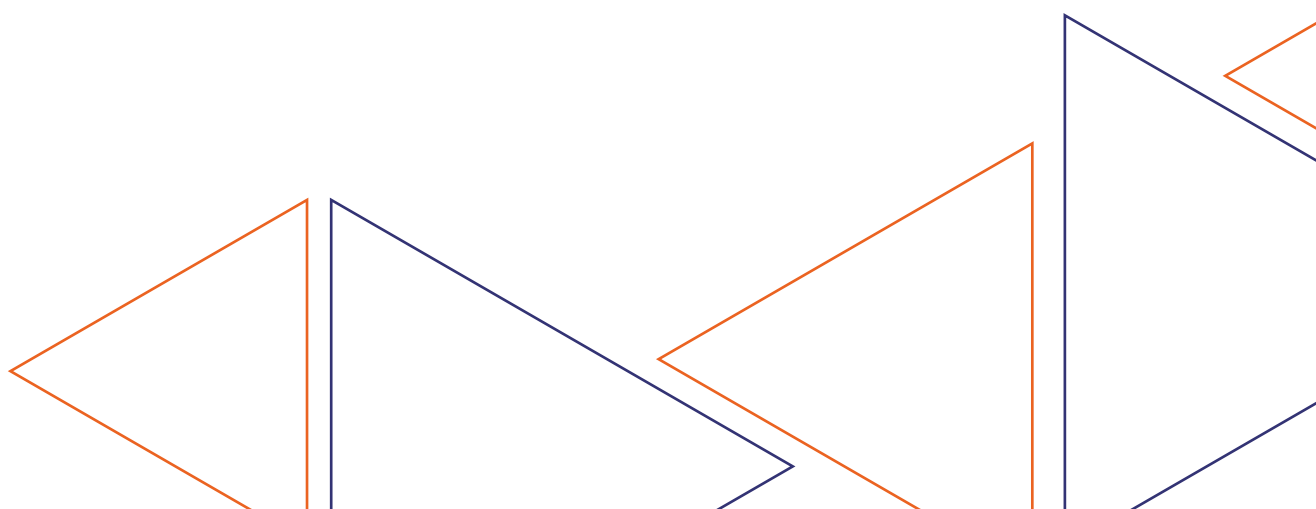
The below areas provided input:

- DEPWS Rangelands
- DEPWS Water Resources
- DITT Fisheries
- DITT Strategic Policy and Reform.

Industry stakeholders will be formally engaged through the next phase of stakeholder engagement to ensure the outcomes are accepted and desirable.

Structure of Analysis

Studies carried out at each of the nominated locations were assessed using a points system reflecting importance of site criteria. Comparison of results identified the precinct area that would best support the case study focal area.



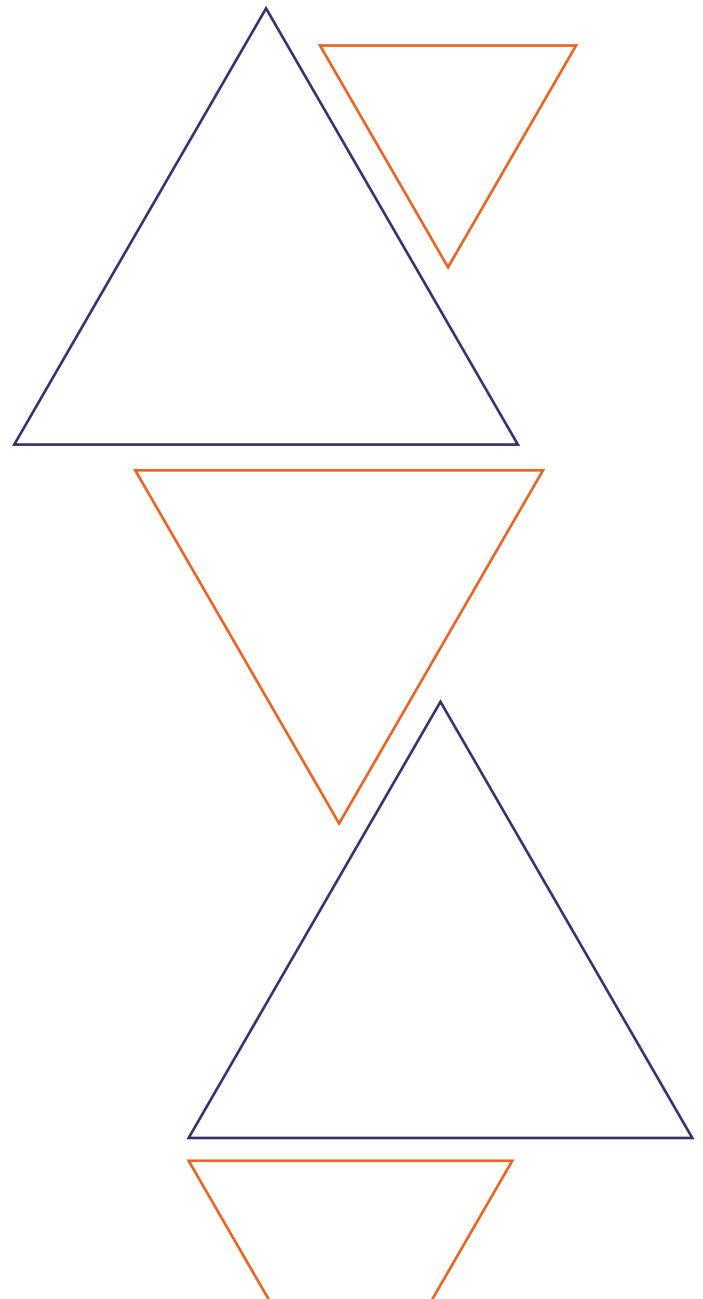
Identification of precinct areas within the Northern Territory

