ugar
Sustainable Land Use Plan

PART 2

ugar

Kos and Abob and their mother lived originally on Mer (Murray Island).

A supernatural being called Said came from Papua New Guinea and travelled through the islands until he came to the place where Kos and Abob lived.

He seized their mother and took her away, but when the brothers realised what was happening they chased after him.

When Said saw them coming he put the mother into a large woven bag and turned himself into a man-o-war bird (womer), then he flew away carrying the bag. The mother managed to make a hole in the bag and fell from this into the sea where she turned into a stone.

Said flew to Darnley Island, but the brothers paddled after him and chased him around the island and so he flew on to Stephen Island.

Kos and Abob followed him there, but before they could catch him, he flew back to Papua New Guinea.

The brothers could not follow him there and so they stayed on Stephen Island and built the fish traps that line the shore and also built a road on the beach front at Tag.

At the end of this road they placed the stones that are today called Kos and Abob.

Source: Far Northern Schools Development Unit, 1987

Land Use **Plan Structure**

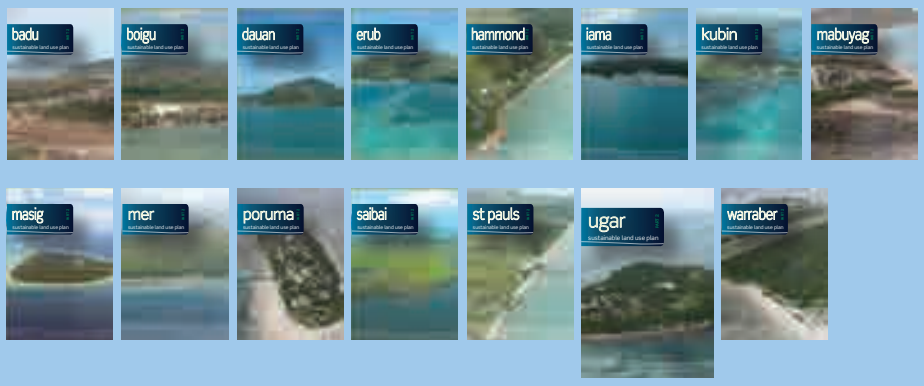
PART 1

Context & Background

- Introduction, Background and Overview of the Torres Strait
- How to Use the Sustainable Land Use Plan

PART 2

Island Overview



A separate section of each island will detail the following topics–

- Island Overview
- Land Tenure & Native Title
- Natural Environment
  - plants, animals and birds
  - coastline
  - tides and storm surge
  - waterways and wetlands
  - land and soil
  - bushfire
- Cultural Heritage
- Community
  - population
  - housing
  - sustainable community expansion
  - community facilities and services
- Infrastructure
  - water
  - sewer
  - waste
  - electricity
  - telecommunications
  - roads
  - drainage
  - air access
  - sea access

Each topic includes best practice principles, an island overview, and an overview of the topic in the context of each island, land use strategies, land use projects, land use considerations, strategic outcomes and useful links.

PART 3

Interim Planning Assessment Process

A non-statutory framework for assessing development on the islands.

Executive **Summary**

In past years, the establishment of new communities and the growth of existing communities has often proceeded in a manner perceived as being unplanned and ad-hoc. Such an uncoordinated approach in remote communities has lead to land management problems such as inappropriate locations of housing and inefficient, costly and haphazard provision of services such as water supply, sewerage, power and roads.

The primary objective of reviewing land uses on Ugar is to provide a support decision-making tool and guideline for the Community to plan for and manage the impacts of future development and that such development is sustainable.

Ugar, commonly referred to as Stephen Island, is an area of significant cultural heritage value to the Traditional Owners and the community. Many sites are not recorded and are only known to the Traditional Owners. Consultation and liaison with Traditional Owners, engagement of cultural heritage observers and preparation of cultural heritage investigations are recommended for all development proposals.

Ugar, is located in the north-eastern group of islands in the Torres Strait approximately 180km north-east of Horn Island and 30km from the coastline of Papua New Guinea.

Ugar Island, the smallest of the inhabited volcanic islands is approximately 700m long and 500m wide and covers approximately 35 hectares. The island consists mainly of a central plateau elevated 20m to 30m above sea level with escarpments on all sides falling away steeply to narrow beaches on the north and south. The community is located on the plateau on the eastern half of Ugar.

Access to the community is difficult, expensive and sometimes dangerous (eg, by dinghy via Darnley Island, or by helicopter). Access to Ugar is predominantly via sea, as no airstrip exists on the island. A helipad has been constructed near the western end of the island and emergency access is available via medivac rescue helicopter (day and night) if required.

The barge access channel was uncompleted in the early 1990's and at low tide, access to Ugar is not possible due to approximately 600 meters of exposed low reef flats.

The **key environmental** assets of Ugar are:

- A large, central vegetated area that is currently in good condition and relatively undisturbed;
- Rehabilitated landscaped areas throughout the village, where native vegetation has been disturbed;
- Mangroves forests (particularly on the west of the island) provide critical niche habitat for specialist species and support a high diversity of fauna (notably birds).

Identified **land issues** are:

- development is generally concentrated in inland areas of the island;
- some development does exist in coastal areas identified as high prone erosion areas, but this is mainly non-residential an is located around the barge ramp;
- no discernible water courses;
- potential acid sulfate soils;
- bushfire hazard;
- the changing system of land tenure;
- limited available land for future expansion of existing residential area due to the possible impact of new areas on the water catchment areas; and
- increasing tide and storm surge levels.

Identified **infrastructure issues** are:

- Development is not to occur in water catchments.
- A target of 300 litres per person per day or less should be achieved by using water efficiently and managing consumer behaviour and demand for water.
- Water supply at Ugar is currently at a level where the collected rainwater and groundwater is sufficient to meet the current demand without the assistance of a supplementary desalination unit.
- On reaching a population of 120 persons and when the target consumption of 300 litres per person per day or less is achieved on a regular basis, an upgrade to the water plant capacity is to be considered. Given the current population is approximately 100 this need could occur between 2014-2019.
- A high growth population increase will see the water supply under capacity. Should this be the case, consideration will be needed to increasing the supply through the addition of a new bore and/or the increase in size of the artificial catchment lagoons. In the short term, the use of a mobile desalination unit may be sufficient to top-up the lagoon during the dry season or periods of lower-than –average rainfall.
- If the requirement for a mobile desalination plant becomes a regular event, a formal plant hardstand area should be constructed, most likely adjacent to the barge ramp.
- Ugar is not currently serviced by a reticulated sewerage system.
- All community sewage is treated via septic tanks and underground absorption techniques.
- The septic tank systems should function appropriately provided they are correctly designed, installed and maintained and that future housing blocks have sufficient areas allocated for the underground trenches.
- There are no immediate plans to construct a reticulated sewerage system at Ugar, at least in the short term.
- Ugar has limited space available for waste disposal.
- Ugar has a waste depot located on the western side of the island, past the helipad. The current waste management practice is a basic trench, burn and bury operation.
- In 2006/2007, an upgrade of the existing waste disposal facilities was undertaken to last 5-10 years, depending on the amount of management and separation of materials that is undertaken.
- There is land available for expansion of the waste depot on Ugar immediately east of the existing waste depot, however it requires the further destruction of vegetation and habitat of the western half of the island.
- A significant issue for all Torres Strait Islands is the impact of disused vehicles once they have reached the end of their usable life. Consideration should be given

to imposing a levy on all vehicles brought onto the island to pay for the ultimate removal of the vehicle from the island.

- Electricity is generated through multiple diesel generator sets (gensets), which are sized to match the load as it fluctuates during the day.
- There are no known issues regarding telecommunications on Ugar.
- Ugar received a major internal road upgrade in 2006 through the provision of concrete pavers throughout the town area. As a result, dust and water ponding have effectively been eliminated.
- The access road to the helipad should be considered for future sealing.
- The road to the southern beach (which also services a single house on the beach) is severely eroded.
- The township is located on elevated land with sloping ground to the surrounding beaches. As such, stormwater generally disperses freely without flooding. There are no defined stormwater pipe systems on the island. Some of the roadways have culvert crossings, which discharge into natural watercourses.
- Access to the community is difficult, expensive and sometimes dangerous (e.g. by dinghy via Darnley Island).
- Due to its small size, Ugar does not have an airstrip for fixed wing aircraft.
- Air access to the island is via helicopter only and a helipad has been constructed near the western end of the island.
- Emergency access is available via medivac rescue helicopter (day and night) if required.
- There is only one potential location for a practical airstrip on Stephen Island.
- The construction of an airfield would require substantial clearing on the southern half of the island and earthworks to level out a height range of up to 8 m.
- The traditional owners advised in 2009 that plans for an airstrip have been abandoned in favour of preserving the environmental quality of Ugar.
- The marine facilities at Ugar consist of a concrete barge ramp located on the northern side of the island and a floating pier adjacent to the ramp.
- A berthing/swing basin has been dredged at the ramp however a channel has not been dredged through the reef, which extends another 600m from the shore. Consequently, barges can only cross the reef at very high tides.
- On low tides, critical cargo often has to be unloaded onto punts to cross the reef and in some cases, barges have had to cancel offloading completely.
- Ugar is serviced fortnightly by a barge service from Port Kennedy, however deliveries can be missed if the tides are not suitable.
- This severely impacts on the community, such as fuel delivery for electricity generation plant for the island, as well as normal vehicle usage.
- As there is no shop on Ugar, food and essential item deliveries need to be planned well in advance.
- Current population is approximately 90 persons (83 persons in 2006);
- In the decade from 1996-2006, population growth has increased at an average annual rate of 3.5%;
- population profile will change over the next 25 years, with a doubling of the 65 plus age group and a decrease of young people; and
- median household size of 3.5 persons.

Identified **housing issues** are:

- 26 houses on Ugar (90 persons, approx 3.5 persons per house)
- existing 10 vacant lots cater for a population growth to over 140 people with current population is 90 people;
- the existing vacant lots are sufficient to cater for the predicted population increase to past 2019;
- the location of the existing vacant, serviced lots influences their sequential development;
- need to use existing vacant lots for either dual occupancies (duplex) or townhouses or units to maximise land availability;
- need to supply diverse, affordable and sustainable housing to meet

population changes and move towards a sustainable environment;

- village needs to have areas designated for denser development outside the areas impacted by natural hazards;
- the investigation areas require studies for the provision of infrastructure and the impact on the water catchment areas.

Identified **growth issues** are:

- a low growth rate of 2% which will generate:
  - an extra 22 persons over ten years;
  - an additional housing of 0.4 houses per year; and
  - an additional 4 houses over ten years;
- a high growth rate of 4% which will generate:
  - an extra 48 persons over ten years;
  - additional housing of 1.0 house per year; and
  - an additional 10 houses over ten years;
- by adopting either, the low or high growth rates, growth pressure on Ugar will be generated;
- based on the existing landfill capacity, Ugar will reach 'full house' in five to ten years;
- options available to manage growth on Ugar are:
  - utilise existing serviced lots prior to encouraging development in the investigation area;
  - to increase residential density; and
  - expansion of the residential areas; and
- studies are required to determine whether the identified investigation area is suitable for development.
- Together the identified assets and issues above provide the basis for land use strategies, questions to ask for any proposed development and key land use outcomes.

In summary:

- vacant land will be consumed in ten years or more;
- Ugar's current infrastructure (water) will limit Ugar population growth between 2012 and 2017;
- The community must decide how they are going to adjust development on Ugar for climate change. What strategies are they going to adopt?
- if further development is to occur it:
  - should not be permitted in any area:
    - identified as an environmental asset;
    - identified as water catchment or in a known water catchment area;
    - encompassing head waters of waterways and wetlands;
    - where it has detrimental impact on natural flow regimes and quality water systems;
    - in areas affected by tides and storm surges;
    - in areas of medium bushfire risk or part of areas identified as medium bushfire risk;
    - near major infrastructure such as the Telstra Tower, sewerage treatment plants and generators;
    - identified as affected by natural hazards such as tides, storm surges or acid sulfate soils; and
    - adjacent to areas identified as subject to high prone erosion.
  - should be contained with the village and the identified investigation area which will require an increase in residential density;
  - must include diverse, affordable and sustainable housing to meet the needs of current and future residents and visitors. One area is to be investigated for potential development; and
  - must incorporate all processes, policies and decisions that protect and enhance the natural and made environments including cultural values and beliefs.

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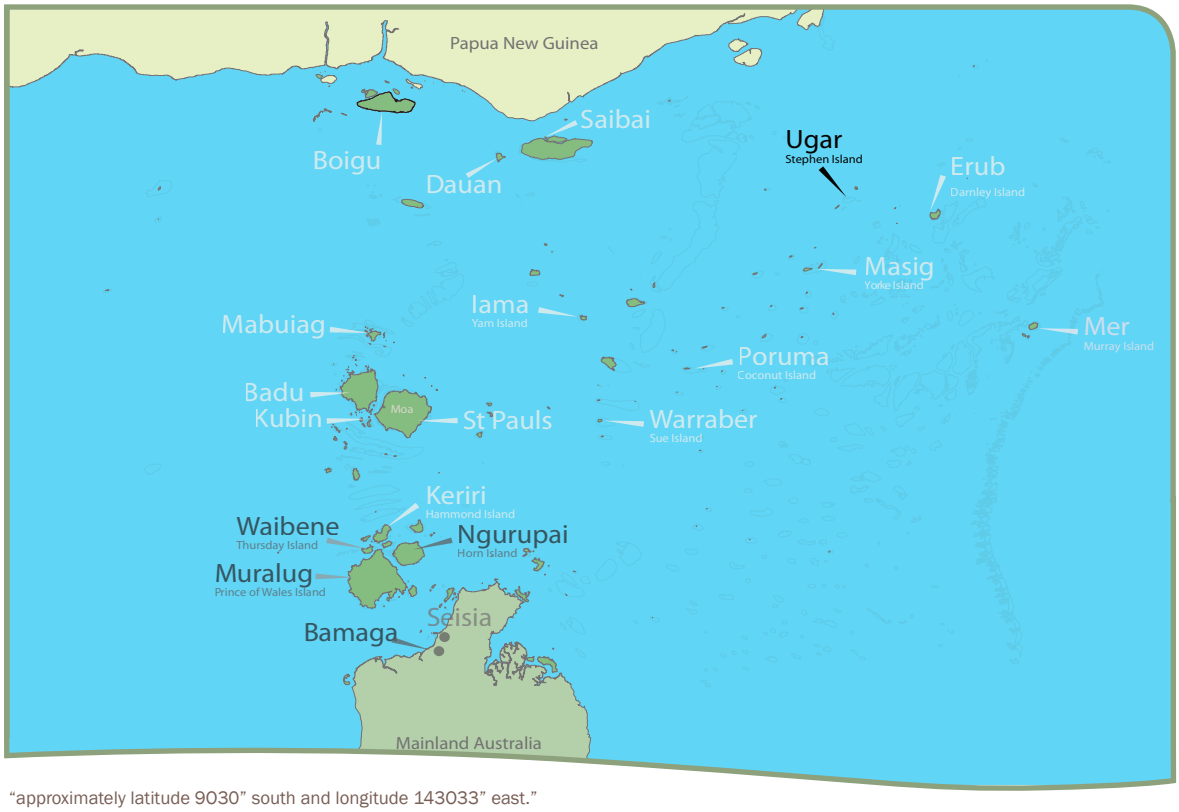
Island **Overview**

1.1 Location

Ugar, commonly referred to as Stephen Island, is located in the north-eastern group of islands in the Torres Strait approximately 180km north-east of Horn Island and 30km from the coastline of Papua New Guinea.

Map 1 shows the location of Ugar in relation to the Torres Strait region.

Map 1 Regional Location



"approximately latitude 9030" south and longitude 143033" east."

Map 2 Satellite Image of Ugar

For more detail, refer to Map No 9964-1400 contained in Maps.

1.2 Physical Characteristics

The following is an overview of the physical characteristics of Ugar.

1.2.1 Topography

Ugar is smallest of the inhabited volcanic islands in the Torres Strait and is approximately 700m long by 500m wide, covering a total area of approximately 35 hectares.

Ugar consists mainly of a central plateau elevated 20m to 30m above sea level with escarpments on all sides falling away steeply to narrow beaches on the north and south. The island also falls away more gradually towards the west to a third beach. The central plateau shows a weathered mantle of red clay to depths greater than 10m.

Map 2 shows a satellite image of Ugar.

1.2.2 Geology

Ugar is a remnant Pleistocene volcano and therefore has rich red soil. It comprises the eroded remnants of a previously more extensive volcanic plateau of basaltic lava (Stanton et al 2008). This volcanic activity has been relatively recent (Pleistocene Age, >1.8Ma).

1.2.3 Vegetation

The rich red soil of Ugar supports dense vegetation, where it has not been cleared. A significant amount of the island's tropical vegetation (approximately 60m wide by 400m long) was cleared in 1986, supposedly for a future airstrip. However, the orientation of this clearing was not suited for the construction of an airstrip as it was at approximately 45 degrees east of north, and any airstrip in that location would, at most times, be subject to direct cross winds from the prevailing north-west and south-east winds.

Currently, intact vegetation on Ugar is configured as a mosaic across the island. In several instances, the undisturbed vegetation patches combine with disturbed areas in a state of regeneration to form large tracts of vegetation. Where this is the case, it is apparent that the disturbed patches support comparable fauna diversity to their contiguous undisturbed patches. Thus a 'node' of vegetation is created where disturbed and undisturbed patches are of similar importance and combined, representing a significant habitat resource.

1.2.4 Waterways, Wetlands and Coasts

On Ugar, there are no discernible watercourses, defined rivers or stream channels.

1.3 The Village

The community is located on the plateau on the eastern half of Ugar and consists of Council offices, Community hall, basketball stadium, School, Health Clinic, Church, Freezer, and approximately 26 houses.

Water for the island is sourced from rainfall and two bores feeding into a covered water storage located in the centre of the island. Electricity is generated by diesel motors and the properties dispose of sewerage by septic systems.

There are four points of access to the island being:

- The main barge ramp and wharf located on the northern foreshore;
- The beach located on the southern foreshore;
- A very small beach located on the western foreshore; and
- A concrete helipad located on the north-west side of the island approximately 250m from the centre of the community.

The island is too small to construct an airstrip, so all goods including food and fuel are delivered by seabarge. However the dredging of a sea access channel in the early 1990's was ceased during construction, leaving a 500m portion of undredged reef exposed at low tide. Seabarge's can therefore only deliver goods at high tide which regularly affects the community.

Map 3 shows a satellite image of Ugar Village.

1.4 Population

The 2006 Census shows the total population of Ugar as 83, an increase of 22 persons (26.5%) from the 2001 Census (61).

The growth rate was 6.4% or 4 persons per year in the 5 years between 2001-2006.

The growth rate was 3.5% over the 10 years to 2006.

Map 3 Satellite Image of Ugar Village

For more detail, refer to Map No. 9964-1400 contained in Maps.


Land Tenure & Native Title

2.1 Land Tenure

2.1.1 Best Practice

- Recognise ownership of traditional lands.
- Understand land tenure systems, particularly customary systems, when development land.
- A co-operative approach between all parties to land tenure, native title, development and land-management issues.

2.1.2 Overview of Current Situation

Ugar legal land tenure consists of a Deed of Grant in Trust (DOGIT) shown as Lot 7 on TS174, Parish of Umaga, County of Torres in the State of Queensland.

As the land is held in DOGIT, the term 'lot', in this Plan refers typically to the land surrounding a house or a building.

General the DOGIT covers most of the community including houses, council officers, shops and some roads and general infrastructure.

At the time of granting the DOGIT, some land was retained by the State of Queensland for specific purposes. Generally, these reservations were minor and may include land such as airstrips, some roads and community facilities such as schools. A search of the State government's land tenure system is required to determine the extract tenure of the land.

The Torres Strait Island Regional Council (TSIRC) is currently the trustee of the DOGIT, acting on behalf of the Torres Strait Islanders of the community. Council may issue leases over part of the DOGIT for various specific purposes including leases for infrastructure purposes (e.g. Telstra and Ergon Energy), Australian Customs Service facilities, health centres and commercial purposes. The existence of these leases is disclosed by searching the state's tenure database.

2.1.3 Issues Overview

Discussion is required with Traditional Owners and the TSRIC with regard to approval for the provision of new development and infrastructure on the island. However, consideration must also be given to those members of the community who do not possess traditional land, to ensure they and their families have adequate opportunities to access housing.

The Aboriginal and Torres Strait Islander Land Amendment Act 2008 was passed by the State government on 13 May 2008. The amendments in the Act aim to:

- encourage home ownership and provide long term leases for housing;
- assist the transfer of land not required for village purposes (outside of townships) to Indigenous land trusts;
- encourage economic development in Indigenous communities; and
- facilitate the construction of public infrastructure by providing a compulsory acquisition process.

This Act may change the land tenure on Ugar and once in effect must be monitored.

2.1.4 Sustainable Land Tenure Outcomes

- Consultation with the TSIRC, Native Title Prescribed Body Corporate, Land Trusts and Traditional Owners occurs on a regular basis with their knowledge and values respected.
- Communities are is the best position to identify and priorities their needs and recommend how governments can best meet those need.

2.1.5 Useful Resources

Legislation

Aborigines and Torres Strait Islanders (Land Holding) Act 1985 (Qld) outlines the process for providing the grant of leases in perpetuity and other land to members of Torres Strait Island Communities.

www.legislation.qld.gov.au

Land Act 1994 (Qld) deals with the administration and management of non-freehold land and DOGIT and the creation of freehold land.

www.legislation.qld.gov.au

The Aboriginal and Torres Strait Islander Land Amendment Bill 2008 amends the Aboriginal Land Act 1991, the Torres Strait Islander Land Act 1991, the Land Act 1994, the Local Government (Aboriginal Lands) Act 1978 and the Native Title (Queensland) Act 1993.

www.legislation.qld.gov.au

Torres Strait Islander Land Act 1991 (Qld) provides for the grant and claim and grant, of land as Torres Strait Islander Land and for other purposes.

www.legislation.qld.gov.au

Native Title Act 1993 (Cth) provides for the recognition and protection of Native Title rights and interest and establishes mechanisms for how future development and actions affect Native Title.

www.comlaw.gov.au

Policies, Guidelines and Fact Sheets

A Guide to Land Tenure in Queensland outlines the types of tenure used in Queensland, including DOGITs, their characteristics and the various provisions of legislation, which apply to each.

www.nrw.qld.gov.au/land/state/publications

Websites

Department of Environment & Resource Management

www.derm.qld.gov.au

2.2 Native Title

2.2.1 Best Practice

- Native title should respect, protect and identify the community's cultural heritage for present and future generations.
- A co-operative approach between all parties to land tenure, native title, development and land-management issues.
- Establish communication prior to starting a project to ensure inclusion and participation – involve the community in genuine negotiation at every stage of a project.
- Be sensitive of issues of language, naming and expression.
- Examine assumptions carefully – ask first, do not assume.
- Be informed about appropriate times to undertaken consultation and negotiation - be respective fully of deaths in communities and cultural events.

2.2.2 Overview of Current Situation

Ugar is the subject of several Native Title applications over the island, foreshore and the surrounding waters. The claims were lodged by Joseph Stephens and others on behalf of the people of Ugar, with the Torres Strait Regional Authority acting on behalf of the claimants.

Native title rights are held by the Ugar People as determined by a consent determination on 9 December 2004[1], being to the Ugar People, being

- the members of the Bann, Mait, Kennell, Williams, Stephen, Cloudy, Baker, Oroki and Wacando families who are descended from the following apical ancestors: Baniam, Zanny, Maima or Jack Oroki; and
- Torres Strait Islanders who have been adopted by the above people in accordance with the traditional laws acknowledged and traditional customs observed by those people.

Native title is managed via the Ugar Ged Kem Le Zeuber Er Kep Le (Torres Strait Islanders) Corporation.

A native title sea claim is yet to be determined.

As of October 2009, the National Native Title Tribunal records indicated there were two Indigenous Land Use Agreements (ILUAs) applicable to Ugar:

- Ugar (Stephen Islanders) ILUA (No. QI2004/041 - Infrastructure); and
- Ugar Island - Ergon Energy ILUA (QI2004/052 - Access)

Communication with the relevant Native Title Prescribed Body Corporate (PBC) will assist developers to identify local areas and objects of significance and avoid or mitigate disturbance. The Torres Strait Regional Authority (TSRA) through its Land and Sea Management Unit (LSMU) and Native Title Office can assist in contacting the relevant PBCs. The TSIRC will also be able to help with identifying the correct PBC contacts.

1 Stephen on behalf of the Ugar People v Queensland [2004] FCA 1574

Map 4 Tenure Plan

For more detail, refer to Map No. 9964-1419 contained in Maps.

2.2.3 Issues Overview

Final decisions over native title claims can take time and it is essential to continue the provision of infrastructure to communities whilst a native title claim is being determined.

The Native Title Act 1993 provides a system or process to facilitate dealings that may affect native title. Both during the claim process and after native title is recognised.

Native title claimants and those recognised as native title holders have the right to negotiate about some future acts, such as the proposal of a proposed development. As native title has been determined, a PBC has been established to represent native title interests. In many cases, an agreement is made between the PBC, the TSIRC and the proponent of the development to allow a development to proceed. Such developments have typically included the provision of major infrastructure such as reticulated sewerage schemes, or areas of land for subdivision expansion.

Enquiries should be made with the PBC, the TSIRC and or the TSRA's Native Title Office to determine is there are any existing agreements.

Indigenous Land Use Agreements

ILUAs are voluntary agreements about the use and management of land and or water made between a native title party and other people who have an interest in the land and or water covered by the claim such as pastoralists, farmers, resource explorers and producers, fishers, local government and State government officers. ILUAs are registered with the National Tribunal making them legally binding on the people who are parties to the agreement and all native titleholders for that area. ILUAs achieve certainty over access to and sustainable use of land, water and resources through negotiated recognition and just settlement leading to the resolution of native title claims.

Map 4 shows the tenure and native title interests over the community.

2.2.4 Sustainable Native Title Outcomes

- Consultation with the Prescribed Body Corporate, Land Trusts and Traditional Owners occurs on a regular basis with their knowledge and values respected.
- ILUAs are encouraged, implemented and respected.
- Promotion of effective communication and transparent processes that are flexible to reflect particular circumstances of the community.

2.3 Useful Resources

Legislation

Native Title Act 1993 (Cth) provides for the recognition and protection of Native Title rights and interest and establishes mechanisms for how future development and actions affect Native Title.

www.comlaw.gov.au

Indigenous Land Use Agreements

National Native Title Tribunal
www.nntt.gov.au

Policies, Guidelines and Fact Sheets

Guidelines for Negotiation of an Indigenous Land Use Agreement provides information on negotiating and registering an ILUA including the different types of ILUAs, the steps for negotiating an ILUA and the process for registering an ILUA. It also includes a sample ILUA.

www.nrw.qld.gov.au/publications/nativetitle

Websites

Department of Environment & Resource Management
www.derm.qld.gov.au

National Native Title Tribunal

www.nntt.gov.au

Natural **Environment**

The natural environment, or the land and sea, is the core of Torres Strait communities' way of life, both now and in the future. Its existence, condition and health are essential to community health. Their future, economy and way of life cannot be separated from how the land and sea is managed.

Land and sea is so fundamental to Ugar community that the impacts on land and sea must be part of all decisions and plans.

This Plan addresses the following with regard to the natural environment:

- plants, animals and birds;
- coastline;
- tides and storm surges;
- waterways and wetlands;
- land and soil; and
- bushfire.

A report by RPS Environmental Scientists was undertaken on Ugar over a five day visit in early 2009. This report provides a snap shot in time and a base line for future studies and identified key natural assets, habitats, watercourses and natural land use issues for Community. It is not intended to be a complete scientific analysis of Ugar's natural environment. The report is written for the Ugar Community, the TSIRC and the TSRA.

The Fauna and Habitat Assessment of Ugar, prepared by RPS Environmental Scientists, is included as Appendix 1.

Mapping of the Torres Strait regions remnant vegetation was undertaken in 2007/08 by 3D Environmental. The study identified vegetation communities across all islands and was undertaken to provide data suitable for adoption under the old State remnant vegetation regime administered by the Department of Natural Resources and Water (NRW). By late 2008, the draft mapping being provided by NRW had been completed but not made available to the public.

The Vegetation Communities and Regional Ecosystem Assessment, prepared by 3D Environmental, is included as Appendix 2.

3.1 Plants, Animals and Birds

3.1.1 Best Practice

- The present generation ensure the health, diversity and productivity of the plants, animals and birds is maintained or enhanced for the benefit of future generations through:
  - the protection and conservation of native plants, animals, birds, habitat and habitat corridors;
  - conservation efforts focus on those plants, animals and birds which are uncommon and at risk;
  - clearing of native vegetation, which results in the loss of uncommon, at risk or threatened plants or the animals and birds that live in those areas, is minimised;
  - using renewable natural resources sustainably and sensibly without significantly impacting other land uses;
  - managing animals, pests, weeds and disease so that their impact on the land and sea is minimised or avoided; and
  - integrating land and sea planning and management to ensure the negative impacts of human actions (e.g. development, vegetation clearing) on plants, animals and birds is minimised or prevented.
- The pattern of development on the community recognises the importance of plants, animals and birds, natural resources and their fundamental relationship to the quality of life and viability of the community and the wellbeing of its residents.
  - Reduce the impacts of climate change on plants, animals and birds by:
  - recognising the importance of climate change on plants, animals and birds of the community;
  - avoiding decisions now that will make it more difficult to manage the impacts of climate change in the future; and
  - building understanding and knowledge of the community to address the impacts of climate change on the island's plants, animals and birds.

3.1.2 Overview of Current Situation

The land and sea of Ugar is the home or habitat of a range of plant and animal species. Aside from Traditional Owners' knowledge and the literature regarding birds of the Torres Strait, the terrestrial fauna is poorly known and recorded. Most notably, the Queensland and Australian Museums did not hold any voucher specimens taken from Ugar prior to this study.

It is assumed that the limited extent of terrestrial fauna studies completed on Ugar is an artefact of the logistical difficulties associated with travelling to the island. The preliminary fieldwork undertaken by RPS Environmental Scientists is part of the ongoing process of recording and identifying significant habitat, plants, birds and animals on Ugar.

Notable rare and threatened fauna observed on Ugar include:

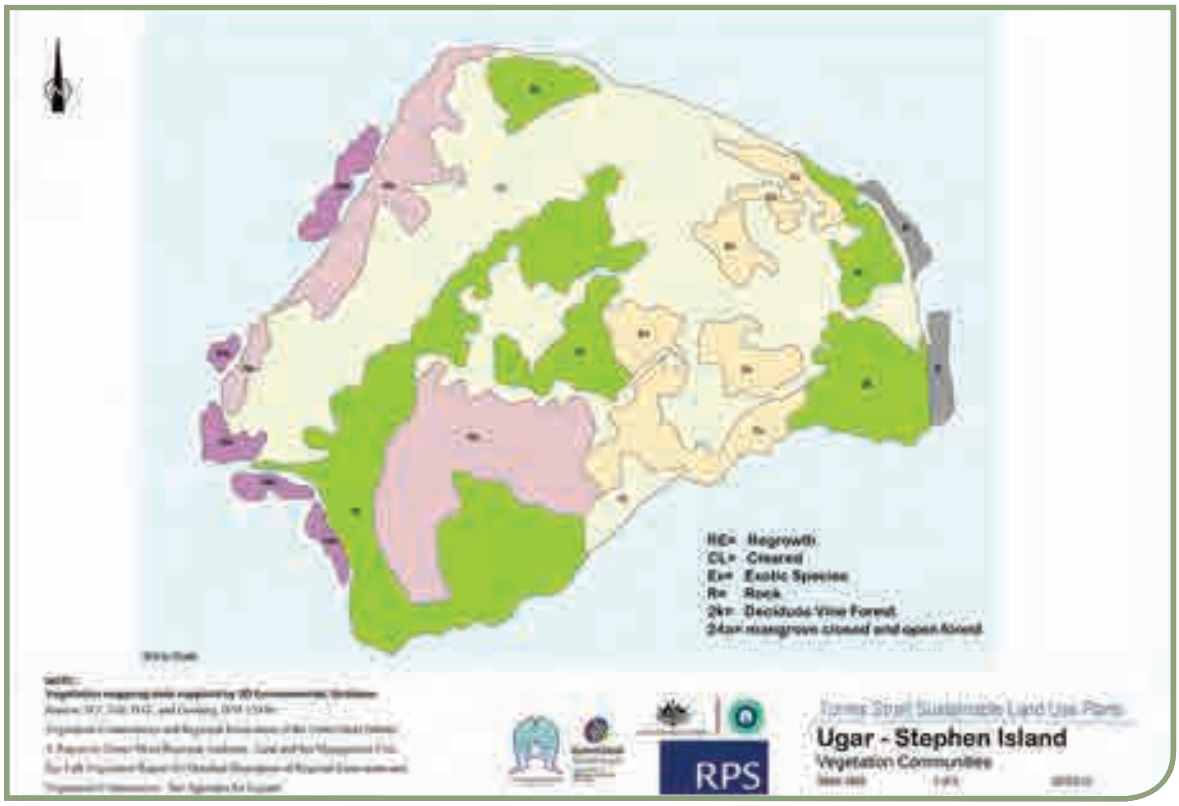
- Mangrove Skink (Emoia atrocostata) – listed as rare under the Nature Conservation Act 1992 (NCA) and found most often in intertidal habitats where mangroves are present.
- Eastern Curlew (Numenius madagascariensis) - listed as rare under the NCA.
- Little Tern (Sterna albifrons) – listed as endangered under the NCA.

In addition to the species identified in background searches and field studies, consultation with community members indicated that some species may be missing from the inventory. One anecdote suggested that for a short period in the previous year, a large number of megachiropteran bats were observed on the island. Another account indicated the presence of a species of tree snake on the island, most likely common tree snake, Dendrelaphis punctulata). These species are likely to be considered 'common' species under the EPBC Act and NCA and thus are unlikely to significantly alter perceived habitat values on the island.

Further details on habitat and fauna are included as Appendix 1.

Map 5 shows the significant vegetation communities on Ugar.

Map 5 Vegetation



For more detail, refer to Map No. 9964-1405 contained in Maps.

"Plants, animals and birds are essential to the well being of the community as they are frequently associated with cultural significant activities and events. So, significant plants, animals and birds and their habitat need to be protected as they are part of the history and the future for the next generation."

The notable ecological and habitat features of Ugar are the:

- coastal environment, which comprises beaches, sand flats, rocky shorelines and mudflats;
- mangrove vegetation; and
- forest habitat, particularly two large patches of vine forest vegetation on the south western and south eastern corners of the island.

Four habitat types were identified on Ugar, including:

Mangroves

Small areas of littoral mangrove forests and vegetation occur on the western side of the island. Mangrove forest was generally noted as having few signs of disturbance. All mangrove forest on Ugar was considered to be high quality and structurally well-developed.

High fauna diversity in these areas is an artefact of the convergence of terrestrial forests, mangrove forest and marine/intertidal habitats providing a wide array of ecological niches and resources. The result is the presence of obligate mangrove specialists such as striated heron and mangrove golden whistler as well as opportunists such as chestnut manikin and migratory wading birds.

Mangrove habitats also supported a significant representation of the reptile species recorded for Ugar. Most importantly, one species recorded within this area (Emoia atrocostata) is listed as 'Rare' under the NCA. This skink is a specialist within inter-tidal environments. On Ugar, the species was regularly encountered, most often in intertidal habitats where mangroves are present and the shoreline is characterised by heavier saline muds.

Vine Forest

Terrestrial portions of the island support vine forest as the dominant vegetation type.

Historical land uses including village gardens, dwellings and clearing for an airstrip have resulted in a matrix of areas of structurally intact forest intermingled with various stages of regrowth and weed dominated areas.

This forest type has deciduous elements in the canopy, the leaf fall of which significantly contributes to ground layer habitat. The litter also contributes to the fertile basalt soils and the development of an organically rich soil veneer.

A large proportion of species recorded on Ugar Island including birds, mammals, reptiles and frogs were confirmed as being present within vine forest vegetation. The deep leaf litter layer in particular, provides an ideal habitat for reptiles. Six of the 10 species of reptile known to occur on the island were recorded within vine forest areas. Bar-lipped Sheen Skink (Eugongylus rufescens) was noted as a particularly abundant species within this habitat type.

Coastal Environments

(including: beaches, sand flats, rocky shorelines and mudflats)

Sand beaches and boulder-strewn flats define the main structural attributes of this habitat group. This habitat provides good roosting and foraging locations for waders and oceanic birds, some of which are migratory species. Notable species observed foraging along beaches and rocky areas include whimbrel and Pacific golden plover.

The sand spit at the south-western end of the island forms an exceptional habitat feature for wading bird species and serves as an important high tide roost for these species.

Coastal zones of Ugar Island potentially hold special importance for a range of conservation significant birds including Little Tern (Sternula albifrons) and Eastern curlew (Numenius madagascariensis).

Shoreline habitats, in addition to mangroves, also provide habitat for Emoia atrocostata, a skink listed as Rare under the NCA. This species was frequently encountered amongst basalt boulders and saline mud flats of the coastal environment.

A total of 21 species of birds were recorded from coastal habitats: this represents 58% of the total bird species recorded from the island during this survey, and thus the most diverse habitat on Ugar. Subsequently, the area should be afforded a commensurately high conservation status.

Modified Environments

(including but not limited to: built areas, gardens, disturbed vegetation, the rubbish tip and non-indigenous vegetation)

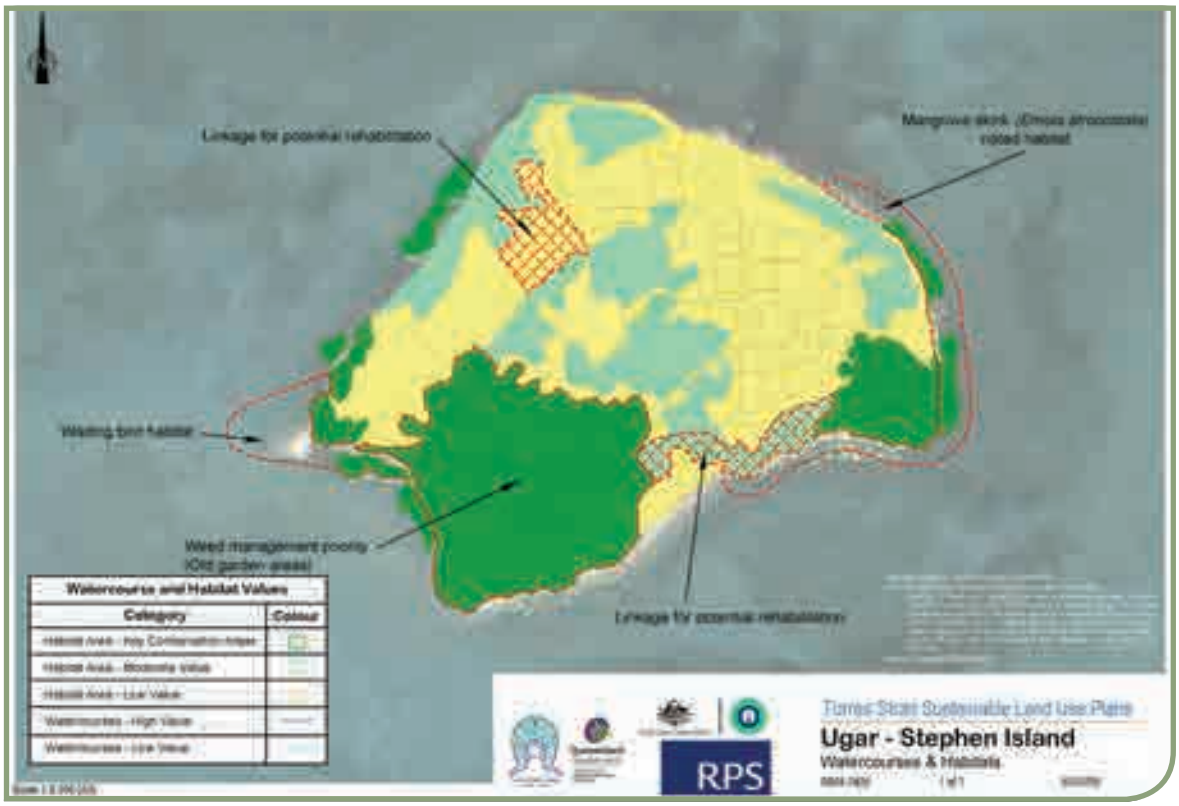
Twenty-six of the species recorded on Ugar were present within developed environments.

This surprisingly high diversity can potentially be attributed to the extensive amount of time spent within developed environments. The survey team resided within the community during the survey period and habitually passed through developed areas whilst traversing between study sites. This afforded an extended opportunity to document fauna species present.

Alternately, this perceived diversity may also provide a useful indication as to the ecology of fauna species that inhabit Ugar. Being a relatively small island with limited habitat niches, Ugar accordingly supports an assemblage of generalist fauna that are able to utilise a wide array of habitats. These species are well equipped to exploit opportunities provided within developed areas.

Map 6 shows the habitat areas on Ugar.

Map 6 Significant Watercourses & Habitats



For more detail, refer to Map No. 9964-1406 contained in Maps.

3.1.3 Issues Overview

"Habitat areas are the different places that plants, animals and birds live and grow. Habitat areas provide food, water and shelter for plants, animals and birds."

The remaining and distinct vegetated character of Ugar relies on the retention of biodiversity and ecosystems. In addition, many of the fauna species identified on Ugar are habitat specific or specialist animals – often requiring particular resources to persist in a given environment. The presence of threatened birds highlights the regional significance of Ugar to provide high quality habitat and long-term safe refuge for species of conservation importance.

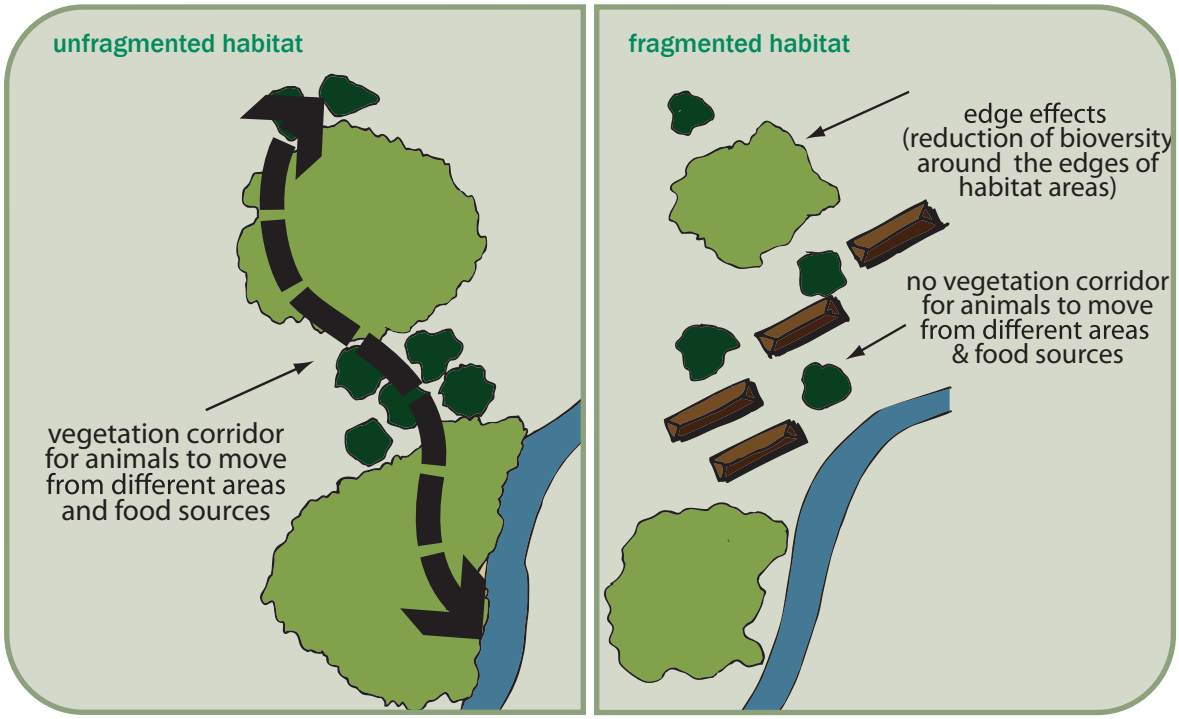
For these reasons, it is vital that land must be protected for conservation purposes.

"biodiversity (biological diversity) is the variety of all life forms, including the different plans, animals and micro-organisms, the genes they contain and the ecosystem of which they form a part of"

The main risk to continued health and diversity of local species is from continued fragmentation and disturbance of the existing habitat and the introduction of weeds and pests.

Figure 1 shows the effects of fragmentation on vegetation

Figure 1 Vegetation Fragmentation



"fragmentation is caused when vegetation and habitat areas are cleared resulting in these areas being divided into smaller, isolated patched"

The fauna survey located derelict terraced gardens on Ugar, dominated by Cassava (Manihot esculenta), which have become progressively overgrown with vine forest successionary species and exotic creepers.

It was also observed that the introduced Mango tree (Mangifera indica) is ever present across the island and throughout remnant vine forest vegetation – no doubt a result of it being deliberately planted because of its desirable edible qualities. It is unlikely that Mangoes are regularly dispersed by fruit bats as they do not appear to permanently inhabit or visit the island.

Mangrove vegetation, particularly where the forest architecture is developed, as well as the vine forests over the central sections of the island were identified as two key habitat types. The fauna that occupies habitat within mangrove forests, nearby beaches and sand flats, are dominated by birds. A large proportion of these birds are migrant waders, for example: red-neck stints, greater and lesser sand plovers and grey-tailed tattlers and thus this habitat is of particular importance. Emoia atrocostata (listed as Rare under the NCA) was also recorded within this habitat.