The following precincts were identified taking into account the selection process outlined above. The below table provides the areas identified and whether it is an existing or new precinct. The precincts were identified in collaboration with Department of Environment, Parks and Water Security based on technical data and supporting criteria.

Precinct Location	Existing/Future
Barkly	F
Douglas Daly	E
Gunn Point Agricultural Precinct	E
Katherine	E
Lambells Lagoon Horticultural Precinct	E
Larrimah Agricultural Precinct	E
Marrakai Heights	F
Marrakai Downs	F
Mataranka	E
Western Davenport	E
Wildman Agricultural Precinct	E

Both existing and future precinct identification has been included due to the opportunities that are still present in existing precincts.

An outline of each individual precinct is detailed below, including technical references that support the inclusion of the area.



Barkly

The Barkly Tablelands region consists largely of cattle stations with open grass plains. Land tenure in the region includes pastoral, crown, Aboriginal land trust and Aboriginal-owned freehold.

The area covers four broad geomorphic zones of black soil plains, laterite plains, bedrock hills and desert country. The black soil plains, commonly referred to as the Barkly Tablelands is an extensive and largely treeless black soil plain extending some 500km from northwest to southeast and some 200km from northeast to southwest.

It is situated above the Georgina Basin, a large geological basin with extensive aquifers formed in fractured and cavernous limestone. This makes groundwater widely available and often the best option for stock supplies.

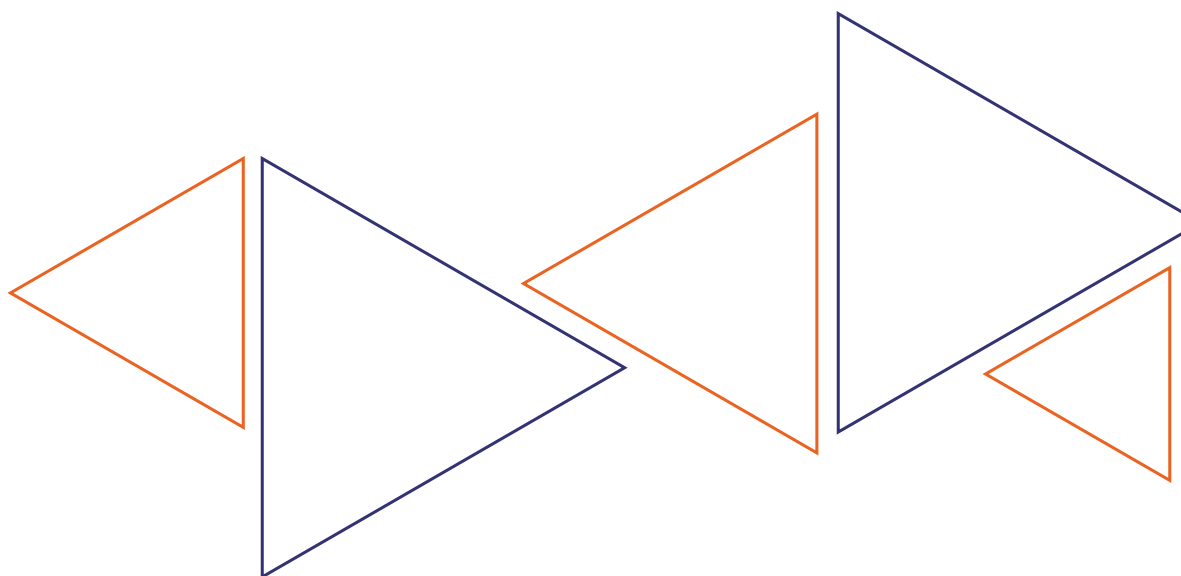
The area has a semi-arid subtropical climate. Rain occurs predominantly during the summer months with average annual rainfall varying from around 400mm in the south through to 600mm in the north.

An approximate frost line limit zigzags across the region and forms an approximate half-way split between the northern and southern parts of the Barkly Region. Isohyets and the frost line limit will become critical when determining the prospective horticulture areas.

The largest town in the region is Tennant Creek, approximately 1,000km south of Darwin and 500km north of Alice Springs. Tennant is the service hub for the surrounding region and has education and health facilities and an airstrip.

The Barkly is in a strategic position logistically with access from the Barkly Highway linking to the east coast of Australia whilst also being in close proximity to the Stuart Highway with Darwin to Adelaide links.

The energy sector is looking at the Barkly to produce clean renewable energy through solar farms with Sun Cable planning to build the world's largest solar farm in the Barkly to provide 20% of Singapore's energy needs by 2027.



References:

Water Resources, DIPE 2003

Land Systems of the Barkly Region, 1947-48

Regional Plan 2021-2022, Barkly Regional Council

Douglas Daly

The precinct area consists of extensive existing agricultural development with a mix of land tenure including freehold and pastoral leases.

The region provides numerous competitive advantages for plant-based agriculture and horticulture. There is potential for brownfield cropping development where existing and successful cattle and hay production farming enterprises exist.

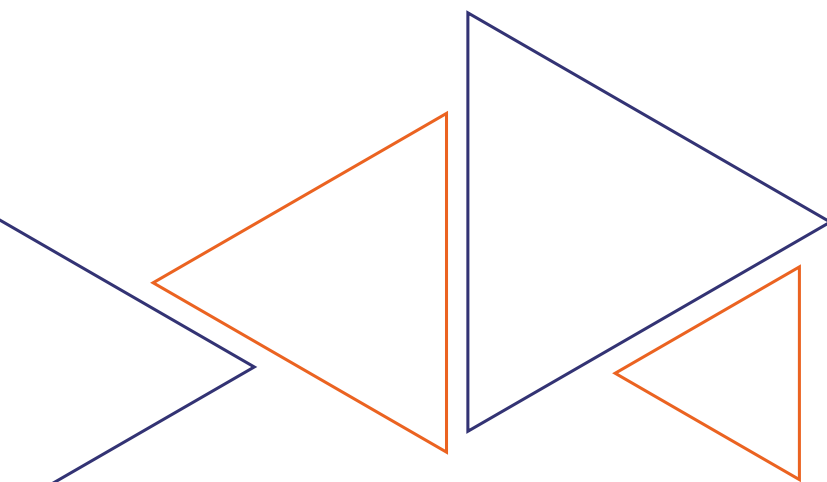
Stage 1 of Douglas Daly was developed by Agricultural Development and Marketing Authority (ADMA) in 1980 which established project farms on land excised from pastoral leases. Strict conditions around broad-acre rain-fed cropping of grains were imposed on farmers and grain handling infrastructure was built in both Douglas Daly and Katherine. Stage 2 known as Stray Creek was the release of seven blocks in the early 2000's which also had development conditions relating to agriculture.

The landforms, vegetation and soils across the precinct are diverse and include: sandy or loamy red earths, yellow earths or skeletal soils underlain by limestones, shales and other sediments.