The coastal environment of boulder strewn beaches and sand flats represents an additional, third key habitat type. This habitat, in a similar manner to mangrove forests, hosts species listed as rare and threatened and/or migratory under Queensland and Commonwealth legislation. Emoia atrocostata (listed as Rare under the NCA) was once again recorded within this habitat type and although not recorded during the survey period, additional rare and threatened species are presumed to occur within this habitat seasonally. These include Eastern Curlew (Numenius madagascariensis) (Rare, NCA) and Little Tern (Sterna albifrons) (Endangered, NCA).

The presence of rare and threatened species within coastal habitats is most likely biased towards shoreline areas that are isolated from regular perturbations from the village area (e.g. roaming dogs and boat traffic). The sand spit

located at the south-western corner of the island is one such area.

The elevation of this habitat area above the general high tide range also means it is likely to function as a crucial high tide roosting area for migratory and rare and threatened bird species. Generally, the entire shoreline habitat of Ugar is considered to have exceptionally high environmental value. The importance of this coastal habitat to the conservation of relatively pristine conditions is of critical significance to the long-term preservation of the island's natural and scenic integrity.

"Generally, the entire shoreline habitat of Ugar is considered to have exceptionally high environmental value"

Shipping is a primary vector for the introduction of terrestrial species to the islands. Anecdotal information suggests that Green Tree Frogs (Litoria caerulea) have come onto the island within the last 12 months with construction materials shipped in on barges.

The focussing of development activities from the central community area in the east across the northern section to the helipad in the west has meant that the southern portion of the island has been left largely intact. Two large patches of vine forest vegetation were identified during the field assessment, on the south western and south eastern corners of the island. This forest (a sub-unit of which is identified by Stanton et al 2008 as unique to the Torres Strait) is in good condition and provides broad, continuous tracts of important wildlife habitat to the southern coastline of the island.

Despite the scattered incidences of anthropogenic modification, such as relic gardens and patches of introduced bamboo and cassava, the structural integrity and range of habitat attributes is a crucial natural asset to the island. Accordingly, they have been identified as being of high habitat value. The concentration of the village area on the eastern of the island has by default, constrained impacts to the immediate vegetation. These impacts are not considered to be severe, although the cumulative effect of low intensity impacts is difficult to quantify in the short-term.

The retention of larger habitat tracts should however be considered essential for the conservation of a number of species including litter skinks such as Glaphyromorphus crassicaudus and Carlia macfarlani as well as birds such as Spectacled Monarch. Retaining ecological connection between such patches will also effectively increase the overall habitat area for such species, greatly benefiting long-term survival probabilities.

As the two largest tracts of intact vegetation are situated at opposite ends of the island, maintaining a vegetated connection between these patches is a worthwhile objective. At present, an area of vine forest does span between them along the southern extent of the island.

This vegetation is somewhat disturbed and without consideration of this potential connective function, it is likely the area would have been afforded a lower habitat value. Conservation and rehabilitation of this vegetation should be a secondary conservation priority on the island subsequent to the preservation of existing high value vegetated areas.

No watercourses of significance were identified on Ugar. Some drainage areas were subject to erosion particularly where roads direct stormwater. Stabilisation and diversion of stormwater from these areas is recommended.

The heavily disturbed area spanning across the northern portion of the island from the village to the helicopter pad represents the area of the island with least ecological constraint to future development. Previous clearing for the construction of an airstrip has produced a recessed vegetation community dominated by weeds.

Weed and pest control is also required to protect the localised ecological health and community wellbeing (over-population of stray dogs was reported to be problematic on the island). Control of these animals could be conducted through periodic culling of stray dogs; as well as placing limits on the numbers of pets allowed to be kept by island residents.

Perhaps the most influential introduction acting upon the fauna diversity of Ugar presently, is that of the domestic dog (Canis lupus familiaris). Dogs were observed to be ever present across all parts of the island and the potential for modification of faunal assemblages via predation should be noted.

3.1.4 Land Use Strategies

To minimise existing and future development on Ugar's plants, animals and birds, the following strategy is recommended:

- Those areas that are of critical environmental significance, host rare and endangered species, are in pristine condition and corridors that provide for the safe movement and successful breeding of wildlife should be protected:
  - from development; and
  - with a buffer of peripheral plantings of dense tree species to minimise encroachment into adjacent areas.

The heavily disturbed area spanning across the northern portion of the island from the village to the helicopter pad represents the area of the island with least ecological constraint to future development. Previous clearing for the construction of an airstrip has produced a recessed vegetation community dominated by weeds.

Areas of greatest conservation priority include large nodes of vine forest on the south western and south eastern extents of the island and coastal habitats including mangrove forest.

As development on Ugar is heavily constrained by the overall size of the island it is expected that land designated for future development and other uses could easily conflict with the environmental values of neighbouring undeveloped sections of the island.

Such conflict should be managed appropriately and in consideration of several planning parameters – not least of which will be the conservation significance and status of the proposed regional ecosystem mapping undertaken recently by Stanton et al (2008).

Several factors that could arise from new settlements in these areas are the introduction of dogs (already identified as problematic on Ugar and other inhabited islands in the Torres Strait), as well as a range of other detractions that are alien to the landscape (weeds, rubbish, wood collecting, vegetation thinning, localised

pollution, improper waste water management and so on).

Key environmental principles to be employed and considered when planning for future development of new portions of land include:

- Maintain vegetation continuity and connectivity throughout remnant vegetation, and particularly to the southern sections of the island.
- Minimise edge effects and the radiation of impacts by clustering residential development in newly allocated zones.
- Instate densely landscaped peripheral plantings of plants native to Ugar to minimise human encroachment into natural areas.
- Consideration of revegetation and rehabilitation of disturbed vegetation area as well as the establishment of other vegetated linkages where opportunities exist as shown in Figure 1.

A summary of the general conclusions and environmental principles that should be adopted is provided to assist with planning activities. The prominent environmental values and activities or considerations include:

- Mangrove and coastal environments provide complex habitat values that are of high environmental significance as ecological habitat and for maintaining marine and terrestrial biodiversity.
- Habitat for the rare skink (Emoia atractocostata) is in a stable condition and habitat are unlikely to be subject to development pressures however should be assessed with respect to any impacts for marine works such as channel dredging or building of rock groynes when they are proposed.
- Development is located in a constrained area in the current village location. Opportunities exist for controlled development of or adjacent to the abandoned airstrip.
- Mangrove habitat on the island is of limited area and it is recommended that development does not significantly alter the coastal protection afforded by this vegetation type. No net loss of mangrove forest should occur as a result of development.
- Buffers to marine habitats (e.g. a minimum 40 metres separation from mangrove and associated vegetation) are recommended for protection of aquatic values and mangrove forest health.
- Dog and cat numbers should be controlled and regulated through destruction of stray animals and the implementation of a requirement for reduced household pet numbers.
- A monitoring program for introduced animals from shipping activities to prevent pest introduction (such as introduced rats that also have an economic impact with respect to their control).

3.1.5 Land Use Considerations

In assessing the impacts of future development on Ugar, the following key questions are to be raised. If the answer to any of the questions is 'NO', the proposal must, a) justify the inconsistency, b) be amended, or c) not be accepted.

- Is the development in accordance with the Plants, Animals and Birds Best Practice, Land Use Strategy and Sustainable Outcomes?
- Has the development addressed its impact on the natural environment of Ugar?
- Does the development fragment affect the Areas of greatest conservation priority, includingthe large nodes of vine forest on the south western and south eastern extents of the island and coastal habitats including mangrove forest.
- Has a minimum of 40 metres buffer been provided between the development and marine habitats and coastal vegetation (the buffer areas should consist of be coastal vegetation)?
- Is the development outside of areas identified for conservation particularly in areas such as forests in the western area of Ugar, along the southern and eastern tip of the island and the area south of the water storage area?
- Where new corridors are being created as part of a revegetation program do they:
  - have a minimum width of 50 metres
  - link remnant areas of bushland habitat
  - provide landscape connectivity
  - propose to revegetate using seed collected from plants that are indigenous to the Island
  - use plants grown from the area being revegetated
  - introduce inappropriate non-indigenous plants into the natural areas
  - propose to control weed growth and remove areas of infestation?
- If development is being proposed in the village, or around existing infrastructure or in proposed investigation areas:
- are buffers, a minimum of 50 metres wide being provided between the development and the area requiring protection
  - does the proposed landscaping use plants native to Ugar
  - will it introduce inappropriate plants into the natural areas
  - does it propose to control weed growth and eradicate areas of infestation?
- Does the development impact on the rare or endangered species?

3.1.6 Land Use Projects

To minimise current and future impacts on Ugar plants, animals and birds, the following projects are recommended:

- Revegetate around the perimeters of existing development, landfill and infrastructure, with densely landscaped peripheral plantings of native plants be planted to minimise human encroachment into natural areas
- Provide buffer zones between human settlement and wading bird habitat.
- Implement a cat and dog management plan
- Implement a weed management plan
- Investigate revegetation of the old terraced garden areas in the southwest of the island

3.1.7 Sustainable Plants, Animals and Bird Outcomes

- The unique environmental values of the community are maintained and enhanced for current and future generations.
- The ecologically significant systems, sensitive coastal systems, areas identified as rare, endangered or vulnerable or environmental value are preserved and protected for nature conservation, landscape/scenic quality, biodiversity and habitat values, to ensure the integrity of natural processes.
- Sustainable development practices minimise the effects of development on plants, animals and birds.
- Areas that have rare, endangered or vulnerable plants, animals and bird habitats should be protected from development.
- Intensification of land uses and new development sites should not reduce the community's plants, animals and birds.
- Encourage community participation in planning, restoring and protecting the community's natural environment.

3.1.8 Useful Resources

Legislation

Environmental Protection and Biodiversity Conservation Act 1999 (Cth) provides for the protection of the environment, particularly those areas of national significances, promotes the conservation of biodiversity and promotes a co-operative approach to the protection and management of the environment with Torres Strait Islanders.

www.comlaw.gov.au

Nature Conservation Act 1992 (Qld) provides a process to protect significant habitat areas and identify plants, animals and birds, which are rare, threatened or endangered and mechanisms to protect and conserve them.
www.legislation.qld.gov.au

Vegetation Management Act 1999 (Qld) deals with the management and conservation of remnant vegetation.

www.legislation.qld.gov.au

Policies, Guidelines and Fact Sheets

Biodiversity – on our agenda provides an overview of what is biodiversity and why it is important to conserve our plants, animals and birds

www.nrm.gov.au/publications/factsheets

National Strategy for the Conservation of Australia's Biodiversity outlines the processes and systems implemented by the federal government to protect biological diversity and maintain ecological processes.

www.environment.gov.au/biodiversity/publications/strategy

Queensland Biodiversity Policy Framework: sustaining our national wealth outlines the State government's approach to nature conservation, environmental protection and responsible land use planning to secure favourable environmental, economic and social outcomes.

www.derm.qld.gov.au/services_rescources/index.php

Websites

Caring for our Country
www.nrm.gov.au

Department of Environment and Resource Management

www.derm.qld.gov.au

3.2 Coastline

3.2.1 Best Practice

- The natural dynamic processes that shape the coast and beaches are respected.
- Maintain and enhance connectivity between marine and coastal habitat to ensure the healthy function of the coastal zone and marine environments.
- Coastal resources are used sustainably and sensibly.
- The Community's dependence on coastal resources for hunting and fishing is respected and integrated into the planning and management of the coastal zone.
- The ecological and cultural importance of the coastal zone is not compromised by inappropriate development and activities.
- Development within the coastal zone is managed in accordance with the principles of ecologically sustainable development and does not compromise access to the coastal zone.
- Reduce impacts of climate change on the coastline by:
  - recognising the importance of climate change on the coast;
  - avoiding quick decisions now that will make it more difficult to manage climate change risks in the future; and
  - building understanding and capacity of the community to deal with the impacts of climate change on the island's coastline.

3.2.2 Draft Queensland Coastal Plan

The Draft Queensland Coastal Plan was released for comment in late 2009.

Extracts from the Draft policy appear below...

The Draft Queensland Coastal Plan—which includes a Draft State Planning Policy Coastal Protection—makes a significant shift from the previous approach to ensure that coastal protection policies remain effective. The Draft Queensland Coastal Plan addresses planning for future urban development in and near coastal locations and—using the most up-to¬-date projections from climate change science—incorporates actions on the risks that climate change impacts pose to Queenslanders and our coastal resources.

The coastal zone is under significant and ongoing pressure—managing increasing demands to accommodate rapidly growing urban populations, maritime development, recreation and tourism facilities and long-term land management practices in coastal catchments. These demands have accelerated the loss of coastal resources—such as biodiversity—along developed sections of the coast.

Modifications to the coast by various structures have also interfered with coastal processes such as the natural movement of sand and sediment. As a result, sand from beaches has been lost, foreshore vegetation lost, and the capacity of natural systems to adjust to the impacts of likely coastal hazards has been reduced.

The trend to establish development very close to the coast or in low-lying areas is placing many communities at risk from coastal hazards. These hazards include coastal erosion, storm tide inundation and permanent inundation as a result of sea level rise. The impacts of climate change—particularly accelerated sea level rise and cyclone and storm intensity—are increasing the coast's exposure to hazards within a relatively short timeframe.

The Draft Queensland Coastal Plan, which includes the Draft State Planning Policy Coastal Protection, aims to:

- maintain physical coastal processes
- conserve and protect coastal resources
- continue public awareness and appreciation of coastal resources
- retain and enhance public access to the coast
- protect life and property from coastal hazards (such as coastal erosion and storm tide inundation)
- identify opportunities for suitably located maritime development
- ensure ecologically sustainable development of the coastal zone.

The coastal zone encompasses Queensland's coastal waters and islands, ...and the area landward to five kilometres from the coast or to where the land is below 10 metres Australian Height Datum, whichever is further from the coast. The coastal zone extends beyond the foreshore to the coastal plains and hinterland where activities can also have a flow-on effect to the coast if not carefully managed.

Coastal management districts (CMD) are areas requiring particular development controls and management practices. The Department of Environment and Resource Management (DERM) has an assessment role as a concurrence agency, or as the assessment manager, under the Integrated Planning Act 1997 (IPA) within CMDs.

The Draft Queensland Coastal Plan proposes to adopt

- Coastal Zones – including all islands
- Coastal Management Districts - appears to include all islands
- Sea level rise of 0.8m for climate change over the next 100 years
- Defined Storm Tide Event (default is HAT + 2.0m)
- High Hazard Inundation Area (areas with greater than 1m of inundation)
- Low Hazard Inundation Area (areas with less than 1m of inundation)

Some types of development within the Coastal Management Districts would require assessment by the Department of Environment and Resource Management (DERM).

Some types of development within the Coastal Zone and outside of the Coastal management districts would require assessment by the Torres Strait Island Regional Council (TSIRC).

Further details will be available if and when the Draft Queensland Coastal Plan is adopted.

The coastal mapping of the islands has been undertaken to show the extent of the proposed QCP zones although it is only approximate.

Further information is available at:
www.derm.qld.gov.au/coastalplan/index.html

3.2.3 Overview of Current Situation

The coastline is largely undeveloped and is in relatively pristine condition, apart from around the village. The Ugar village is located at the northern end of the island, primarily on the plateau well above the tide influences. At the lower level around the barge ramp there is the freezer, church and general barge unloading area, and the derelict old IBIS store and remains of the IBIS residence. A single existing residential dwelling is located approximately 100 metres to the west of the barge ramp.

The planning and management of the coastal and marine environment of Ugar is shared between the Commonwealth and state governments and their agencies, the TSIRC and Traditional Owners. The Commonwealth government is responsible for waters beyond three nautical miles from low water mark of Ugar coastline.

Inside the three nautical mile limit and for coastal land, the state government exercises control such activities as the licensing of waste disposal, protection of rare and endangered flora and fauna, oil pollution, mineral exploration and exploitation, water quality, marine navigation and provision of boating facilities.

The TSIRC is responsible for land above low tide watermark.

3.2.4 Issues Overview

The primary consideration for the Ugar coastline is the conservation and protection of its coastal environments, which are subjected to urban pressure, increasing weeds and pest infestation, recreational use and the expansion of the village along the coast. The coastal expansion of the village could have a harmful impact on the existing landscape character of Ugar. The protection of the pristine natural environment along Ugar's coastline should be addressed in all planning documents and processes relating to Ugar.

New development or changes to existing structures along the coast must be assessed for the long-term suitability of the site and the vulnerability to natural coastal processes (coastal erosion, storm events and projected sea level rises). When constructing, upgrading or maintaining coastal infrastructure, there must be an increasing focus on the principles of ecologically sustainable development to ensure that the values and the attributes of the coastline are not compromised by inappropriate use and development of the environment.

New development along the shoreline near the barge ramp should be restricted to non-residential uses, such as a shops and service infrastructure. Consideration should be given to designing these in accordance with the Draft Queensland Coastal Plan guidelines.

Development in the area of the southern beach should be discouraged as it is constrained by possible old graves in the area, the presence of nearby water bores and possible tidal storm tide events.

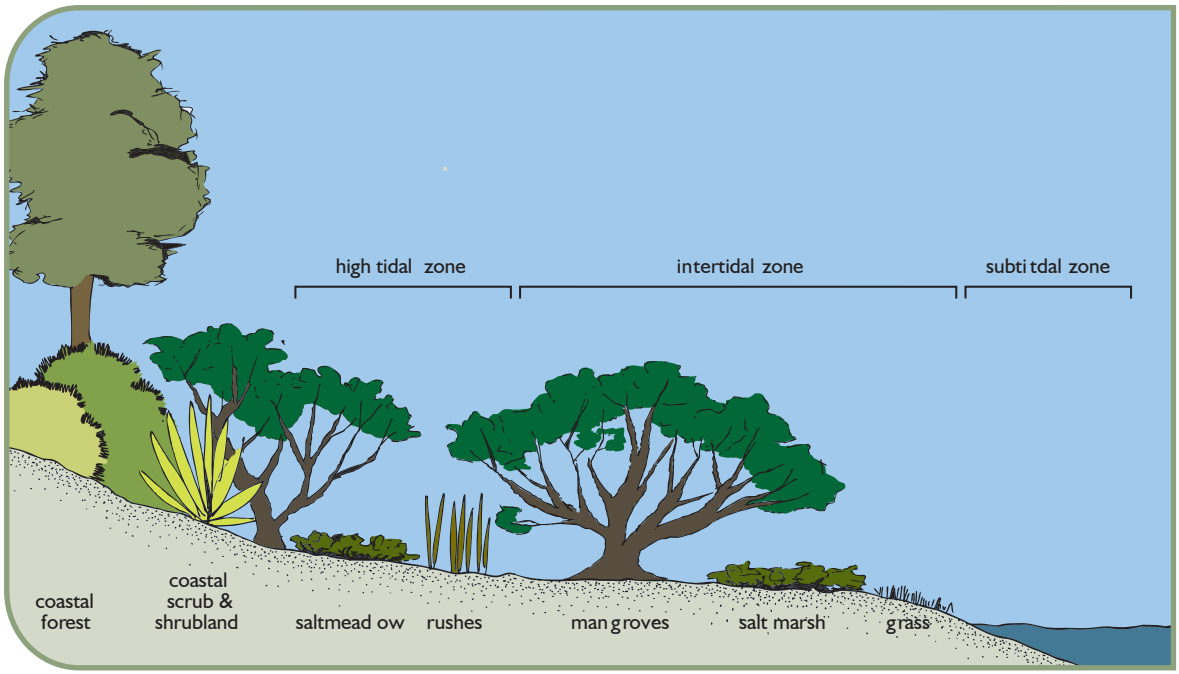
Land use planning can only make good decisions if the best information is available and is understood and supported by the community. The involvement of the community in the decision making process is essential for the successful implementation of any land use strategy.

Figure 2 shows all the different areas of the coastline, which form the 'coastal zone'.

"Beaches are often referred to as the sandy area that separates the sea from the land. However, this area is only part of the beach system which beings in the sand dunes above the high water mark and stretches out to the sea past where the waves break.

In areas where beaches occur, vegetation sand dunes provide coastal protection. Sand dunes absorb the erosive energy of waves generated by cyclones and storms. Dunes also hold reservoirs of sand to replenish the beach during periods of wave erosion. Vegetation on the dunes trap and hold sand blown from the beach aiding dune build up and stopping sand from being blown inland and lost from the active beach and dune system""

Figure 2 The Coastal Zone



3.2.5 Land Use Strategies

To minimise existing and future development on the coastline of Ugar and the impacts of natural hazards, the following strategies are recommended:

- Not permit urban development and infrastructure along the southern, eastern and western coasts of Ugar.
- New development is contained with the village, identified residential expansion areas and the investigation area.
- Any new development is preferably located outside of the water catchment area or can demonstrate that it will not affect the water supply to the bores.
- All development proposals must:
  - include landscaping and/or revegetation plans that are in accordance with the Best Practice, Land Use Strategies and Sustainable Outcomes in Section 3.1 Animals, Plants and Birds;
  - be developed in an ecologically sustainable manner;
  - maintain or improve the values of coastal wetland, estuaries, inlets, riverine corridors, dunes, shorelines, high scenic qualities and retain visual continuity; and
  - address the proposals vulnerability to natural coastal processes (coastal recession, storm events and projected sea level rises);
  - progressively move away from the coast utilising existing vacant lots above HAT 2100; .

3.2.6 Land Use Considerations

In assessing the impacts of future development on Ugar, the following key questions are to be raised. If the answer to any of the questions is 'NO', the proposal must, a) justify the inconsistency, b) be amended, or c) not be accepted.

- Is the development in accordance with the Coastline Best Practice, Land Use Strategies and Sustainable Outcomes?
- Is the development outside of the water catchment area?
- Does the development affect the high vale environmental habitats to the south of the island?
- Is the development in the village? If so, does it
  - complement existing and multiple-use of suitable sites
  - reflect and enhance the coastal character of the village and surrounding areas
  - incorporate ecologically sustainable design
  - maintain or improve the values of the coastline, the high scenic qualities and visual continuity
  - address the proposal's vulnerability to natural coastal processes (coastal recession, storm events and projected sea level rises)
  - address the impact of the proposal on water resources, environmental and social needs, infrastructure and population capacity
  - identify and protect important coastal assets of ecological, visual and cultural significance?

3.2.7 Sustainable Coastline Outcomes

- Protect and maintain the community's coast, including the foreshore, coastal wetlands, dunes, marine ecosystems, coastal marine waters and areas of geological and geomorphological, cultural and historic significance.
- Coordinate the management and use of natural marine resources to enhance community, economic and environmental values.
- Land adjoining coasts and beaches are for community purposes.
- An integrated approach and application of best practice to catchment and coastal management, waterways and wetlands is utilised to provide for environmental flow and the highest quality of water within the community's inland waters, estuaries and the sea.
- Community is involved in the protection and management of the coastline to ensure the protection of their cultural heritage.

3.2.8 Useful Resources

Legislation

Coastal Protection and Management Act 1995 (Qld) provides for the protection, conservation, rehabilitation and management of the coast including resources and biological diversity.
www.legislation.qld.gov.au

Policies, Guidelines and Fact Sheets

Marine Debris Factsheet outlines the cause and potential aims of marine based pollution and debris.
www.amcs.org.au

Marine Pollution Factsheet outlines the causes and potential aims of marine based pollution and debris.
www.amcs.org.au

State Coastal Management Plan: Queensland's coastal policy outlines the State government policies for the protection and management of Queensland coastal resources.
www.derm.qld.gov.au/environmental_management/coast_and_oceans/index.html

Queensland Coastal Plan: Draft 2009: The Draft Queensland Coastal Plan has been developed to help manage and protect Queensland's coastline. The plan gives greater certainty about dealing with coastal hazards such as erosion and sea-level rise and managing the pressures of population and development.
www.derm.qld.gov.au/coastalplan

Websites

Department of Environment and Resource Management
www.derm.qld.gov.au

Australian Maritime Conservation Society
www.amcs.org.au

CoastCare
www.coastcare.com.au

OzCoasts
www.ozcoasts.org.au

3.3 Tides & Storm Surge

3.3.1 Best Practice

- Natural dynamic processes that shape the coastline are respected.
- Reduce community risk, exposure and damage to the adverse impacts of natural hazards such as tides and storm surges by planning coastal use and development to ensure that significant adverse effects of tides and storm surges are avoided, mitigated or remedied.
- The impacts of tide inundation and storm surge are reduced by limiting development along the coast.
- Where development cannot be avoided in areas identified as affected by tides and storm surges, it is to be undertaken in a manner that minimises impacts.
- Reduce the vulnerability of the community to the impacts of climate change by:
  - recognising the importance of climate change on the sea and land environments of the community;
  - avoiding quick decisions now that will make it more difficult to manage climate change risks in the future; and
  - building understanding and capacity of the community to deal with the impacts of climate change on the tide and storm surge levels.

3.3.2 Overview of Current Situation

Due to the geographic location of the Torres Strait as the interface between the Coral Sea and the Arafura Sea, together with the regions shallow bathymetry, tides are extremely complicated varying widely particularly from east to west but can even vary significantly over a few kilometres. The tide range is up to around 5 metres, with the highest tides occurring over the summer months (January - March). This period coincides with the period of greatest likelihood of cyclone occurrence and storm surge adding to the potential for adverse inundation events. Other factors also affect water levels throughout the region including regional wind driven gradients (these slope across Torres Strait and reverse seasonally), water density, as well as the El Niño southern oscillation etc.

The low-lying nature of many islands means the region is particularly vulnerable to tropical cyclones and storms, as well as the potential impacts of climate change. The tropical cyclone and storm impacts on communities are exacerbated by poorly developed coastal infrastructure, inappropriate development along coastlines, lack of scientific research and housing design. Due to the poor and infrequent transport, there is no escape strategy to temporarily relocate Community during extreme events.

At the lower level around the barge ramp there is the freezer, church and general barge unloading area, and the derelict old IBIS store and remains of the IBIS residence. A single existing residential dwelling is located approximately 100 metres to the west of the barge ramp.

The predicted Highest Astronomical Tides appear to peak approximately 0.5m below the top of the barge ramp, but wind and wave effects may make the impact of these tides appear greater. There are no reports of the high tides entering the beautiful church located on the foreshore.

Table 1 shows the Present and Predicted tide levels.

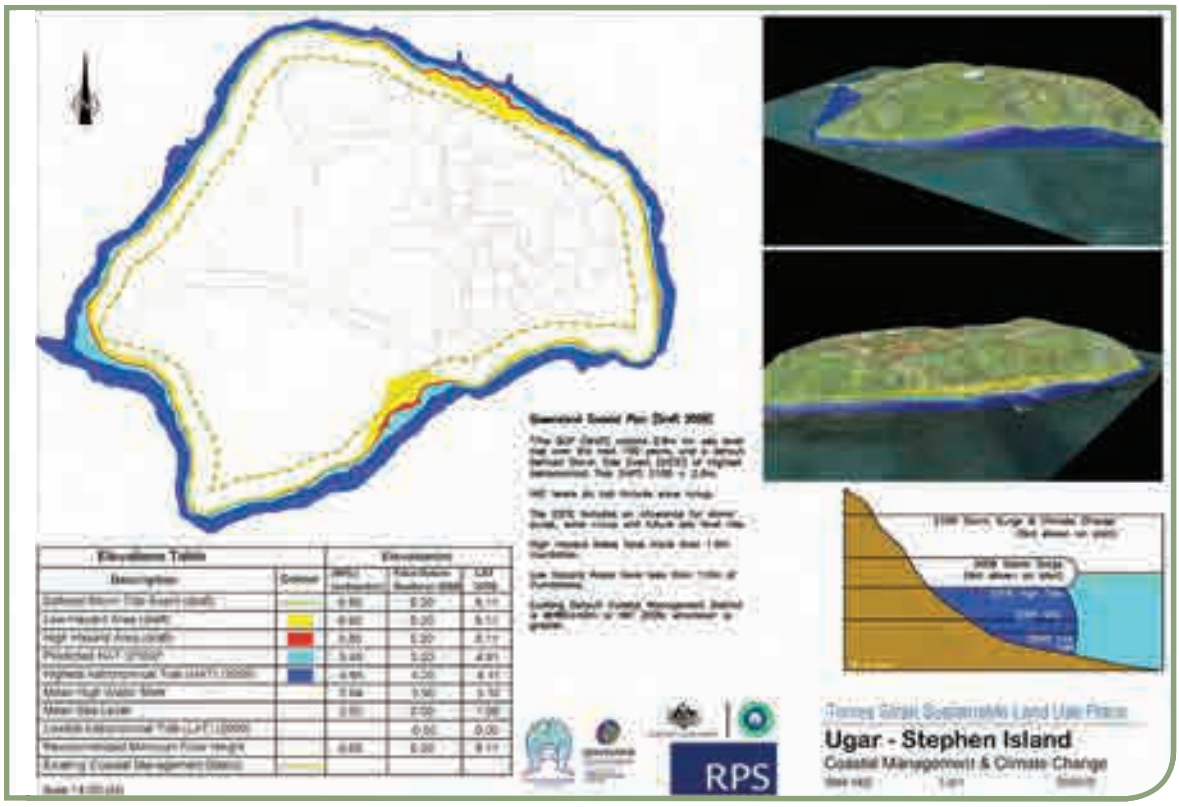
Map 7 shows the impact of coastal inundation and sea level rise.

Table 1 Present and Predicted Tide Levels

Description	Torres Strait Tidal Analysis MSQ2009 - LAT2008	Ausgoid AHD 2008	MSL2008	Schlenker Island Mapping c1998
Defined Storm Tide Event Draft DSTE	6.11	4.39	4.13	6.65
High Hazard Zone	5.11	3.39	3.13	5.65
Highest Astronomical Tide (HAT2100)	4.91	3.19	2.93	5.45
Highest Astronomical Tide (HAT2008)	**4.11**	**2.39**	**2.13**	**4.65**
MHHW	3.10	1.38	1.12	3.64
MLHW	2.36	0.64	0.38	2.90
Mean Sea Level MSL	1.98	0.26	0.00	2.52
MHLW	1.60	-0.13	-0.38	2.14
MLLW	0.86	-0.87	-1.12	1.40
LAT	0.00	-1.72	-1.98	0.54

Source: Torres Strait Tidal Survey MSQ 2009; Schlenker 1998

Map 7 Coastal Management and Climate Change



For more detail, refer to Map No. 9964-1402 contained in Maps.

3.3.3 Issues Overview

The Intergovernmental Panel on Climate Change (2007) has projected sea levels to rise by the end of the twenty first century by up to 0.8 metres. This projection allows for sea level rise due to ice melt and thermal expansion for various greenhouse gas emission scenarios and includes an allowance for accelerated ice melt, relative to 1990. The IPCC note higher rises cannot be ruled out owning to uncertainty about the potential for additional ice melt, with recent scientific papers also suggesting higher levels may be possible. Current consensus also indicates ongoing rise beyond 2100 is likely for many centuries, independent of actions to stabilised greenhouse gases.

Figure 3 shows how storm surges impact on the village.

Figure 4 shows how with rising sea levels, storm surges will further impact on the village.

Figure 3 Storm Surge Area

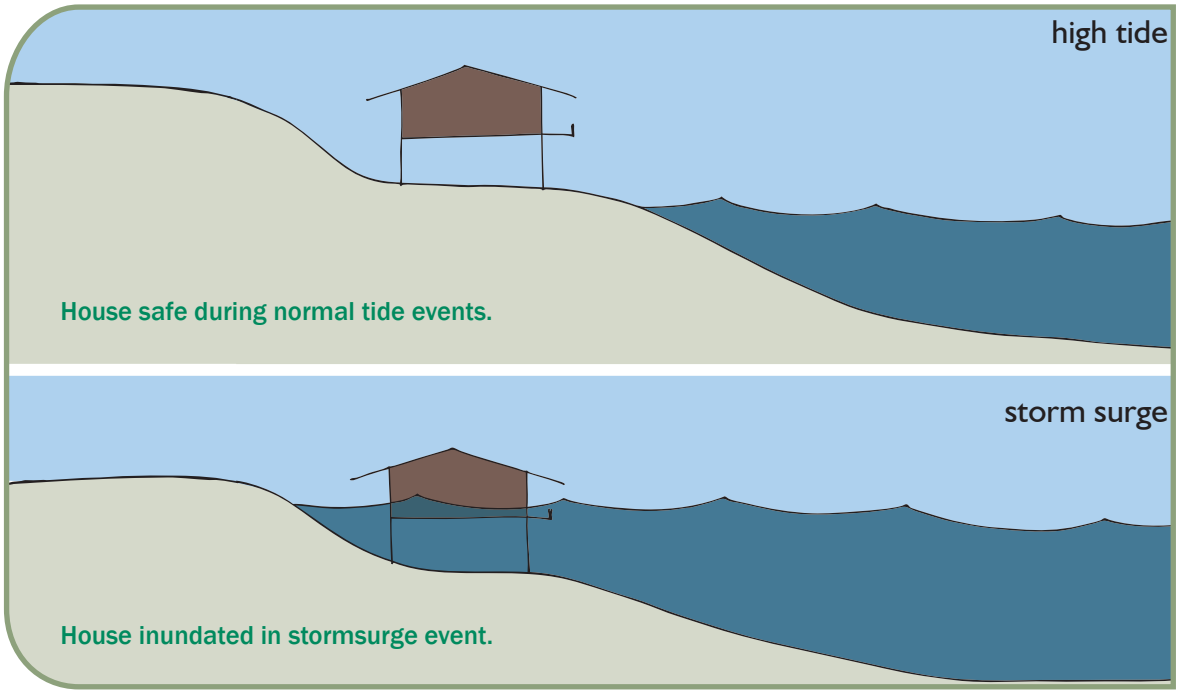
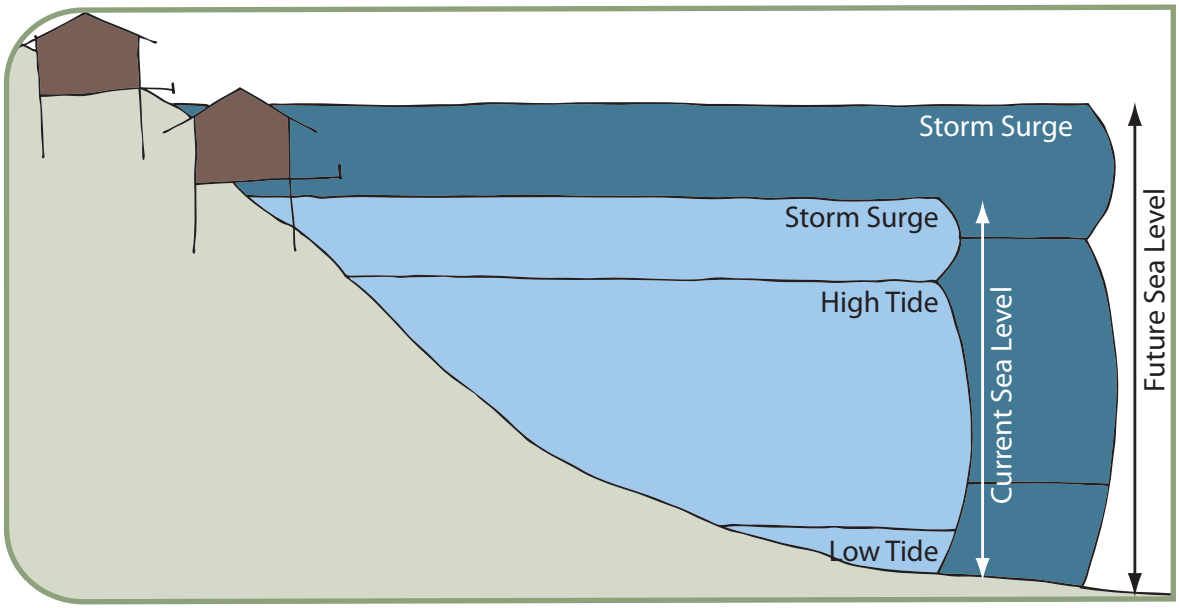


Figure 4 Climate Change and Sea Level Rise



Tidal information is available from the predictions in the Seafarer Tide Charts published by the Australian Hydrographic Service 2009. The current island mapping is based on Lowest Astronomical Tide (LATOriginal).

The Seafarer Tidal Predictions were analysed to see how many times the predicted high tide reached the level of the top of the barge ramp each day. The barge ramp was predicted NOT to be overtopped in 2009.

It should be noted however that the existing data and tidal predictions are known to be of questionable accuracy, thus the exact level of risk to the community is unknown. In addition, no assessment has been undertaken of storm surge, to assess the potential likelihood of inundation above mapped HAT values.

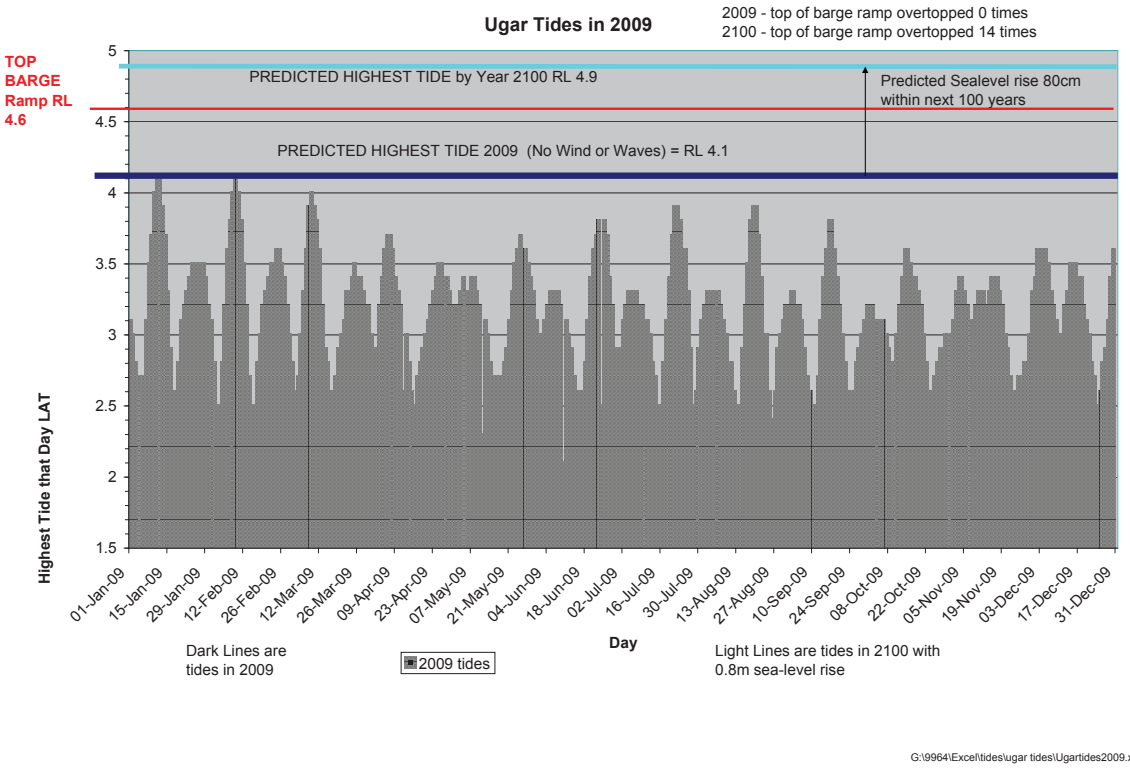
The current adopted amount for sea level rise over the next 100 years of 0.8 metres was then added to each high tide. When allowing for this sea level rise the predictions extrapolate to the top of the barge ramp being overtopped by up to 0.3m for 14 days a year by the year 2100.

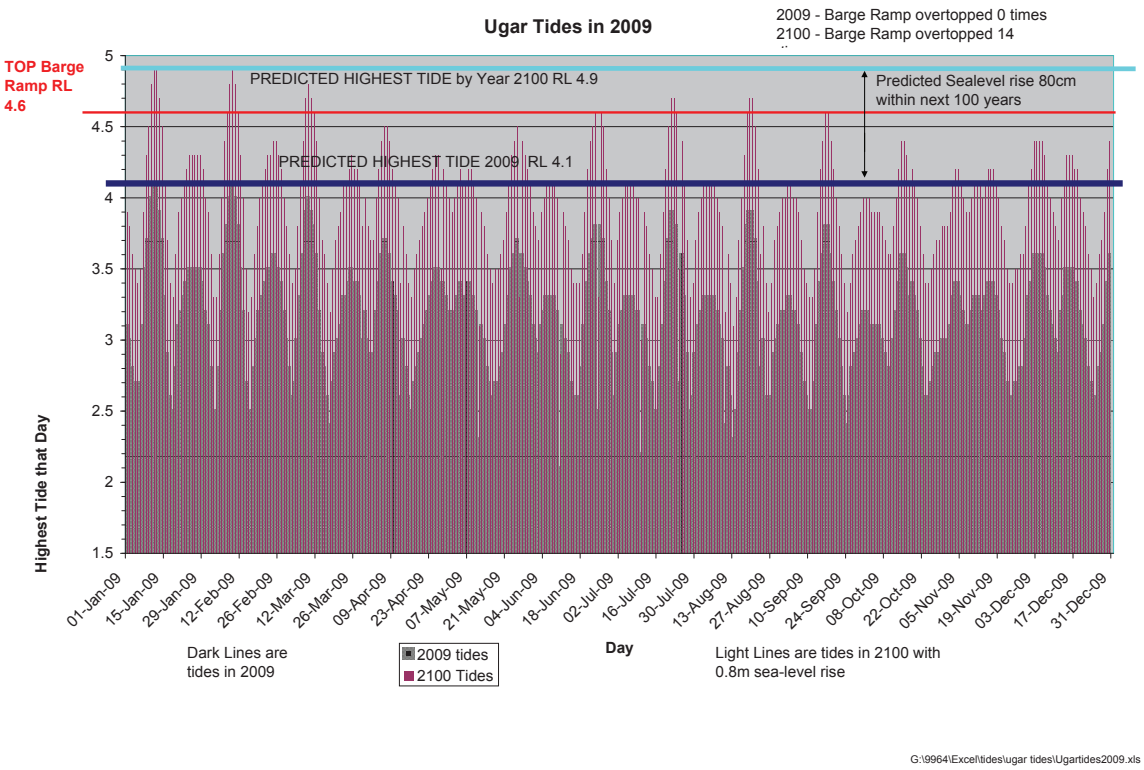
The sea level rise relates to a global worldwide average sea level rise and has been used, as there are no actual sea level predictions specifically for the Torres Strait. For this reason, this Plan has adopted a possible increase in sea level of 0.8 metres by 2100.

The adopted 0.8 metres should be revised at regular intervals to consider the current scientific consensus on sea level rise, as the impacts of sea level rising has a dramatic effect on Torres Strait communities. This is particularly important for the design and construction of infrastructure on the islands (such as sea walls, house slabs and desalination plants).

Figure 5 shows the present and predicted high tide occurrences.

Figure 5 Present and Predicted High Tide Occurrences





For this reason, the designs for new houses or modifications to existing houses should incorporate mitigation measures that include a 'refuge area' designed to withstand possible storm surge and tidal inundation in extreme events. This can be easily incorporated into existing designs by amending the walls of the existing ground floor toilet area from weatherboards to reinforced masonry/concrete walls that extend from the concrete slab to the upper ceiling of the first floor. These areas can contain toilet or laundry facilities downstairs and bathroom/toilet areas on the first floor. Ideally, access stairs should be located next to this core 'refuge' area.

As all the housing on Ugar is situated well above the proposed tide levels these requirements will not be applicable to the majority of existing or proposed dwellings.

Ugar coastal ecosystems and fringe landforms — among them, coastal flood plains, forests, dunes, berms serve as natural shock absorbers for protecting coastal infrastructure and land uses against tropical storms; they also provide critical storage capacities for storm surges and floodwaters. When the functioning of these coastal and fringe systems is threatened and damaged Ugar's coastal and urban areas are vulnerable. This is occurring along the south-eastern coast of Ugar which is a high erosion prone area. Action needs to be taken to conserve and enhance the ecological and human resilience to the sea level rise and storm surges through effective land use planning. However, there are no land-use planning and design guidelines in the Torres Strait to provide incentives for developers and their architects to recognise or accommodate vulnerability to climate variability and change.

For Ugar this includes a combination of strategies that are addressed in the next section.

The Coastal Planning for Adaptation to Global Climate Change identified physical impacts that include:

- submergence of low-lying wetland and dry land areas;
- erosion of soft shores by increasing offshore loss of sediment (e.g. beaches);
- increased salinity of estuaries and aquifers;

- rising coastal water tables; and
- increased and more severe coastal flooding and storm damage.

The Ugar community has indicated a wish to continue living on the island. They are aware that:

- some of the island is low lying, and flooding events may become more regular and more significant in the future due to climate change; and
- flooding will only happen occasionally, on the highest tides and when weather conditions are unfavourable, at least for the near future.

The people of Ugar are prepared to participate in a process of adapting to environmental and climate change that may include:

- not rebuilding in the same place if that place is subjected to erosion or inundation;
- not building new infrastructure in hazardous locations unless absolutely essential;
- allowing some parts of the island to erode, where that erosion is not causing harm to people, infrastructure or important cultural sites, while monitoring the situation.

The community recognises that mitigation and adaptation will raise issues that must be addressed within Community, such as land ownership and traditional rights. The community has indicated a willingness to work through these issues.

3.3.4 Land Use Strategies

The first strategy is to encourage the community to move from the low-lying coastal floodplains and high hazard areas to land beyond a 40-metre setback from the top of the beach, as stipulated by state government coastal planning requirements. Over time, land within the setback area would be used for general community purposes. This strategy would result in a buffer between the shoreline and the village, to minimise the impacts of tide inundation and storm surge to development and infrastructure beyond the 40-metre setback.

New development should consider the Draft Queensland Coastal Plan requirements for low hazard and high hazard areas.