Perennial rivers throughout the region support irrigation development, domestic and stock use. The region may have future opportunity for wet season surface water harvest within the catchment. There is also a managed aquifer recharge site identified on Stray Creek which would treat and then inject water into the Ooloo Dolostone aquifer which has capacity for artificial storage in the aquifer at the end of each wet season. A water allocation plan exists for the Ooloo Dolostone Aquifer 2019-2029.

With existing public infrastructure, roads, school and community facilities, Douglas Daly is an attractive area for families. The closest town is Adelaide River 100km away which has a number of facilities and a community health centre. To the north, the major cities of Palmerston and Darwin are 190km and 210km away respectively. To the south, the major town of Katherine is 200km away.

Cattle, forestry (African mahogany and sandalwood), melons, turf, rain-fed hay and fodder make up some of the agricultural diversity of the region. Cotton is envisaged to be the most pivotal plant-based agricultural crop going forward, incorporating rotations of sorghum, rice, legumes, maize or other high value crops.



References:

Land Resources of the Daly River Basin, NRETAS 2006
Ooloo Dolostone Aquifer Water Allocation Plan 2019-2029

Gunn Point

Owned by the Northern Territory Land Corporation, N.T. Portion 2626 has an area under title of 26,070 hectares. 260 hectares has been selected to form the Gunn Point Emerging Agribusiness Precinct.

The Gunn Point Emerging Agribusiness Precinct is being established for the purposes of marketable crop trials where there is no current commercial production harvested in the Northern Territory. These trials will explore the viability of agricultural opportunities with potential for growth on a broader scale.

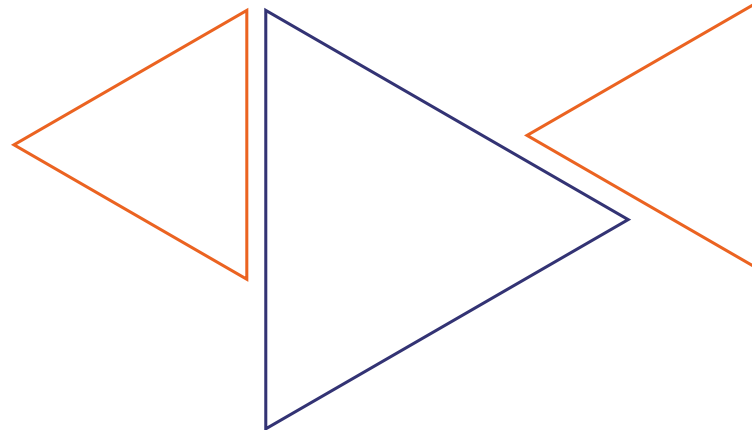
A land capability assessment carried out in 2017 found soil landscapes that are predominantly deep, gravelly, sandy or loamy surfaced red earths on gently undulating plains.

Groundwater resource investigations in 2020 confirmed the presence of a productive aquifer

however the water chemistry analyses indicate the groundwater underlying the northern parts of the peninsula are impacted by salt water intrusion. The water quality is therefore best suited for farming purposes towards the inland portions of the site, away from the coastal regions.

The area is accessible via Gunn Point Road approximately 50km from the Stuart Highway at the Howard Springs intersection and entrance to the city of Palmerston. The city of Darwin is another 20km further northwest. The short distances between Gunn Point and these major town centres makes this site excellent for workforce potential and community service access.

Potential crops identified as suitable for growth here are monsoonal tropical, tropical citrus and fruit row crops.



References:

[Gunn Point - Department of Environment, Parks and Water Security](#)

Katherine

Katherine's rich natural assets and strategic positioning to interstate and overseas markets present multiple opportunities for growth.

The precinct area consists of extensive existing agricultural development scattered around the township. The region provides numerous competitive advantages for plant-based agriculture and horticulture. There is potential for further development where there are existing and successful cattle and hay production farming enterprises.