On Ugar, the following strategies should be considered; in the low or high hazard Defined Storm Tide Areas:

- New Development is to be implemented in accordance with Draft Queensland Coastal Plan requirements.
- Discouraging:
  - temporary buildings such as converted sheds;
  - structures used for the manufacture or storage of hazardous materials;
  - community infrastructure development such as shops or halls unless design in accordance with the Draft Queensland Coastal Plan requirements;
  - an intensification of uses or works that are likely to increase the adverse impacts of tides and storm surges.
- Encouraging development to consider the physical coastal processes, in particular seeking to minimise:
  - erosion of adjacent coastal areas;
  - interference with the flow of water;
  - alteration of existing water flows; and
  - damage to existing coastal vegetation.
- The management and reduction of greenhouse gas emissions through improved community awareness, knowledge and behavioural changes.
- New house design and modifications to existing houses should incorporate mitigation measures, including:
  - provision of a 'refuge area' which is built on a concrete slab and includes reinforced masonry/concrete walls from the ground to the upper ceiling;
  - a 'strong area' that is generally a bathroom/toilet or laundry/toilet;
  - an upper floor living area;
  - habitable floor levels of a minimum 6.65 metres Schlenker (which is equivalent to the current HAT2008 plus 2.0m for storm surge).
  - Note that the ground level at the church and the old IBIS store is approximately 6.0 metres
  - Or alternatively: New house design is to adopt 100 year ARI level from inundation study when finalised(or where possible a the equivalent allowance in 2100)
- Mechanical and electrical works (e.g. pump stations)
  - are to be above predicted 2100 HAT, plus 2m storm surge;
  - (Or alternatively: about 500 year ARI level from inundation study when finalised (or where possible a the equivalent allowance in 2100)
- Regular review of sea levels to take into account the most current predictions.
- Sea level monitoring to improve accuracy of data, tidal predictions, knowledge of storm surge and sea level rise.
- Immediate development of emergency response plans for storm surge and cyclone occurrence to manage risk to life and property.

3.3.5 Land Use Considerations

In assessing the impacts of future development on Ugar, the following key questions are to be raised. If the answer to any of the questions is 'NO', the proposal must, a) justify the inconsistency, b) be amended, or c) not be accepted.

- Is the development in accordance with the Tides and Storm Surge Best Practice, Land Use Strategies and Sustainable Outcomes?
- Is the development consistent with local and regional climate change response strategies?
- Where the development is proposed in an area identified as affected by tides and storm surges, is it:
  - -accompanied by a detailed hydraulic study;
  - designed to resist water forces as a result of inundation;
  - designed to incorporate any recent sea level rise research that changes the current predicted sea level rise of 0.80 metres; and
  - designed to prevent the intrusion of floodwaters as a result of inundation?
- Does the development affect counter disaster operations?
- Does the development comply with Draft Queensland Coastal Plan requirements?
- Are all habitable floors above RL6.65m Schlenker?

3.3.6 Land Use Projects

To protect the environments on Ugar, a regular review of scientific data on predicted sea level rises is required. It is recommended that an investigation into the predicted sea level rise due to climate change should be undertaken specifically for the Torres Strait region. This investigation would provide information that is more relevant rather than the current adopted global value of 0.8 metres.

3.3.7 Sustainable Outcomes for Areas affected by Tides and Storm Surge

- Coastal use and development is planned and managed to ensure that significant adverse effects of tidal inundation and storm surges on the natural and man made environments are avoided, mitigated or remedied.
- Development and use of the coast is to maintain and, where possible, enhance the quality of life for residents and visitors by avoiding areas identified as being adversely affected by tidal inundation and storm surges.
- Community determine the level of storm tide risk they are willing to accept.

3.3.8 Useful Resources

Legislation

Coastal Protection and Management Act 1995 (Qld) provides for the protection, conservation, rehabilitation and management of the coast including resources and biological diversity.
www.legislation.qld.gov.au

Policies, Guidelines and Fact Sheets

Mitigating the Adverse Impacts of Storm Tide Inundation provides advice and information on the interpretation and implementation of the Coastal Hazard Policy of the State Coastal Management Policy.
www.derm.qld.gov.au/register/p01698aa.pdf

2006 King Tides in the Torres Strait Factsheet gives an overview of king tides in the Torres Strait 2006 and how the (Environmental Protection Agency) EPA uses this information is king tide predictions for the rest of the state.
www.derm.qld.gov.au/register/p01864aa.pdf

Queensland Storm Tide Information Resource Factsheet provides an overview of the Queensland Storm Tide Information Resource, which seeks to compile and consolidate all available storm tide information in Queensland into a single, stand-alone and portable resource.
www.derm.qld.gov.au/register/p02295aa.pdf

Preparation of a Shoreline Erosion Management Plan Guideline provide advice to local governments in preparation a Shoreline Erosion Management Plan to proactively plan for erosion management in erosion hotspot areas.
www.derm.qld.gov.au/environmental_management/coast_and_oceans/index.html

Websites

Department of Environment and Resource Management
www.derm.qld.gov.au

National Tidal Centre
www.bom.gov.au

OzCoasts
www.ozcoasts.org.au

3.4 Waterways and Wetlands

3.4.1 Best Practice

- Natural waterways, wetlands, catchments and associated natural dynamic processes that shape them are respected, managed to protect the ecological processes, enhance the water quality, conserve riparian ecological values and landscape quality, while acknowledging nature based recreation opportunities.
- The quality of all water sources are protected and wherever possible, enhanced.
- The ecological and cultural importance of waterways and wetlands and their sources are not compromised by inappropriate development and activities.
- Maintain and enhance riparian corridors and buffers to ensure the healthy function of the riparian zone of waterways and wetlands.
- Reduce the vulnerability of the community to the impacts of climate change by:
  - recognising the importance of climate change on the waterways and wetlands environments of the community;
  - avoiding quick decisions now that will make it more difficult to manage climate change risks in the future; and
  - building understanding and capacity of the community to deal with the impacts of climate change on the community's waterways and wetlands.

"A waterway can be a creek, brook, river or stream and include a lake, estuary or inlet at its base. Waterways also include floodplains and wetland systems that overflow into rivers, as well as any lakes or swamps that are filled by streams rather than shallow groundwater"

3.4.2 Overview of Current Situation

On Ugar, there are no discernible watercourses evident. The man water catchment drains to the south and converts into a track that runs to one dwelling located on the beach.

Map 6 shows the identified significant watercourses and habitats.

3.4.3 Issues Overview

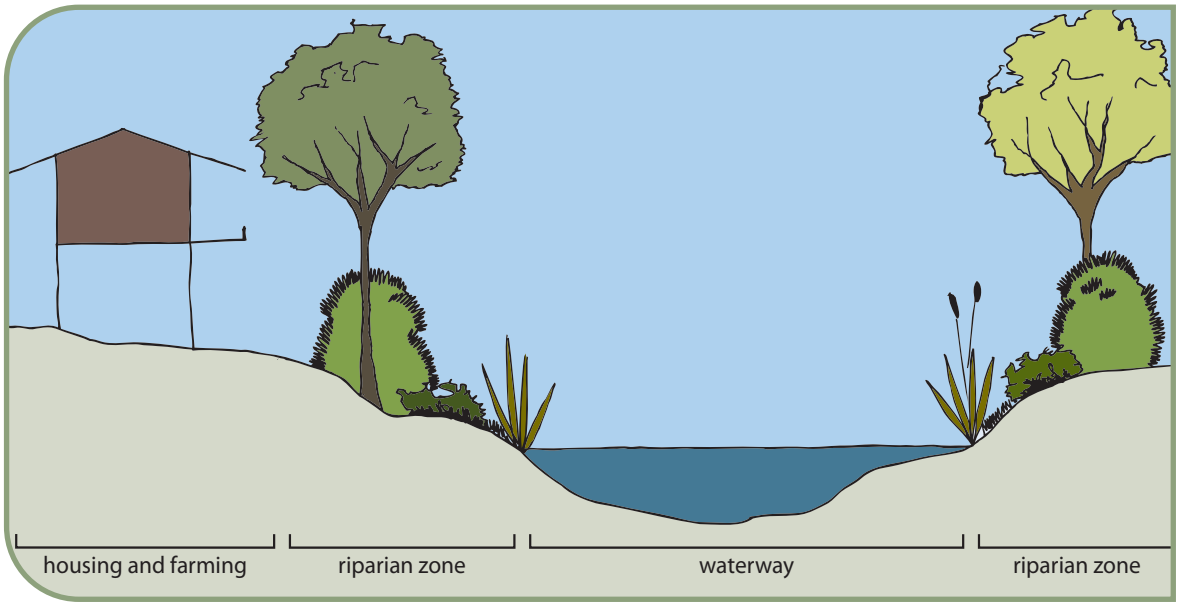
Waterways, associated floodplains and riparian areas support a range of natural and economic functions, including habitat for land and sea wildlife, nursery grounds for creek and bay fisheries, potable water supplies, stormwater conveyance, provision of sand for building materials, ecological linkages, scenic amenity and recreational opportunities.

A lack of a continuous water supply and the inefficient water use are a problem on Ugar due to the transient nature of the waterways. Any new development or intensification of existing land uses on Ugar should not utilise groundwater resources. The impact of Ugar's water problem is discussed in 6.1 'Water' of the Plan.

Figure 6 shows how if buffer areas are left between waterways and wetlands, it provides protection to the waterways and wetlands from the impacts of development.

"Wetlands are predominately areas that are permanently, seasonally or intermittently waterlogged or inundated with water that may be fresh, saline, flowing or static. Seasonal wetlands, particularly seasonal waterlogged wetlands, often have a higher plant and animal species richness that permanent wetlands"

Figure 6 Waterway and Wetland Buffer



3.4.4 Land Use Strategies

To minimise existing and future development impacts on Ugar's waterways and wetlands the following strategies are recommended:

- All development proposals must:
  - include landscaping and/or revegetation plans that are in accordance with the Best Practice, Land Use Strategies and Sustainable Outcomes of '3.1 Animals, Plants and Birds'.
  - be ecologically sustainable development;
  - maintain or improve the values of coastal estuaries, inlets, dunes, shorelines, high scenic qualities and retain visual continuity;
  - address the proposals vulnerability to natural coastal processes (coastal recession, storm events and projected sea level rises); and
  - where adjacent to a degraded riparian corridor, include rehabilitation plans for the corridor.
- Development controls based on the assessed risk for developments near waters include controls on minimum elevations, setbacks and lot sizes, as well as maximum densities and site coverage.
- Development is not encouraged:
  - at the head waters of waterways and wetlands;
  - where it has detrimental impact on natural flow regimes and quality water systems;
  - in areas within 40 metres of waterways to provide a buffer between riparian areas and development; and
  - to utilise groundwater resources.

A catchment area or basin is land which is bounded by natural features such as hills or mountains from which all runoff water flows to a low point. This low point will be a dam, a location in a river or the mouth of a river where the water enters the ocean."

3.4.5 Land Use Considerations

In assessing the impacts of future development on Ugar, the following key questions are to be raised. If the answer to any of the questions is 'NO', the proposal must, a) justify the inconsistency, b) be amended, or c) not be accepted.

- Is the development in accordance with the Waterways and Wetlands Best Practice, Land Use Strategies and Sustainable Outcomes?
- Does the development:
  - protect water supply catchments and significant underground waterways;
  - retain vegetation cover to assist in maintaining an enhancing water quality;
  - maintain the absorptive capacity of soils;
  - maintain existing waterways and wetlands as a means of absorbing peak flows from floods or the effects of cyclones and storm surge; and
  - implement management practices during and after development to protect waterways?

3.4.6 Sustainable Waterways and Wetland Outcomes

- Protect and where possible, restore catchments, waterways, water bodies, groundwater, water quality and dependent ecosystems such as marine environments while maintaining the economic and social values derived from water use.
- Development should not diminish the quality or quantity of water in groundwater systems, watercourses, nor should it diminish the volume of water flows in watercourses or wetlands.
- Water on the community is managed in a sustainable and integrated manner to provide adequate supplies for human and environmental uses.

3.4.7 Useful Resources

Policies, Guidelines and Fact Sheets

Catchment and Water Quality provides an overview of the link between the health of a water catchment and water quality.
www.derm.qld.gov.au/factsheets/pdf/catchments/c2.pdf

Gully Erosion gives an overview of what is gully erosion and what we can do to minimise its impacts.
www.derm.qld.gov.au/factsheets/pdf/land/l81.pdf

How Healthy is your Waterway? Assessing stream bank vegetation describes how to find out if your waterways are healthy by ensuring a well vegetated riparian zone in order to minimise the impacts of erosion on water quality
www.derm.qld.gov.au/factsheets/pdf/river/r34.pdf

Overland Flow Water provides an overview of what is overland flow water and why it is important to manage overland flow.
www.derm.qld.gov.au/water/management/overland_flow/index.html

Strategic Plan for the Conservation and Management of Queensland's Wetlands sets out the state government's intent for the conservation, values and functions of wetlands.
www.derm.qld.gov.au/wetlandinfo/site/PPL/QldWetlandProgramme.html

Streambank Planting Guidelines and Hints describes what type of vegetation you should plant in riparian zones and where to plant it.
www.derm.qld.gov.au/factsheets/pdf/river/r31.pdf

Streambank Vegetation is Valuable provides an overview of why we need vegetation riparian zones along our watercourses.
www.derm.qld.gov.au/factsheets/pdf/river/r30.pdf

The Value of Wetlands talks about the role of wetlands in nature conservation.
www.wetlandcare.com.au/fact_sheets.asp

What, Why and How Wetlands Works provides an introduction to the important role that wetlands play and why we should protect them.
www.wetlandcare.com.au/fact_sheets.asp

What is Bank Erosion talks about what is bank erosion and how it is caused.
www.derm.qld.gov.au/factsheets/pdf/river/r2.pdf

Websites

Department of Environment and Resource Management
www.derm.qld.gov.au

WetlandCare Australia
www.wetlandcare.com.au

3.5 Land and Soil

3.5.1 Best Practice

- Minimise the impact of salinity and rising water tables on land uses, buildings and infrastructure by minimising land and soil disturbance.
- The management of the land and soil will be designed to work with nature rather than against nature and integrated with sea planning and management to ensure the negative impacts of human actions (e.g. development, vegetation clearing) on plants, animals and birds is minimised or avoided.
- Reduce the vulnerability of the community to the impacts of climate change by:
  - recognising the importance of climate change on the community's land, soil and slopes;
  - avoiding quick decisions now that will make it more difficult to manage climate change risks in the future; and
  - building understanding and capacity of the community to deal with the impacts of climate change on the community's land, soils and slopes.

3.5.2 Overview of Current Situation

The Island consists mainly of central plateau elevated 20 to 30m above sea level with escarpments on all sides falling away steeply to narrow beaches on the north and south. The Island also falls away more gradually towards the west to a third beach.

The "Torres Strait Water Supply Stage 2 Geotechnical Information GHD 1999" describes Ugar as an island that "... consists of olivine basalt lavas and tuffs of the Maer Volcanics. The tuffs reportedly contain coral fragments and extinct volcanic cones..."

The central plateau shows a weathered mantle of red clay to depths greater then 10m.

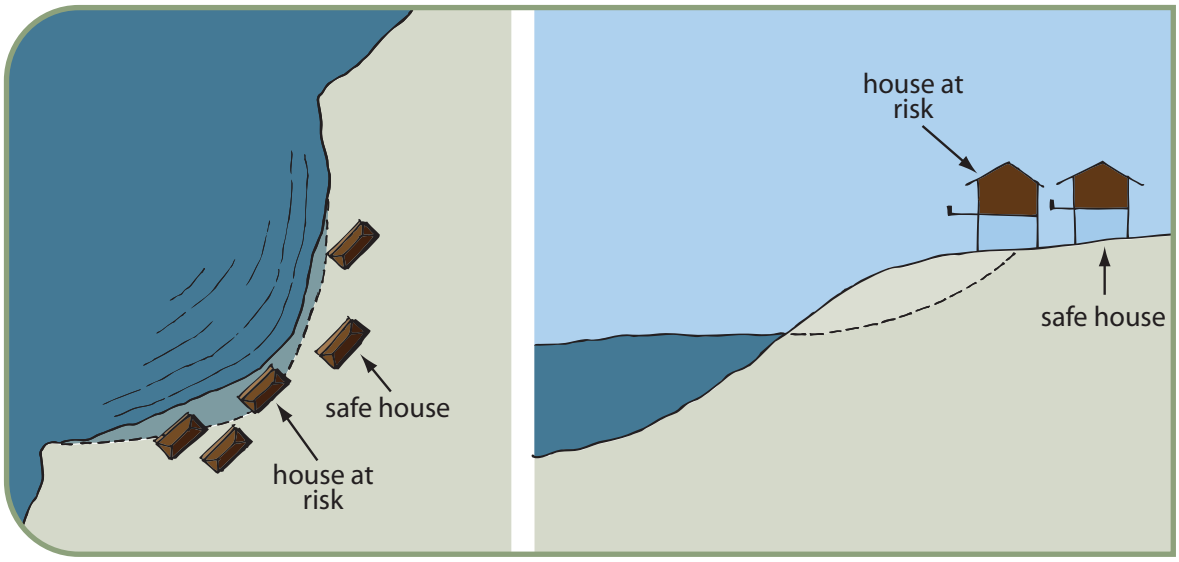
There are no defined rivers or streams channels evident on the Island.

The extensive vegetation cover over parts of Ugar has meant that land erosion is not a major issue. The rich red soil supports dense vegetation where it has not been cleared. However, if the vegetation is cleared for development or garden plots, then the potential for land erosion to occur will increase significantly.

A significant amount of the Islands tropical vegetation (approximately 60m wide by 400 m long) was cleared in 1986 supposedly for a future airstrip. However the orientation of this clearing was not suited for the construction of an airstrip as it was at approximately 45 degrees east of north, such that the airstrip would at most times be subject to direct cross winds from the prevailing north west and south east winds.

Figure 7 shows where the 'coastal erosion zone' can occur when there is no seawall.

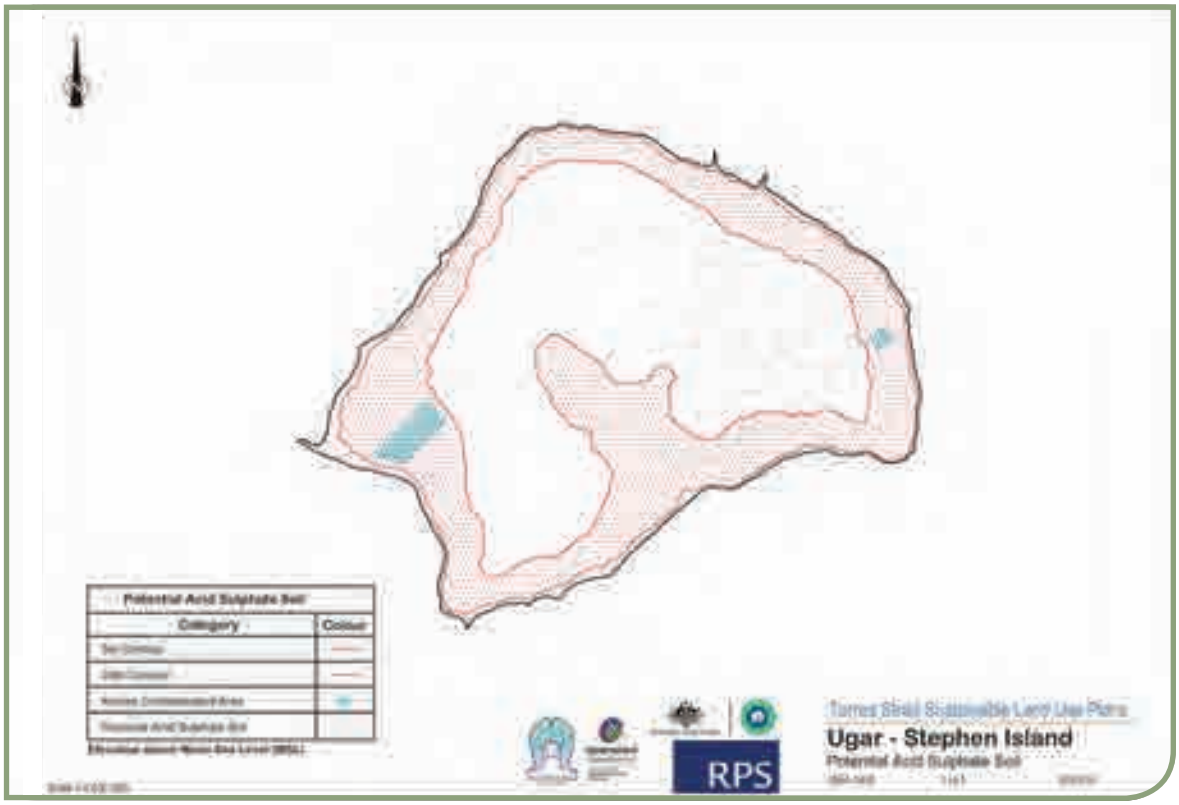
Figure 7 Coastal Erosion



There is a lack of data available on soil types on Ugar, In coastal areas below 5metres AHD there is the potential for acid sulfate soils to be present. Exposed acid sulfate soils can result in environmental as fish kills, and can corrode building foundations and infrastructure such as water and sewer pipes.

Map 8 shows the potential location of acid sulfate soils.

Map 8 Potential Acid Sulfate Soils



For more detail, refer to Map No. 9964-1408 contained in Maps.

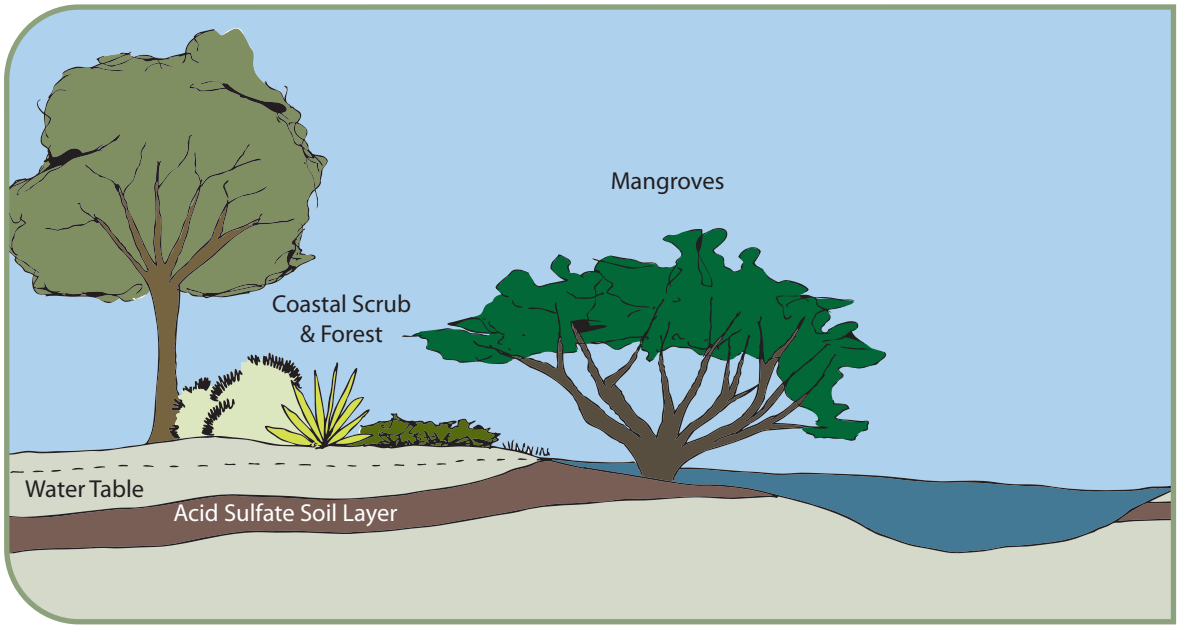
"Acid sulfate soils are naturally occurring soils and sediment containing iron sulfides, most commonly pyrite.
When acid sulfate soils are exposed to air, the iron sulfides in the soil react with oxygen and water to produce a variety of iron compounds and sulphuric acid. Initially a chemical reaction, the process is accelerated by soil bacteria. The resulting acid sulfate soils can release other substances, including heavy metals, from the soil and into the surrounding environment."

"Acid sulfate soils can result in the corrosion of concrete, steel and some aluminium alloys used in buildings, drainage systems and roads. The use of acid sulfate soil material as site fill material or in embankments can affect plant growth and block pope drainage systems due to the formation of iron oxides. Acid waters entering estuarine, coastal or riverine environments can kill fish and crustaceans and affect aquatic plants through direct acid exposure.

The presence of acid sulfate soil material produces an offensive odour, which smells like rotten eggs"

Figure 8 shows where acid sulfate soils are located within the soil layers.

Figure 8 Acid Sulfate Soils



3.5.3 Issues Overview

Ugar's landform, existing vegetation cover and a lack of any significant waterway means there are limited issues in relation to Land and soil.

However, any expansion is limited by the steep escarpments around Ugar and the need to retain and preserve natural habitat areas in the southern areas of the site.

Land erosion usually occurs where vegetation has been cleared. Whilst this has not been a significant issue on Ugar, any future clearing of vegetation will likely result in significantly increased land erosion problems. Furthermore, climate change related to global warming may result in rising sea levels and/or an increase in the frequency of major coastal storms, both of which might accelerate erosion on coastal areas. New development near vegetated areas may result in the potential for land erosion and subsequent runoff and needs to be effectively managed or where possible, avoided.

Fortunately, Ugar's developed areas are largely situated on inland areas of the island, and a substantial buffer exists between most developed areas and the coast. Thus natural coastal variations are unlikely to pose a major threat to human life and property in the foreseeable future.

3.5.4 Land Use Strategies

To minimise existing and future development on Ugar land and soil, the following strategies are recommended:

- All development should include landscaping and/or revegetation plans that are in accordance with the Best Practice, Land Use Strategies and Sustainable Outcomes of Section 3.5 Land and Soil.
- Not encourage any new development along the coast particularly in those areas adjacent to the areas identified as 'high erosion prone'.
- Adequate services and access must be provided where development is located on steep slopes.
- Development proposed in areas at or below 5 metres AHD, an acid sulfate soil investigation is to be undertaken and where necessary, an environmental management plan is prepared.
- Highly erodible or unstable soils are to be left in their natural condition to prevent erosion, sedimentation and water quality degradation problems.
- During construction of a development, soil erosion and sedimentation control measures must be in place prior to and during construction and maintenance.

3.5.5 Land Use Considerations

In assessing the impacts of future development on Ugar, the following key questions are to be raised. If the answer to any of the questions is 'NO', the proposal must, a) justify the inconsistency, b) be amended, or c) not be accepted.

- Is the development in accordance with the Land and Soil Best Practice, Land Use Strategies and Sustainable Outcomes?
- If the development is adjacent to the areas identified as 'high erosion prone', does it address its impact on the identified area?
- Where development occurs on land below 5 metres AHD are the acid sulfate soils disturbed when excavating or otherwise removing soil or sediment, extracting groundwater or filling land? If so, is the development proposal accompanied by a report on an:
  - acid sulfate soil investigation;
  - environmental management plan; and
  - ongoing management program for treating disturbed acid sulfate soils and drainage waters?

3.5.6 Sustainable Land and Soils Outcomes

- Development and use of the coast is to maintain and, where possible, enhance the quality of life for residents and visitors by avoiding areas identified as being adversely affected by acid sulphate soils, steep slopes, erosion and landslides.
- Drainage activities should avoid or minimise land degradation, including soil erosion, compaction, land instability, contamination, acidity, water logging, decline of native vegetation or, where appropriate, salinity and, where possible, land should be rehabilitated.
- Development involving acid sulfate soils should be planned and managed to avoid potential adverse effects on the natural and built environment (including infrastructure) and human health.

3.5.7 Useful Resources

Legislation

Coastal Protection and Management Act 1995 (Qld) provides for the protection, conservation, rehabilitation and management of the coast including resources and biological diversity.
www.legislation.qld.gov.au

Policies, Guidelines and Fact Sheets

State Planning Policy 1/03 – Mitigating the Adverse Impacts of Flood, Bushfire and Landslide sets out the state government's interest in ensuring the natural hazards of flood, bushfire and landslide are adequately considered when making decisions about development.
www.dip.qld.gov.au/policies/index.php

State Planning Policy 2/02 – Planning and Managing Development Involving Acid Sulfate Soils sets out the state interest concerning development involving acid sulphate soils in coastal areas.
www.dip.qld.gov.au/policies/index.php

What is Bank Erosion talks about what is bank erosion and how it is caused.
www.derm.qld.gov.au/factsheets/pdf/river/r2.pdf

Gully Erosion gives an overview of what is gully erosion and what we can do to minimise its impacts.
www.derm.qld.gov.au/factsheets/pdf/land/l81.pdf

Acid Sulfate Soils in Queensland explains what acid sulfate soils are, how they are formed, where they occur and what happens when they are disturbed.
www.derm.qld.gov.au/land/ass/index.html

Identifying Acid Sulfate Soils describes the scientific process for identifying is acid sulfate soils are in the soil.
www.derm.qld.gov.au/land/ass/identifying_ass.html

Managing Acid Sulfate Soils provides an overview of the techniques that can be used to manage acid sulfate soils if they are disturbed.
www.derm.qld.gov.au/factsheets/pdf/land/l62.pdf

Coastal Erosions introduces what is coastal erosion and what are the causes of coastal erosion.
www.bom.gov.au/pacificsealevel

Websites

Department of Environment and Resource Management
www.derm.qld.gov.au

OzCoasts
www.ozcoasts.org.au

3.6 Bushfire

3.6.1 Best Practice

- The management of areas prone to bushfire is to work with nature rather than against nature.
- The location and design of development is undertaken in a manner that:
  - does not alter natural fire regimes;
  - significantly increase the risk to human life, property and infrastructure from bush fire; and
  - minimises the potential risk to the safety and health of the community as a result of bushfire.
- Reduce the vulnerability of the community to the impacts of climate change by:
  - recognising the importance of climate change on the community's bushfire environment;
  - avoiding quick decisions now that will make it more difficult to manage climate change risks in the future; and
  - building understanding and capacity of the community to deal with the impacts of climate change the community's bushfire environment.

3.6.2 Overview of Current Situation

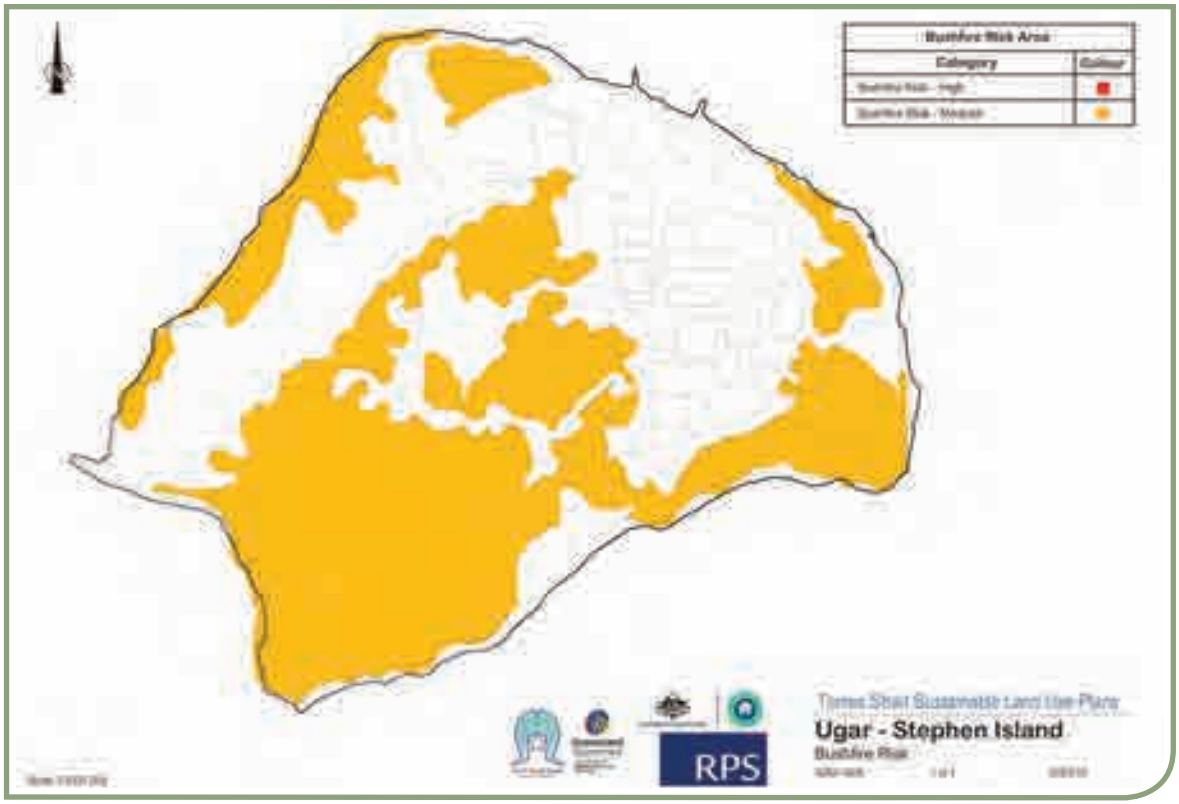
The areas of natural vegetation are subject to bushfire and the presence of human activity increases the likelihood and potential frequency of fire, which can significantly alter the ecological characteristics of Ugar. Inappropriate burning of the native forests could cause the margins of this vegetation type to contract, effectively reducing its area and function as habitat.

Using the State Planning Policy 1/03 "Mitigating the Adverse Impacts of Flood, Bushfire and Landslide" methodology, areas of Ugar are identified as medium bushfire risk. Importantly, most of the village area is not identified by this mapping as a significant bushfire risk.

Note that this is not the predicted extent of the predicted hazard, but an area within which the hazard needs to be considered. The areas identified on the maps may not necessarily be the full extent of the hazard.

Map 9 shows the location of bushfire hazard areas.

Map 9 Bushfire Risk



For more detail, refer to Map No. 9964-1409 contained in Maps.

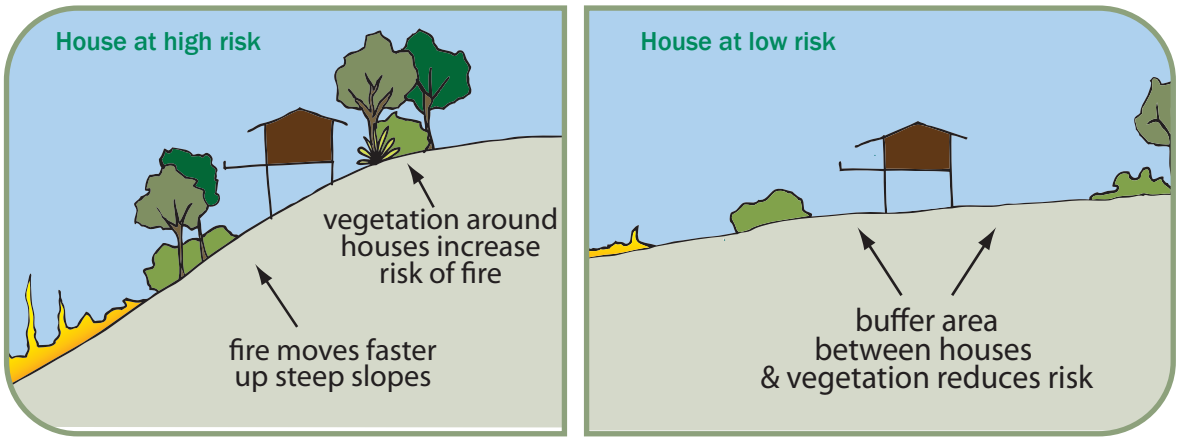
3.6.3 Issues Overview

Bushfires represent an ever-present risk to life, property and the environment. While the obvious answer would be to avoid development near bushfire hazards or to prevent bushfires from occurring, neither are realistic options due to the growing demands for residential land and the growing understanding of the ecological processes dependent upon bushfire.

One of the ways of managing risks to life, land, property and the environment from bushfire is through appropriate land use planning strategies. Identifying bushfire prone areas across Ugar will inform future generations and guide where development should or should not occur at the beginning of the planning process.

Figure 9 shows how providing a firebreak between dwellings and bushfire hazard areas assists in reducing the threat of bushfire.

Figure 9 Bushfire Risk



3.6.4 Land Use Strategies

To minimise the impacts of bushfire on existing and future development, the following strategies are recommended:

- Development is not permitted in areas of medium bushfire risk otherwise; development must be compatible with the natural hazard where there is no other site suitable and reasonably available.
- New development must have access to and is accessible by sealed roads or high quality unsealed roads to facilitate emergency vehicle access.
- All development adjacent to or within an identified bushfire risk area must:
  - have setbacks as a firebreak which is maintained on an ongoing basis;
  - have access to adequate water supply;
  - not increase bushfire hazard or public safety risk;
  - maintain the health, safety and wellbeing of the community; and
  - minimise the impacts from bushfire on existing development.

3.6.5 Land Use Considerations

In assessing the impacts of future development on Ugar, the following key questions are to be raised. If the answer to any of the questions is 'NO', the proposal must, a) justify the inconsistency, b) be amended, or c) not be accepted.

- Is the development in accordance with the Bushfire Best Practice, Land Use Strategies and Sustainable Outcomes?
- Does the development consider:
  - alternative sites where it is in an area of medium bushfire risk; and
  - the risk to people and property?
- Is the development constructed of appropriate materials?
- Are appropriate firebreak setbacks provided between buildings and structures, including houses and infrastructure and bushfire risk areas?
- Is there adequate water supply and pressure and other appropriate infrastructure to protect a building or infrastructure from a fire?
- Does the development have a bushfire management plan, which includes the type of fire regime required to manage the ecological processes within the natural environments?

3.6.6 Land Use Projects

To protect Ugar's existing development and infrastructure and to assist in further studies of the Investigation Areas, the following projects are recommended:

- Implement a bushfire management plan that covers at a minimum:
  - the establishment of firebreaks or control lines around grassland areas and long-term dry vegetation types in areas adjacent to human settlements;
  - controlled burning outside of the driest periods when slow, low-intensity fires can be managed;
  - mosaic burning (e.g. small patches of controlled burning to reduce excess fuel load accumulation so that there is always habitat connectivity provided); and
  - fuel load maintenance; and
  - the need for fire trails and the potential impact on pristine natural environments.
- undertake Community capacity building on:
  - sustainable fire management; and
  - property preparedness including planning for and maintenance requirements.

3.6.7 Sustainable Bushfire Outcomes

Development is planned and managed to ensure that significant adverse effects of bushfire on the natural and man made environments are avoided, mitigated or remedied.

3.6.8 Useful Resources

Policies, Guidelines and Fact Sheets

State Planning Policy 1/03 – Mitigating the Adverse Impacts of Flood, Bushfire and Landslide sets out the State government's interest in ensuring the natural hazards of flood, bushfire and landslide are adequately considered when making decisions about development.
www.dip.qld.gov.au/policies/index.php

Your Bushfire Action Checklist provides a list of tasks individuals and the community should do both during the bushfire season and out of season to ensure that if a bushfire occurs, minimum damage is done to property.
http://www.fire.qld.gov.au

Websites

Queensland Fire & Rescue Service
www.fire.qld.gov.au

Queensland Department of Emergency
www.emergency.qld.gov.au

Cultural **Heritage**

4.1 Best Practice

- Places of cultural heritage significance are identified, protected and retained for the benefit of present and future generations.
- Traditional Owners:
  - are the primary source of information on the value of their heritage and how this is best conserved;
  - must have an active role in any heritage planning process;
  - own intellectual property and other information relating to their culture and heritage; and
  - are the key stakeholders in land use planning through their relationship with land and sea management and resources.
- Reduce the impacts of climate change on the community's cultural heritage by:
  - recognising the importance of climate change to the community's cultural heritage;
  - avoiding quick decisions now that will make it more difficult to manage climate change risks in the future; and
  - building understanding and capacity of the community to deal with the impacts of climate change on the Island's cultural heritage

4.2 Overview of Current Situation

The entire island of Ugar is an area of significant cultural heritage value to the Traditional Owners and the people of Ugar, the Ugarem Le.

While many significant and sacred sites are only known to Traditional Owners, a number of sites have been made known to the general public including:

- old village sites;
- middens;
- stone fish traps;
- horticultural sites;
- stone carvings;
- storyplaces, e.g. Wind Rock; and
- zogo and kod sites.

On Ugar is a small sacred rock referred to as the "Wedding Rock". This is located on the street very close to the front boundary garden in front of Lot 30 and 102 on Rankie Street. Any future construction work should be careful not to disturb the stone.

In 2003, Council indicated that the tree and stones in front of Lot 32 also held special significance to the community. The community also advises old grave/cemetery sites exist near the solid waste site and near the south beach.

To protect the cultural significance of these sites, the locations of these sites have not been disclosed.

Further details on Ugar's culturally significant places and sites are included in Appendix 3.

The cemetery is located at on the eastern side of the island.

Map 10 shows the traditional place names for Ugar.

Map 10 Traditional Place Names (Ugar)

For more detail, refer to Map No. 9964-1407 contained in Maps.

"In the Torres Strait, cultural heritage includes all traces of human activity in the physical environment. These are irreplaceable sources of information on people's lives and activities and on the historical development of crafts, techniques and art. Because monuments, site and culturally significant environments are non-renewable resources, their management must have a long-term focus. Cultural monuments and significant sites are a source of emotional and aesthetic experiences for many people and today Island Communities can benefit from the preservation and active use of its cultural heritage"

4.3 Issues Overview

Cultural heritage is about places of significance to people and helps us to understand the past and enrich the present. In the Torres Strait, there are areas of particular significance to people because of island custom (Ailan Kastom) and history, including contemporary history. They may be meeting places, monuments and landscapes. Areas of cultural significance may not be physically evident. With regard to Torres Strait Islander tradition, given the sacred nature of areas of significance, many sites have not been recorded on official heritage inventories and registers that are accessible to the public. Hence, without consultation and liaison with Traditional Owners, engagement of cultural heritage observers and preparation of cultural heritage investigations, areas of significance may be inadvertently damaged or destroyed.

On Ugar, there are numerous areas and objects of significant cultural, historical and archaeological significance. It is likely that the location of many of these have not been recorded. The Torres Strait Islander Cultural Heritage Act 2003 provides blanket protection for Torres Strait Islander cultural heritage and its "Duty of Care" provisions require those conducting activities to take all reasonable and practicable measures to avoid harming it. Communication with the relevant PBC will assist developers to identify local areas and objects of significance and avoid or mitigate disturbance. The TSRA, through its LSMU and Native Title Office can assist in contacting the relevant PBC.

Given the nature of major development projects in the Torres Strait, the reality is that development often proceeds without undertaking appropriate studies, consultation or engagement of observers. As such, it is vital that any applicant of a development undertake their duty of care obligations and engage with Ugar's Traditional Owners in order to manage and protect their unique areas of cultural significance.

Engagement and partnerships with Community provides opportunities for information sharing and effective management of cultural values and heritage. Information about places of cultural heritage significance must be managed in a way that satisfies the custodians of the area and ensuring that there is access to sufficient data to ensure proper management and protection of Ugar's cultural heritage.

Not only are areas of significance at risk from development but also from impacts from storm surge, inundation and erosion, particular sites which are located close to the coastline such as middens and other low lying sites. The intensification of environmental impacts associated with climate change may result is some areas of significance being submerged or eroded. The existing cemetery is one case in point. Decisions need to be made whether or not the cemetery should be expanded in its present location or be relocated to avoid the tidal and storm surges.

4.4 Land Use Strategies

To protect Ugar's cultural heritage from proposed development, the following strategies are recommended:

- All proposed developments must be discussed with the PBC on the potential impacts of the development on cultural heritage.
- A written agreement (e.g. cultural heritage management plan) be prepared as part of the development proposal which addresses:
  - genuine consultation with the community to determine how they wish to safeguard and control their culture and/or heritage;
  - how the development will protect the culture and heritage item or place;
  - the requirement for a cultural heritage survey prior to development proceeding;
  - the role of the PBC and Traditional Owners as observers during construction to monitor the impact on the culture and heritage items;
  - methods such as temporary markers that identify a buffer zone around the heritage item or place that must be removed after the building has been completed;
  - a remediation plan which outlines how and when a cultural heritage item or place will be reinstated if removed or damaged during construction; and
  - a 'sign off' process after construction is completed. This sign off must ensure that all parties are satisfied with the condition of the cultural heritage item or place is left in after construction is completed.
- All proposed developments must:
  - include the written agreement such as a cultural heritage management plan; and
  - undertake a site inventory including a search of NRW and the PBC's records.
- The community must identify, conserve and manage places of significant cultural heritage particularly those affected by natural hazards and determine which information is readily or not available for general public knowledge.
- The precautionary principle should be adopted where there is uncertainty about the cultural significance of an area or a site.
- All processes, policies and decisions that protect and enhance the natural and man made environments must incorporate cultural values and beliefs and the role of Traditional Owners in Ugar's cultural heritage.

4.5 Land Use Considerations

In assessing the impacts of future development on Ugar, the following key questions are to be raised. If the answer to any of the questions is 'NO', the proposal must, a) justify the inconsistency, b) be amended, or c) not be accepted.

- Is the development in accordance with the Cultural Heritage Best Practice, Land Use Strategies and Sustainable Outcomes?
- Is the proposal likely to affect
  - the Wedding rock in front of lot 102?
  - The trees and stone in front of Lot 32?
  - The use, enjoyment or visual amenity of the church on the foreshore?
- Ugar is a significant area of cultural heritage to Community, so have all appropriate persons and State agencies been consulted?
- Does the development have an agreed cultural heritage management plan for the affected area and/or site?
- Where the development threatens a cultural heritage item, does it have a disaster mitigation plan? If it does, does it address where disturbance is unavoidable, the temporary relocation of the implement to a safe place?
- Does the development threaten the integrity and setting of heritage items through water run off, soil erosion or soil movement?

4.6 Land Use Projects

To protect Ugar's cultural heritage, the following projects are recommended to be undertaken.

- A systematic, island focused cultural heritage survey. This survey should:
  - identify the nature and location of major cultural heritage sites and their likelihood of being affected by changes in land use; and
  - consider the confidentiality of such information (should it remain confidential solely for the use of the PBC, or be made publicly available).
- An analysis of the future of the existing cemetery.
- Facilitate opportunities for young people to build understanding and capacity about Ugar's areas of cultural significance.