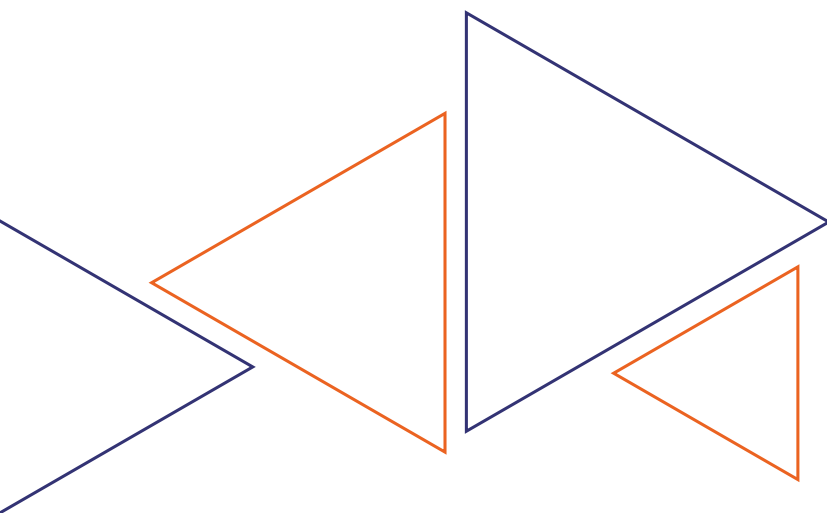
Potential horticulture sites were identified in the Katherine Land Use Plan 2014 in the Florina, Manbulloo and Venn areas. The region has significant areas of well-draining, deep soils with properties capable of irrigated cropping. DEPWS are currently completing further continuous mapping as part of the Mapping the Future program.

A water allocation plan exists for the Tindall Limestone aquifer in the Katherine region. As stated in the plan, the aquifer "... represents one of the Territory's highest yielding, good quality groundwater resources. The geological makeup of the Tindall formation is a karstic system featuring spring discharge, sinkholes, limestone outcrops and intricate cave systems."

The main tributary of the Daly River is the Katherine River, with the remaining key tributaries including the Flora, Fergusson, Edith, and Douglas rivers. The region may have future opportunity for wet season surface water harvest within the catchment. There are also managed aquifer recharge sites identified on the King River which would treat and then inject water into the aquifer which has capacity for artificial storage in the aquifer at the end of each wet season.

Katherine is a regional hub located 320km southeast of Darwin. Connected by rail, the town is at the crossroads of two major highways: Victoria Highway to Western Australia and Stuart Highway, linking Darwin and Southeast Asia through the Port of Darwin to our southern states.

The Katherine Agribusiness and Logistics Hub is being developed to support agricultural industry close to the town.



References:

Katherine Land Use Plan, Northern Territory Planning Commission 2014
Water Resource Availability Map within 150km of Katherine, DIPE 2002

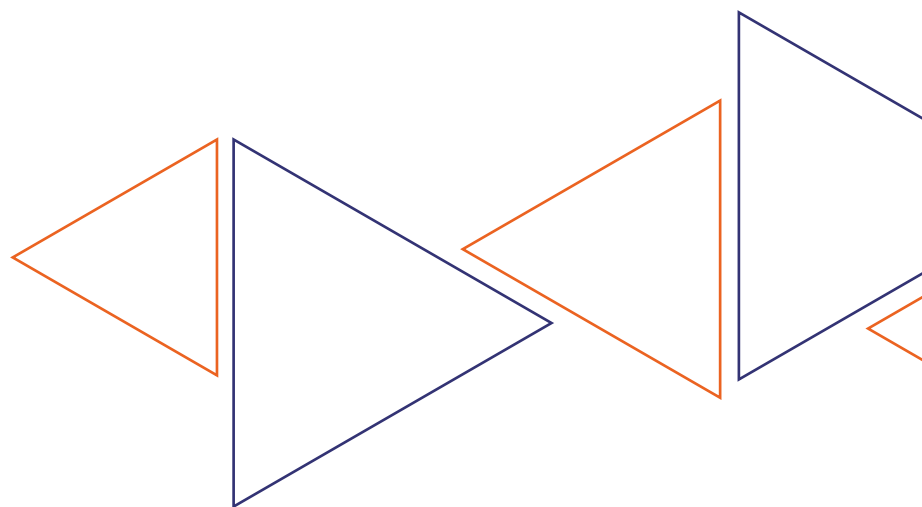
Lambells Lagoon

The first stage of Lambells Lagoon was developed in the 1990s with further agricultural expansion opportunities identified in this location.

The landforms, vegetation and soils across the site are diverse and include: flat plains of gravelly yellow massive earths, low hills and gentle side slopes. Wetlands and poor draining soils are scattered throughout the site. Groundwater found north in Black Jungle is free of salinity.

The closest neighbouring communities are Palmerston and Darwin at 30km and 50km respectively. These major centres provide ease of access to excellent community services and resources.

Horticulture in the area includes mangos, melons, bananas, pineapples, pumpkins and plant nurseries.



References:

[REPORT_Water-Resources-of-the-Howard-River-Region.pdf \(greeningaustralia.org.au\)](#)
[Territory Stories - Land units of the Lambells Lagoon - Middle Point area](#)

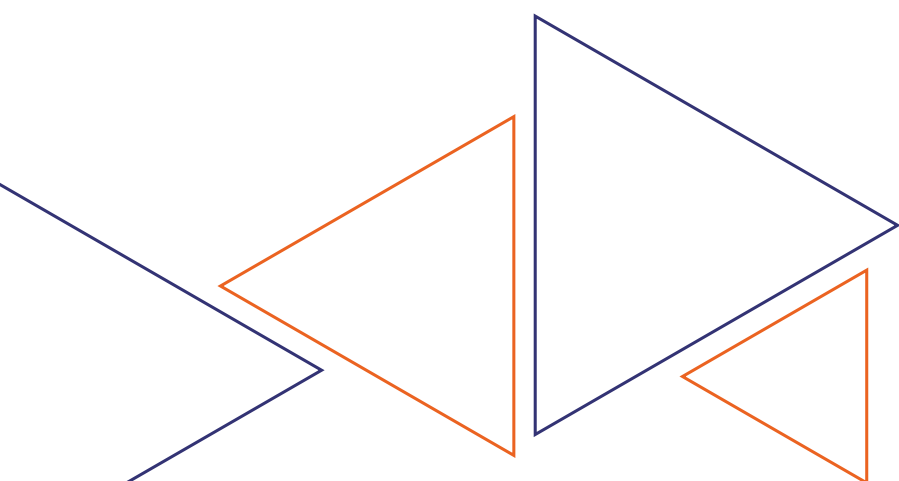
Larrimah

Larrimah is located along the Stuart Highway approximately 180km south of Katherine and 500km south of Darwin.

The landforms vegetation and soils surrounding the township of Larrimah include versatile land associated with suitable agriculture such as predominantly deep, well-drained, sandy surfaced red earths on level to very gently undulating plains and lower pediment slopes.

Seasonal rainfall in the region makes this site appropriate for range of dryland crops as well as irrigated crops including mangoes, citrus, melons, along with intensified beef production.

The Tindall Limestone aquifer lies beneath the studied area deeming this site subject to the proposed Tindall Mataranka – Daly Waters Allocation Plan.



References:

[*Territory Stories - Soil and Land Suitability Assessment for Irrigated Agriculture in the Larrimah Area, Sturt Plateau*](#)
[*Mataranka Tindall Limestone Aquifer Water Allocation Plan - Department of Environment, Parks and Water Security*](#)

Marrakai Heights and Marrakai Downs

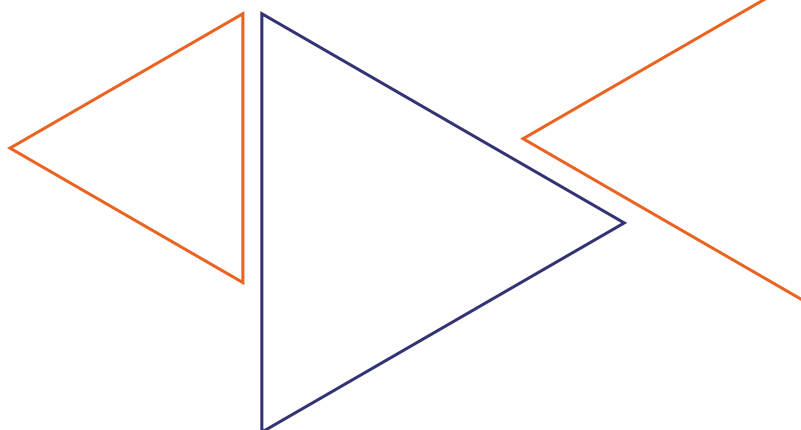
The landforms, vegetation and soils across both the north and south sites are diverse and include: higher hills and ridges, low hills and rises, sandy and clay soil plains of variable depths, floodplains, drainage systems and riverbanks. Proterozoic dolostone aquifers may offer potential for future groundwater resource development.