4.7 Sustainable Indigenous Cultural and Heritage Outcomes

- Development is planned and managed to ensure impact on the culture and heritage of the community is avoided, mitigated or remedied.
- The impact of climate change on the community cultural heritage is managed in a sustainable and integrated way to provide appropriate solutions.
- Ensure Community are involved in ongoing consultation to support the protection and healing of country and culture for future generations.

4.8 Useful Resources

Legislation

Torres Strait Island Cultural Heritage Act 2003 (Qld) provides for the effective recognition, protection and conservation of Torres Strait Island cultural heritage.
www.legislation.qld.gov.au

Queensland Heritage Act 1992 (Qld) provides for the conservation of historical (non-indigenous) cultural heritage
www.legislation.qld.gov.au

Policies, Guidelines and Fact Sheets

Duty of Care and Management Plan Guidelines – Aboriginal Cultural Heritage Act 2003 sets out reasonable and practical measures for meeting the duty of care obligations established in the Aboriginal Cultural Heritage Act 2003.
www.derm.qld.gov.au/cultural_heritage/legislation/duty_of_care.html

Cultural Heritage – Your Duty of Care explains the duty of care provisions under the Aboriginal Cultural Heritage Act 2003.
www.derm.qld.gov.au/factsheets/pdf/cultural_heritage/ch16.pdf

Cultural Heritage provides an overview of the Torres Strait Islander Cultural Heritage Act 2003.
www.derm.qld.gov.au/cultural_heritage

Aboriginal and Torres Strait Islander Cultural Heritage Places introduces the different types of cultural heritage places and sites e.g. middens, grinding groves etc.
www.derm.qld.gov.au/cultural_heritage/significant_places/records_management.html

Cultural Heritage Management Plan explains what a cultural heritage management plan is and when one is required.
www.derm.qld.gov.au/cultural_heritage/legislation/cultural_heritage_management_plans.html

Cultural Heritage Database and Register explains what the cultural heritage database and register is and how entries are processed.
www.derm.qld.gov.au/factsheets/pdf/cultural_heritage/ch5.pdf

Cultural Heritage Studies provides an overview of why it is important to include sites of cultural significance on the cultural heritage register.
www.derm.qld.gov.au/factsheets/pdf/cultural_heritage/ch6.pdf

Ask First: a guide to respecting Indigenous heritage places and values is a guide to providing effective recognition, protection and conservation of Indigenous cultural heritage.
www.environment.gov.au/heritage/ahc/publications

Publications

Lawrie, M. (1970). Myths and Legends of Torres Strait. St. Lucia: University of Queensland Press.

McNiven, I.J. and Quinnell, M. (eds) (2004). Torres Strait Archaeology and Material Culture. Memoirs of the Queensland Museum (Cultural Heritage Series) 3(1).

Tekse, T. (1987). Island of Torres Strait: Stephens. Qld: Far Northern Schools Development Unit

Websites

Department of Environment and Resource Management
www.derm.qld.gov.au

National Native Title Tribunal
www.nntt.gov.au

Australian Heritage Council
www.environment.gov.au/heritage/ahc

The **Community**

Demographic trends and changes have significant influence on future development needs, the provision of community services and infrastructure. For example, if the population is ageing, then planning must ensure that the housing choice reflects the needs of an ageing population as well as ensuring the right community services, facilities and infrastructure is in place to support the ageing

Other topics such as community belonging, crime and safety, disability, food security and health are not addressed in this Plan as it is outside the scope of the project. It is recommended that a community wellbeing report be developed through a comprehensive community engagement process, as it would highlight the needs, concerns and aspirations of Community that will influence future development.

This Plan addresses the following with regards to the community:

- population;
- housing;
- sustainable community expansion; and
- community facilities and services.

5.1 Population

5.1.1 Best Practice

- Population and development are dealt with in a unified and comprehensive way with each Community developing its own solutions to population trends that reflect their values and cultural heritage.
- Land use development aligns with population profiles and trends.

5.1.2 Overview of Current Situation

The resident population of Ugar has increased in the past ten years as indicated in Table 2.

As confirmed by the figures in Table 2, in the last decade (1996 to 2006), Ugar's population increased by around 29%. Figures from the period from 2001 to 2006 suggest the growth has increased considerably in the last five years.

In 2006, the total population of Ugar was 83, an increase of 22 persons (26.5%) from the 2001 Census (61).

The growth rate was 6.4% or 4.4 persons per year in the 5 years between 2001-2006.

The growth rate was 3.5% over the 10 years to 2006.

According to the Australian Bureau of Statistics, due to poor completion rate of the 2006 Census, there are no population characteristics available for Ugar.

Table 2 Population Growth

Year	Population	Growth / Year (%)	Population Density: persons/km^2
1996	59	NA	NA
2001	61	0.7	NA
2006	83	6.4	83

Source: ABS, 1996, 2001 and 2006, PIFU2007

5.1.3 Land Use Strategy

FTo ensure that population trends and profiles are reflected in land use planning on Ugar it is recommended the population capacity, profiles and trends are reviewed regularly and appropriate adjustments made to ensure that an appropriate land supply and housing types are maintained.

5.1.4 Sustainable Population Outcomes

- Population profiles and trends are used to inform land use policy planning and development decision-making processes.
- Population and development capacity support a sustainable environment.

5.1.5 Useful Resources

Websites

Australian Bureau of Statistics (Census data)
www.abs.gov.au

Queensland Government Planning Information and Forecasting Unit
www.dip.qld.gov.au/our-services/planning-information-and-forecasting.html

5.2 Housing

5.2.1 Best Practice

- Provide a range of housing choices and opportunities in locations where there is a cost effective and efficient use of existing infrastructure and not be adversely impacted by natural hazards and climate change.
- Housing choices and stock matches demand and supply.
- Identifying new areas for residential development that provides a mix of housing types and densities without an adverse impact on existing infrastructure and the natural environment.
- Promotion and incorporation of sustainable design.
- Reduce the impacts of climate change on the community housing by:
  - recognising the importance of climate change on the community's housing;
  - avoiding quick decisions now that will make it more difficult to manage climate change risks in the future; and
  - building understanding and capacity of the community to deal with the impacts of climate change on housing.

5.2.2 Overview of Current Situation

Ugar's housing stock varies in size, architectural style, height and age. The simple architectural style, neat gardens and the clean streets give a feeling of community pride.

As with other Torres Strait islands, the houses located in the village are one or two storey strutures, generally containing three to five bedrooms. The older homes are of fibro construction built on short concrete stumps, while the more recently built homes are slab-on-ground, two storey, timber construction dwellings. Single storey dwellings are scattered throughout this area. Structures are in various states of repair from those unoccupied and in disrepair to those recently constructed with well-attended gardens.

Housing density varies throughout the village with no distinct area of higher density.

There are 26 houses on Ugar for approximately 90 persons (3.5 persons per house).

Additionally there is a guesthouse opened in November 2003 containing 4 single dwellings.

There are 10 vacant serviced lots within the village (lots 7,14,18,21,39,40,41,42,44,48).

Of these, Lot 44 adjoins the Community Centre and is located opposite the Council, so it could be considered for some type of future community use.

Guest House

5.2.3 Issues Overview

Growth pressure on Ugar will be generated through population increases and the changing population structure. Although the existing population is somewhat protected from changing coastal conditions such as rising sea levels due to the separation of the village from the coast, future development to accommodate an increased population will inevitably have some environmental impacts.

Due to the changing nature of the coastline, it is not recommended that future development be provided in coastal locations, however any expansion of the existing village must also consider the impact of vegetation clearing on soil stability and the protection of native flora and fauna.

Refer to Section 5.3 Sustainable Community Expansion for more information.

Accommodating a changing population and preserving the land and sea relationship represent two key challenges for the Ugar community, which will require the provision of diverse, sustainable, affordable housing options and a range of site sizes.

Providing a range of housing choice assists in creating diverse communities and preventing social polarisation and displacement as well as protecting the natural environment. For example, it is important that affordable housing not be marginalised to fringe areas. It should be well located in relation to transport, community facilities and services, open space and recreation and education and employment opportunities.

In providing housing stock and choice to cater for the population growth, the impact on the capacity of the existing landfill and water supply must be taken into account.

Refer to Section 6.1 Water and Section 6.3 Waste for more information.

5.2.4 Land Use Strategies

To enable housing demand and supply to meet the population growth, the following strategy is recommended:

- Provide residential land to enable a supply of diverse, affordable and sustainable housing to meet the needs of current and future residents and visitors.

5.2.5 Land Use Considerations

In assessing the impacts of future development on Ugar, the following key questions are to be raised. If the answer to any of the questions is 'NO', the proposal must, a) justify the inconsistency, b) be amended, or c) not be accepted.

- Is the development in accordance with the Natural Environment, Cultural Heritage, Community and Infrastructure Best Practice, Land Use Strategies and Sustainable Outcomes?
- Is the development integrated with the landform and landscape?
- Does the development use:
  - energy efficiency principles in design;
  - minimise the reliance on fossil fuels for thermal comfort and water heating; and
  - minimise the use of materials, which deplete natural resources or create toxic pollution in their manufacture, use or disposal?
- If the development requires the demolition of an existing building, are the materials of the existing building to be reused? If so, where? If not, how are the materials to be disposed?
- Does the development provide sufficient onsite vehicle, boat parking and access areas for residents?
- If the development is in the nominated investigation area, is all necessary infrastructure in place and operational for the development to proceed?
- Are all existing serviced lots utilised prior to developing new lots?

5.2.6 Sustainable Housing Outcomes

- Plan and manage urban area growth by limiting development along the coast and encouraging new development inland.
- Provide suitable residential land to enable a supply of diverse affordable and sustainable housing to meet the needs of current and future residents and visitors.
- The provision of a diverse choice of sustainable housing which:
  - provides a high standard of sustainable living;
  - provides a variety of different residential lifestyle opportunities; and
  - is responsive to climate, landscape and the changing population structure of the community's population while being affordable.
- Areas for residential use are developed to be consistent with the planned capacity for roads, community services and infrastructure for the island.

5.2.7 Useful Resources

Policies, Plans & Guidelines

Demographic Profile, Queensland Torres Strait Islander Communities provides an overview of the 1996 to 2001 Census data for the 17 Torres Strait Islands.
www.dip.qld.gov.au/population-forecasting/indigenous-population-trends.html

State Planning Policy 1/07 – Housing and Residential Development sets out the state government's interest in ensuring that local governments identify their community's housing needs and analysis and modify if necessary, their planning schemes to remove barriers and provide opportunities for housing options that respond to identified needs.
www.dip.qld.gov.au/policies/index/php

Websites

Australian Bureau of Statistics (Census data
www.abs.gov.au

5.3 Sustainable Community Expansion

5.3.1 Current and Predicted Growth Overview

The population of approximately 90-100 persons is expected to grow between a low rate of an additional 2 persons/year, being an additional 22 people between 2009-2019 and a high rate of 4 persons/year, being an additional 48 people between 2009 and 2019.

In summary, over the next 10 years, the population of Ugar is predicted to be between 122-148 people requiring between 4-10 new houses.

Table 3 shows the estimate population growth and housing demand for Ugar over the next 10 years.

Table 3 Estimated Population Growth and Housing Demand

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	addit. persons	addit. houses at 5pph
Low growth 2.0%	100	102	104	106	108	110	112	115	117	119	122	22 persons over ten years	4 houses over ten years
High Growth (4.0%)	100	104	108	112	117	121	126	131	137	142	148	48 persons over ten years	10 houses over ten years

Source: ABS 2006

This Plan considers two growth scenarios based on a low growth rate of 2.0% and a high growth of 4.0 % for the next ten years.

- a low growth rate of 2.0% which will generate:
  - an extra 22 persons over ten years;
  - an additional 4 houses over ten years; and
  - additional housing need of 0.4 houses per year at an average of 5 persons per household.
- a high growth rate of 4.0% which will generate:
  - an extra 48 persons over ten years;
  - additional 10 houses over ten years; and
  - additional housing need of 1.0 house per year at an average of 5 person per household.

5.3.2 Issues Overview

Under any scenario, it is anticipated that the population of Ugar will increase over time.

The expansion of the village needs to be carefully managed due to its impact on the environment, the risk of erosion problems and habitat loss if vegetation is cleared and the potential risk of tidal inundation, storm surges and other natural hazards.

No specific population age statistics are available for Ugar, however if the island community follows general population trends (which other islands in the Torres Strait are anticipated to do) it is likely that family homes will still be required for at least the next five years.

Some of the options available to manage growth on Ugar are:

- using existing vacant lots
- increasing residential density in the village
- expanding the residential areas

Table 4 Estimated Number of Present and Potential Residential Lots

Village	Existing Houses	Vacant Lots Above DSTE	Vacant Lots within Low Hazard Area	Vacant Lots within High Hazard Area Above HAT2100	Vacant Lots within High Hazard Area below HAT2100	Vacant Lots within High Hazard Area below HAT2009
Within Village	26	10	-	-	-	-
Near guest house	-	4	-	-	-	-
West of Ergon	-	12	-	-	-	-
Total	26	26				

Using Existing Serviced Lots

If the population on Ugar continues to increase, the existing 10 vacant lots in the village will need to be developed to provide houses for the growing population.

The existing 10 serviced lots will cater for an additional 50 people, which is at the high growth scenario predicted population of Ugar of 148 for 2019.

Increase Residential Density

Increasing density is generally undertaken by providing a mix of housing types that use less land than a 3-bedroom dwelling house. Examples include dual occupancies (duplex or a house with two units), townhouses or units. The benefits of increased residential density include:

- more economic use of existing infrastructure and serviced land;
- reduced need for investment in new infrastructure;
- better access to existing services and facilities;
- combining existing land patterns whilst increasing the number of people living on Ugar; and
- more sustainable housing patterns.

Expansion of the Residential Areas

As previously outlined, the existing village is separated from coastal areas and coastal expansion of the village is inappropriate due to the negative impacts on the environment and the potential risks from tides and storm surge inundation or other natural hazards. Residential development needs to occur inland from the coast, however the associated clearing of vegetation is likely to raise concerns about soil stability and erosion.

Two potential areas for expanding the village have been identified.

Investigation Area 1 - Adjoining the guesthouse

Four additional lots can be provided in the area adjoining the guesthouse and behind lots 30-33 on Rankie Street. Development in this area would be close to water and power services and would be on the main road to the airstrip.

This Investigation Area will need to address as a minimum the following:

- Possible impact of runoff affecting the bore water catchment areas
- bushfire risk;
- impact on cultural heritage; and
- impact on vegetation and habitat corridors.

Investigation Area 2- West of Ergon generator

- Looking ahead to the land requirements on Ugar after the next 10 years (assuming that the existing vacant lots are used in the next 10 years) there is a possible area for development situated on the airport Road and to the west of the Ergon generator.
- Note that access to this area should be off the road that leads northwards towards the house on lot 36.
- The investigation area has been located so that it is outside of the water catchment area.
- Approximately 12 new vacant lots can be provided.

This Investigation Area will need to address as a minimum the following:

- Possible impact of runoff affecting the bore water catchment areas
- bushfire risk;
- impact on cultural heritage; and
- impact on vegetation and habitat corridors.
- The impact of noise from the Ergon generator affecting new residences.

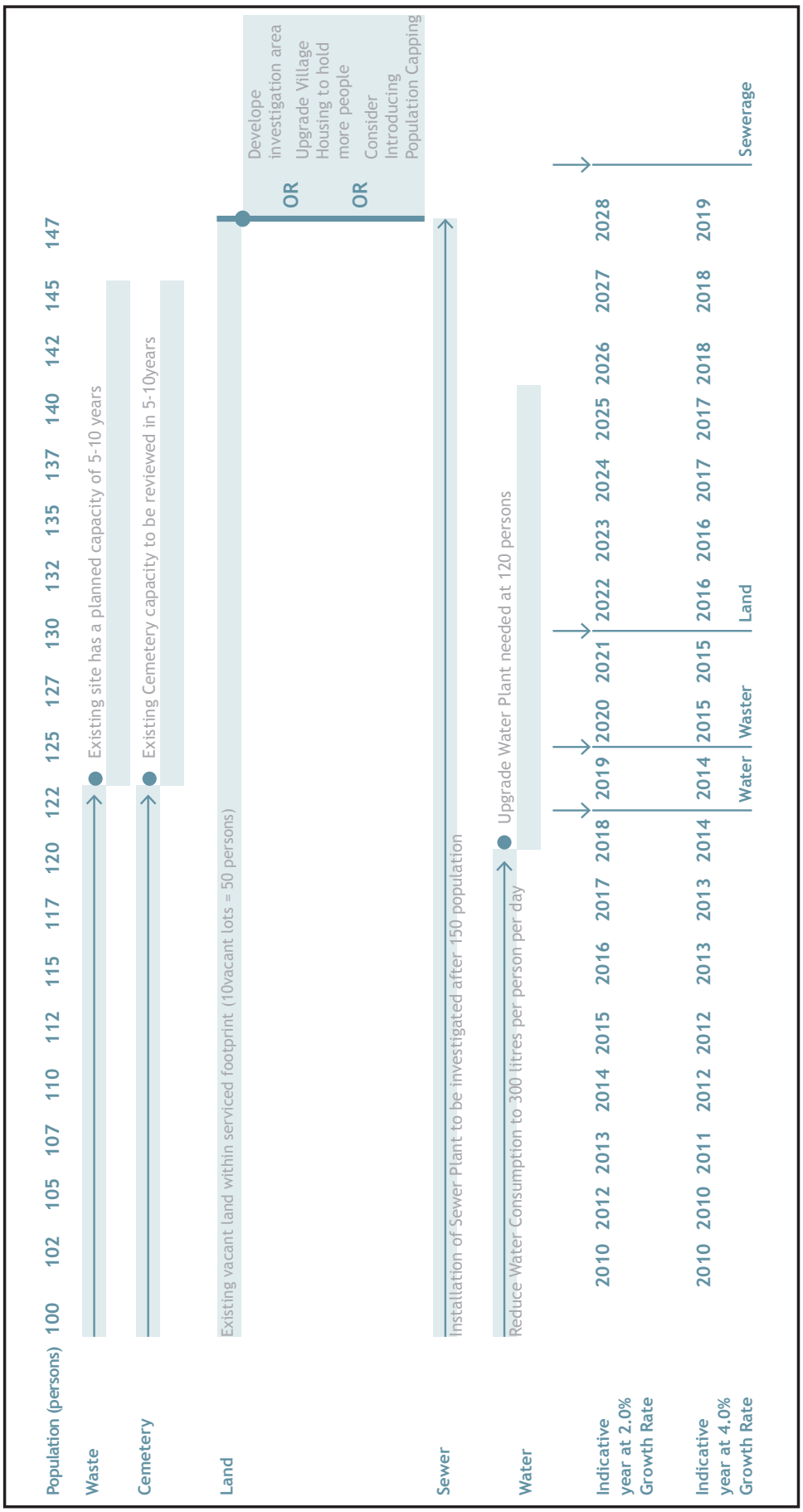
5.3.3 Infrastructure Capacity

The demand for new infrastructure is usually dependent upon the size of the population.

As a community grows it will require either new infrastructure, or upgrades to its existing infrastructure (eg water treatment plants).

Figure 10 shows the expected demand for new infrastructure relative to the population size.

Figure 10 Infrastructure Capacity Relative to Population Growth



5.3.4 Land Use Strategies

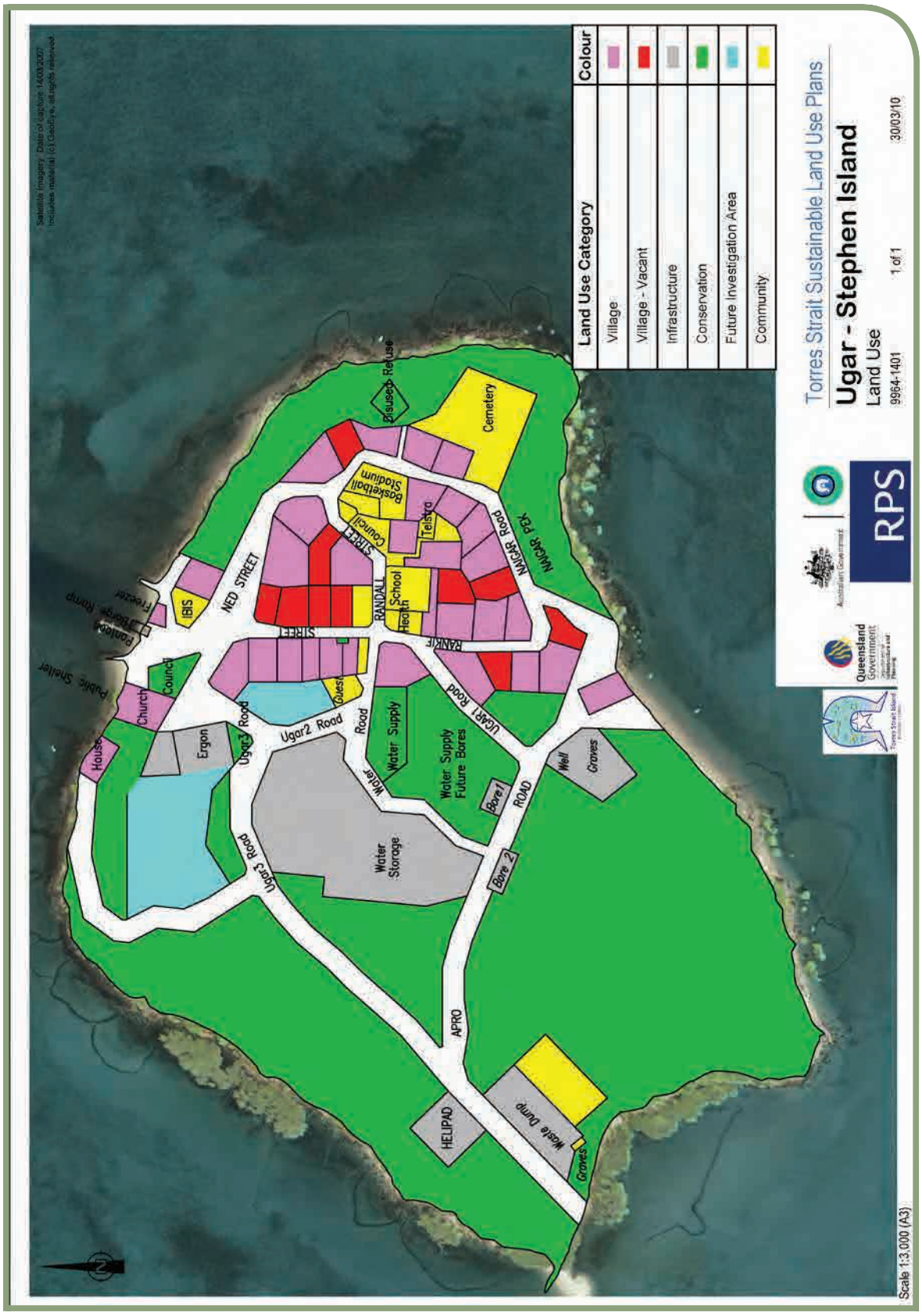
The population trends and profiles and infrastructure limitations mean that the land use strategies must be developed to:

- Manage the total population trend in a way that retains urban and island character.
- Identify and locate land suitable for urban development in non-coastal areas. One investigation area has been identified with three other areas extending the existing village.
- Provide choice in housing form and affordability in appropriate locations.
- Increase the residential density in the village without comprising the amenity and character of the village and increasing the risk to natural hazards such as storm surge and tides.