Marrakai's closest neighbouring town is Batchelor approximately 40km away, with the larger city of Darwin approximately 90km away. The town of Adelaide River is located 55km away and Palmerston City 70km, making Marrakai an attractive area for families in close proximity to multiple communities with health and educational facilities.

Entrance to the site is from Marrakai Road (unsealed) which can be accessed from both Stuart and Arnhem Highways.

Rice is grown on neighbouring Mt Keppler, and cattle, mahogany, melons, mangoes, turf, hay and fodder make up some of the agricultural diversity of the greater region.

The Adelaide River Off-stream Water Storage (AROWS) is a proposed reservoir located to the west of the site, approximately 5km directly north of Lake Bennett. The area will store water harvested from the Adelaide River during the wet season flows. An objective of the AROWS project is to enable agricultural development and industrial activities in the region.



References:

[Digital soil mapping of the Fitzroy, Darwin and Mitchell catchments \(csiro.au\)](#)

[Land suitability of the Fitzroy, Darwin and Mitchell catchments \(csiro.au\)](#)

[Hydrogeological characterisation of the Mary-Wildman rivers area, Northern Territory \(csiro.au\)](#)

[Groundwater flow modelling of the Mary-Wildman rivers area, Northern Territory \(csiro.au\)](#)

Mataranka

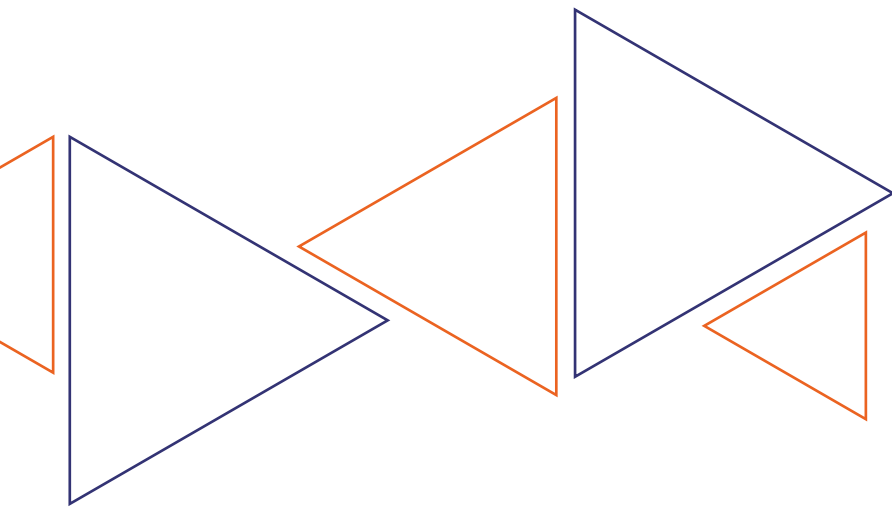
A mixture of sandy red earths, red earths, earthy sands and lateritic podzolics can be found scattered across the site indicating good potential for agriculture. The Tindall Limestone aquifer lies beneath the studied area deeming this site subject to the proposed Tindall Mataranka – Daly Waters Allocation Plan.

The Stuart Highway runs north-south through the district, offering excellent logistical supply routes and access to surrounding communities.

Katherine is Mataranka's closest neighbouring community at a distance of about 100km and Darwin is just over 400km to the north of the Mataranka region.

There has been success in farming cattle, melons and mangoes in the area and the zone holds good potential for horticulture.

Mataranka is known for its natural hot thermal springs, with the town and surrounds a popular attraction for tourists and locals alike.



References:

[Territory Stories - Land Resources of Elsey Park, Mataranka, N.T. \(nt.gov.au\)](https://www.nt.gov.au/land/resources/elsey-park-mataranka-nt/)

Western Davenport

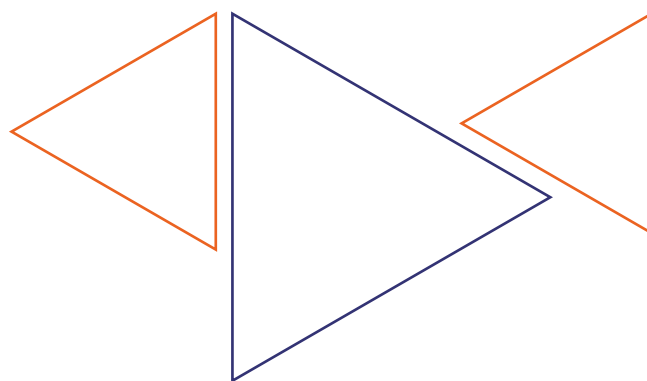
Studies found a variety of soils including predominantly deep, aeolian derived, red earthy sands, sandy-surfaced red earths and level sand plains which are all suitable for a range of irrigated cropping uses. Also present are shallow stony soils, loose dune sands and areas subject to intermittent flooding which are only suited to a limited range of crops.

The water control district of almost 2,450,000 hectares sits over several part portions and water extraction in this area is subject to the Western Davenport Water Control District Water Allocation Plan.

Stuart Highway is the main transport corridor that runs through the centre of the region providing good access to the town centre of Alice Springs approximately 250km to the south, and the capital city of Darwin roughly 1000km from the northern most point of the zone.

Research has identified potential for production of a diverse range of crops including stone fruit, nuts, and temperate subtropical fruits.

A site of conservation significance exists in the northeast portion of this precinct with several threatened species being identified. The preservation area has multiple current management strategies in place including site-specific plans, national recovery plans for threatened species, and numerous threat abatement plans.



References:

[Territory Stories - Soil and Land Suitability Assessment for Irrigated Agriculture in the Ali Curung Area, Western Davenport District](#)
[Territory Stories - Western Davenport Water Allocation Plan 2021-2022 \(nt.gov.au\)](#)

Wildman

The area comprises 26,000 hectares and has been earmarked for agricultural development since the early 1980s.

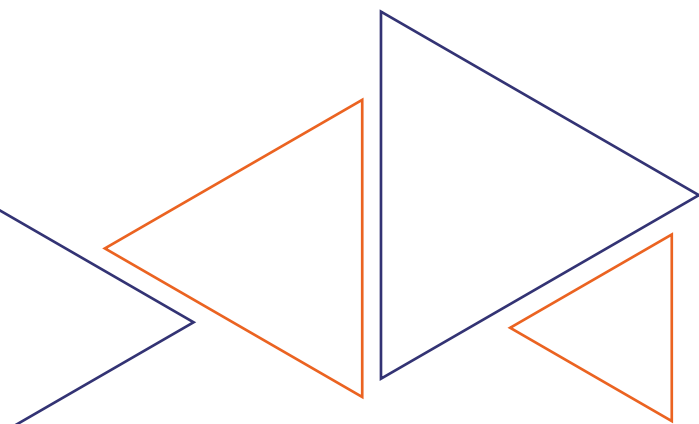
The landforms, vegetation and soils across the site are diverse and include: drainage lines, swamps, low hills and rises, alluvial plains with some clay soils and sandy soil plains of variable depth. A large percentage of soils are greater than 1m depth, some greater than 1.5m deep with a high percentage of the soil types classified as moderate to high land capability for agriculture.

The site experiences high wet season rainfall and is located in a low-risk cyclone area.

Wildman's closest neighbouring communities are Palmerston and Darwin at approximately 115km and 135km respectively. These major centres provide ease of access to excellent community services and resources. Entrance to the site is by sealed road, via the Point Stuart Road which intersects the Arnhem Highway.

The suitable crop types for the site include, but are not limited to: bananas, mangoes, melons, hay/ forage crops, Kakadu plum, rain-fed forestry, beef cattle and buffalo production.

Cattle and agritourism make up some of the agricultural diversity of the greater region.



References:

Water Resources 2016

Soil and Land Suitability Assessment 2016

Results

As a result of the evidence based multi-criteria analysis, the area of Douglas Daly has been prioritised for improved practice in planning and development of sustainable agricultural growth in the Northern Territory.

The next step of the focal case study area will include the identification of cultural and environmental significant areas within the determined area.

This multi-criteria analysis may be further refined,

taking into consideration the feedback and input received regarding the *NT Agribusiness Strategy 2030*. In line with the implementation of the strategy, Territory-wide precinct identification and planning will assist to prioritise detailed and location specific land and water capability studies to build confidence and encourage investment in the industry.

The basis of these learnings provides the opportunity to collaborate with other jurisdictions for the development of Northern Australia.