Map 11 shows the future land use intent for lots within the village.

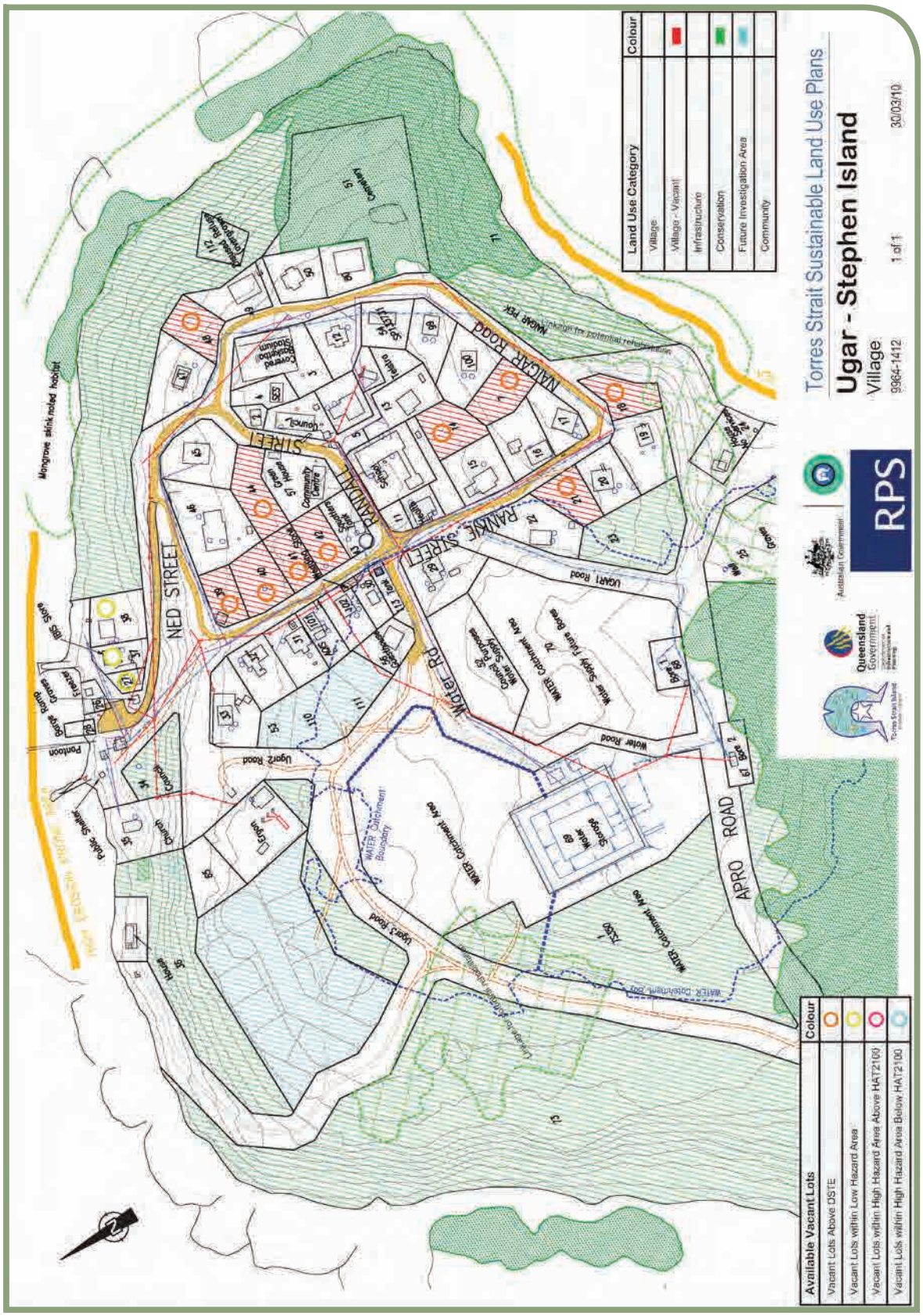
Map 12 shows the lots, which are presently suitable for development due to access to services. These lots are shown as “Village”. Areas that may be suitable for development in the future, subject to further investigation and/or once services have been provided, are shown as “Investigation Area”.

Map 11 Land Use



For more detail, refer to Map No. 9964-1401 contained in Maps.

Map 12 Land Use (Village)



For more detail, refer to Map No. 9964-1412 contained in Maps.

5.3.5 Land Use Considerations

In assessing the impacts of future development on Ugar, the following key questions are to be raised. If the answer to any of the questions is 'NO', the proposal must, a) justify the inconsistency, b) be amended, or c) not be accepted.

- Is the development in accordance with the Sustainable Community Expansion Best Practice, Land Use Strategies and Sustainable Outcomes?
- Does the development consider its impact on population capacity, profile and trends and the effects of growth and change on Ugar?
- Is the development consistent with the strategies developed to address development growth?
- Does the development satisfactorily address its impact on the water catchment area (noting that water supply is primarily by bores)?

5.3.6 Land Use Projects

To determine where high density, residential development should occur in the village, a residential strategy should be developed.

5.3.7 Sustainable Community Expansion Outcomes

- Decision making focuses on reducing the impacts of population growth and development on natural resources and the environment.
- A highly liveable community where there are a range of services and activities for all people who work together to identify, prioritise and address community issues.

5.4 Community Facilities and Services

5.4.1 Best Practice

- Communities are created with a recognisable character and sense of place which have a high level of amenity, safety, connectivity and integration between existing and new places.
- Create well-designed, safe and healthy environments that encourage active community participation, promote healthy lifestyles, prevent crime and maintain social equity and diversity.
- Maximise access to appropriate social and retail infrastructure for all residents.
- Reduce the vulnerability of existing and future community facilities and services to the impacts of climate change by:
  - avoiding decisions now that will make it more difficult to manage climate change risks in the future;
  - building understanding and capacity of the community to deal with the impacts of climate change on their community facilities and services; and
  - providing community facilities and services in locations not adversely impacted by natural hazards.

5.4.2 Overview of Current Situation

According to the Australian Bureau of Statistics, due to poor completion rate of the 2006 Census, there are no current employment figures available for Ugar.

Table 5 shows the types of employment sectors people work in.

Table 6 shows the community facilities that are available on Ugar.

Table 7 shows the retail and public office facilities and services that are available on Ugar.

Table 8 shows the recreational facilities that are available on Ugar.

Table 5 Employment Sectors

Employment Industry	Construction	Public Administration & Safety	Education & Training	Health Care & Social Assistance	Wholesale Trade	Retail Trade	Other	Not Stated
People	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Source: unavailable

Table 6 Community Facilities

Facility	Provided (✓ = Yes; ✗ = No)	Location
Pre school	✓	Part of Primary school
Primary School	✓ (12 students)	Lot 8 Randall St
Health Care Centre	✓	Lot 11 Cnr Randall and Rankie St
High school	✗	
Child Care Centre		

Table 7 Retail and Public Office Facilities and Services

Facility	Provided (✓ = Yes; ✗ = No)	Location
Administration offices/Workshop	✓	Lot 1 Randall St
Community hall	✓	Lot 57
Guest House	✓ 4 rooms	Lot 56
Contractor Accommodation	✗	
Churches	✓	Lot 35 on foreshore
SES depot	✓	Lot 4
Supermarket (IBIS store and or Convenience store)	✗	No stores on Ugar – Shopping done on nearby Erub or delivery by barge
Banking facilities	✓	At Council
Custom Depot	✗	
Police Station		

Table 8 Recreational Facilities

Facility	Provided (✓ = Yes; ✗ = No)	Location
Picnic Grounds	✗	
Sports Oval	✗	
Sports Courts	✓	Outdoor but covered basketball stadium

5.4.3 Issues Overview

On Ugar, there are strong links between the physical environment, socio-economic issues and community health and wellbeing. Best practice planning and design of the built environment encourages physical activity and healthy lifestyle choices, provides a sense of community safety and assists in crime prevention. Communities that contain a broad mix of housing choices, appropriate local support services, adequate social infrastructure and strong community networks tend to be safer communities. This makes it vital that planning policies for community facilities and open space encourage multiple use and flexible design to allow for changing needs.

The community does not have any shops to buy food or items for convenience goods and services that meet the normal daily needs of its residents (e.g., food, personal services and prescription drugs). All items required are purchased at either Erub and transported by dinghy, or ordered and delivered fortnightly by the local Sea swift barge service.

The Island Industries Board (Islanders Board of Industry and Service - IBIS) wants to re-establish a shop on Ugar (the previous store was located on Lot 27 & 37 near the barge ramp and was closed in 2003) and is awaiting native title approval to do so.

5.4.4 Land Use Considerations

IIn assessing the impacts of future development on Ugar, the following key questions are to be raised. If the answer to any of the questions is 'NO', the proposal must, a) justify the inconsistency, b) be amended, or c) not be accepted.

- Is the development in accordance with the Natural Environment, Cultural Heritage, Community and Infrastructure Best Practice and Sustainable Outcomes?
- Is the development part of multipurpose community facilities and services?
- Can the development respond to changing and emerging community needs?
- If the development is for a new residential area, is there adequate provision made for public spaces and places for community activities?

5.4.5 Sustainable Community Facilities and Services Outcomes

- Community facilities that recognise and reflect the needs of the resident population including people with special needs such as older people, children, low-income earners and people with disabilities.
- New and existing residential areas are provided with community and social facilities that are convenient and highly accessible to the community residents.
- Community is involved in the planning of community building and spaces to promote ownership and pride.
- Existing and new community facilities are multiple use buildings and not located in areas identified as impacted by natural hazards.
- Local sport and recreational opportunities continue to focus on natural and cultural activities.

Infrastructure

Providing and managing infrastructure is a key issue facing the Torres Strait and Ugar is no exception. For sustainable land uses and a healthy community, a close and strong relationship between policies and strategies is required.

Infrastructure plays a vital role in linking island communities within the region and mainland Australia. As a physical resource of strategic importance, infrastructure needs to be protected from any adverse effects (that may arise from land uses, natural hazards and climate change) that could affect the provision of an integrated, safe, responsive and sustainable infrastructure system. Similarly, negative environmental effects on land use activities resulting from infrastructure also need to be managed.

Infrastructure also has a significant role in the community and therefore land use and infrastructure planning whether for existing or future development must be provided in a way that is efficient, equitable, accessible and timely. On the other hand, demand and consumer behaviour must not be ignored to enable the maximisation of existing infrastructure and to minimise the need for additional infrastructure and services.

This Plan addresses the following with regard to infrastructure:

- water;
- sewer;
- waste;
- electricity;
- telecommunication;
- roads;
- drainage;
- air access; and
- sea access.

6.1 Water

6.1.1 Best Practice

- Water infrastructure is expensive to install and consideration must be given to the proximity of existing water infrastructure when planning future development.
- Protect and enhance the ecological health and water quality of surface and groundwater, including regional waterways, wetlands and estuaries.
- Development should not occur in water catchments.
- Water use should avoid or minimise land degradation, including soil erosion, compaction, geomorphic instability, contamination, acidity, water logging, decline of native vegetation or, where appropriate, salinity and, where possible, land should be rehabilitated.
- Water planning is based on a total water cycle management, which is reflected in all policy and decision-making and provides assured supplies of water to meet the reasonable needs of development and community.
- Promote efficient use of water by improving demand management and reusing and recycling water.
- All new infrastructure with a life of 10+ years should consider climate change risks now for function, design and location.
- Reduce the impacts of climate change on the community by:
  - recognising the importance of climate change on the community's water infrastructure;
  - avoiding quick decisions now that will make it more difficult to manage climate change risks in the future; and
  - building understanding and capacity of the community to deal with the impacts of climate change on the island water infrastructure.

6.1.2 Overview of Current Situation

The existing water infrastructure has the following features:

Source:	Water on Ugar is sourced from: • rainwater collected from the covered area of the storage lagoons located near the centre of the island; • 2 bores south of the lagoons; and • when required, a mobile reverse osmosis desalination unit located near the barge ramp
Treatment:	Water is treated via cartridge element filtration and chlorination at the treatment plant located adjacent to the lagoons.
Storage:	Collected rainwater is stored the lined and covered storage lagoons. Water from the bores is also stored in the lagoons before treatment. After treatment, water is pumped to the elevated 30kL header tank located in the town area.
Delivery:	Potable water is delivered to the community from the header tank generally via 80mm underground mains. All facilities are connected to the mains via branch lines and all facilities are individually metered.
Capacity:	The main source of water comes from the water collected on the covered area of the storage lagoons. The catchment area of lagoons is 3,456 m2. Based on an average rainfall of 1,450 mm/year, the average yield of the lagoons is around 5.0 ML per annum. The lagoon storage volume is approximately 4.9 ML, which is considered a reasonable match with the average yearly rainfall to contain a year's supply of water. The two bores have been recently refurbished and the design pump rate for each bore has been set at 14 kL per day running at 75% of the year to allow for natural recharge. The total safe yield from the two bores is 7.6 ML. The combined water supply for an average year is therefore approximately 12.6 ML. For the current estimated population of 100 people and the adopted average daily consumption rate of 300L/person per day, the average yearly demand for water is 11ML. Accordingly, the water supply from the lagoons and bores is considered appropriate for the existing population and for the short term future growth. The total existing elevated water storage capacity is 30 kL. For the design population estimate of 100 persons and the adopted average daily consumption rate of 300 L/person per day, there is approximately one days storage capacity, which is considered insufficient to meet water demand during periods of treatment plant breakdown and/or maintenance. The elevated water tank is in poor condition and it is understood that the tank and stand has been scheduled for replacement in the near future.
Usage:	The estimated current population is about 100 people. The most recent water consumption data indicates an average water consumption of 180 l/person/day. This rate is currently well below the target of 300 litres per person per day and if maintained, will negate the requirement for temporary desalination plant. The current water supply capacity appears to be adequate for the expected average water demand for the size of Community.

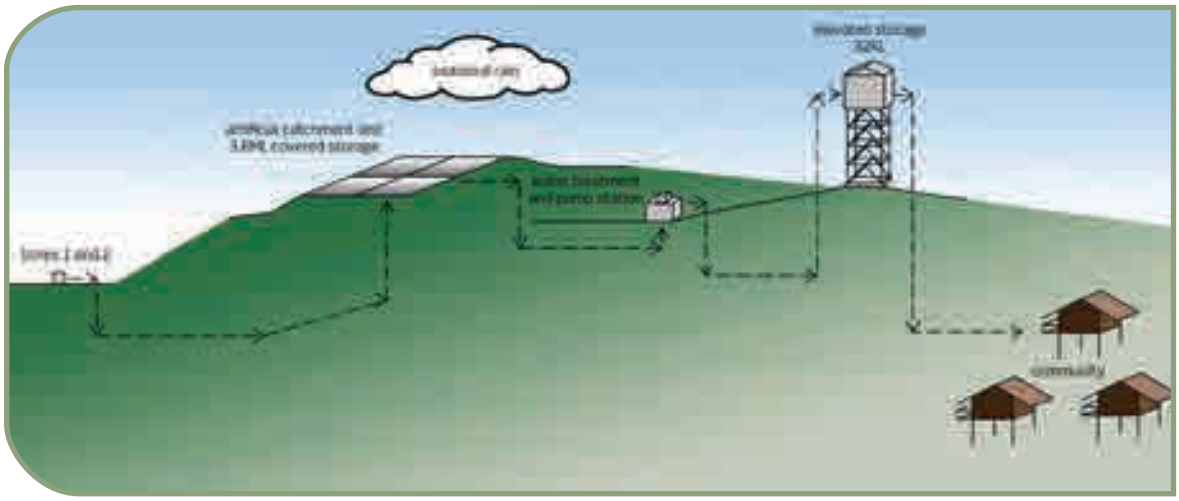
Map 13 shows the areas serviced by the existing water infrastructure.

Figure 11 shows the water scheme process.

Map 13 Water Infrastructure

For more detail, refer to Map No. 9964-1411 contained in Maps.

Figure 11 Water Scheme



6.1.3 Issues Overview

For the purposes of determining the existing and future capacity of the water infrastructure, the following population growth forecast is used:

Existing Population	2009	= 100 persons
Predicted Population	2019	(Low Growth Estimate of 2.0% = 122 persons)
Predicted Population	2019	(High Growth Estimate of 4.0% = 148 persons)

Water supply at Ugar is currently at a level where the collected rainwater and groundwater is sufficient to meet the current demand without the assistance of a supplementary desalination unit. This situation should remain provided the island receives average yearly rainfall and the water consumption remains below the accepted target of 300 L/person/day. If the system is maintained correctly and the bore production is managed in accordance with the acceptable yield limits, the system should be capable of providing adequate water for the next ten years assuming a low growth population increase

A high growth population increase will see the water supply under capacity. Should this be the case, consideration will be needed to increasing the supply through the addition of a new bore and/or the increase in size of the artificial catchment lagoons. In the short term, the use of a mobile desalination unit may be sufficient to top-up the lagoon during the dry season or periods of lower-than –average rainfall. If the requirement for a mobile desalination plant becomes a regular event, a formal plant hardstand area should be constructed, most likely adjacent to the barge ramp.

It should be noted that there are potential risks to the environment from the discharge of desalination plant effluent and that the potential impact increases with increase in desalination plant capacity. The wastewater discharge may affect coastal water quality due to the highly saline brine that is emitted to the sea, which may be increased in temperature, contain residual chemicals from any pre-treatment process and metal fragments from corrosion. However, the quantity of the discharge from this plant is generally considered negligible and too small to quantify, particularly due to the rapid dilution into the surrounding waters.

As with remote island communities, Ugar's water is expensive to source and treat and water infrastructure is expensive to install and operate. At 2008 prices, the cost to supply barged water is $14 per kilolitre (about 26 times the national average) and desalinated water is $7 per kilolitre (about 10 times the national average).

Care should be taken in considering any new development on Ugar to assess its impact on the bore water supply of the island.

6.1.4 Land Use Strategies

To minimise the impact of water infrastructure on the natural and man made environments and to ensure that the current and future efficiency and effectiveness of Ugar water infrastructure, the following strategies are recommended:

- Development is not to occur in water catchments.
- A target of 300 litres per person per day or less is achieved by using water efficiently and managing consumer behaviour and demand for water.
- On reaching a population of 120 persons and the target consumption of 300 litres per person per day or less is achieved on a regular basis, an upgrade to the water plant capacity is to be considered. Given the current population is approximately 100 this need could occur between 2014-2019.

6.1.5 Land Use Considerations

In assessing the impacts of future development on Ugar, the following key questions are to be raised. If the answer to any of the questions is 'NO', the proposal must, a) justify the inconsistency, b) be amended, or c) not be accepted.

- Is the development in accordance with the Water Best Practice, Land Use Strategies and Sustainable Outcomes?
- Does the development adopt best practice principles in the planning, design and construction of water cycle infrastructure (including water supply, sewerage, drainage and water quality)?
- Does the proposal address its impact and cumulative impact on the existing water infrastructure?
- If the development is for a residential or community building,
  - is there a total water cycle management system addressing demand, reuse and recycling including the use of rainwater tanks for use within the building; and
  - are water saving devices proposed?
- Is the water catchment area (if one exists) affected by the development?
- Is the development located within the area serviceable by current infrastructure? If not, is the required additional infrastructure adequately funded?

6.1.6 Sustainable Water Infrastructure Outcomes

- Achieve targeted reductions in water consumption by using water efficiently and managing consumer behaviour and demand for water.
- Protect the quality of water draining from urban development and water infrastructure.
- All water infrastructure is inspected regularly and maintained to ensure that it is in effective working order.

6.2 Sewer

6.2.1 Best Practice

- Sewerage infrastructure is expensive to install and consideration must be given to the proximity of existing sewerage infrastructure when planning future development.
- Sewerage treatment plant design must accommodate specific design capacities and the impact of additional loading from future development.
- All new infrastructure with a life of 10+ years should consider climate change risks now for function, design and location.
- Reduce the impacts of climate change on the sewer infrastructure by:
  - recognising the importance of climate change on the community's sewer infrastructure;
  - avoiding quick decisions now that will make it more difficult to manage climate change risks in the future; and
  - building understanding and capacity of the community to deal with the impacts of climate change on the community's sewer infrastructure.

6.2.2 Overview of Current Situation

Ugar is not currently serviced by a reticulated sewerage system.

All community sewage is treated via septic tanks and underground absorption techniques. The majority of septic tanks are reportedly operating satisfactorily due to the island topography, soil type and tank maintenance. Future development is proposed to occur in the existing town area where problems are minimal.

Consequently, there are no immediate plans to construct a reticulated sewerage system at Ugar, at least in the short term. The septic tank systems should function appropriately provided they are correctly designed, installed and maintained and that future housing blocks have sufficient areas allocated for the underground trenches

Map 14 shows the areas serviced by the existing sewer lines

6.2.3 Issues Overview

At present, there are no indications that the septic systems are having any adverse effect on the groundwater supply, however monitoring of the groundwater should continue to be undertaken to ensure that there is no groundwater contamination.

Additionally, future development should avoid the area surrounding the bores, that is, the area to the south of the storage lagoon in order to minimise the possibility of contamination.

Effluent Re-use

Effluent from the septic tanks is current dispersed underground through absorption trenches and as such, is not collected for remote disposal. Consequently, thee are limited opportunities to utilise the effluent for irrigation purposes. The provision of a common effluent drainage (CED) system is not considered practical, as the cost to install such a system is comparable to the provision of a reticulated gravity system / sewerage treatment plant.

Map 14 Sewer Infrastructure

For more detail, refer to Map No. 9964-1416 contained in Maps.

6.2.4 Land Use Strategies

To minimise the impact of sewer infrastructure on the natural and man made environments and to ensure that the current and future efficiency and effectiveness of Ugar sewer infrastructure, the following strategies are recommended:

- Not encouraging development to occur in close proximity to the bores.
- Sewer infrastructure must be provided in accordance with the Queensland Plumbing and Wastewater Code and AS/NZS1546:2008 On-site domestic wastewater treatment units – aerated wastewater treatment systems.

6.2.5 Land Use Considerations

In assessing the impacts of future development on Ugar, the following key questions are to be raised. If the answer to any of the questions is 'NO', the proposal must, a) justify the inconsistency, b) be amended, or c) not be accepted.

- Is the development in accordance with the Sewerage Best Practice, Land Use Strategies and Sustainable Outcomes?
- Does the development adopt best practice principles in the planning, design and construction of sewerage infrastructure (including water supply, sewerage, drainage and water quality)?
- Does the proposal address its impact and cumulative impact on the existing sewerage infrastructure?
- Is the development near or adjacent to an existing or proposed sewerage treatment plan?
- Is the development located within the area serviceable by the current infrastructure? If not, is the required additional infrastructure adequately funded?

6.2.6 Sustainable Sewer Infrastructure Outcomes

- Waste water conservation should be practised and waste water production should be minimised.
- All sewer infrastructure is inspected regularly and maintained to ensure that it is in effective working order.

6.2.7 Useful Resources

Policies, Plans & Guidelines

Queensland Plumbing and Wastewater Code sets out the framework for Queensland's plumbing and drainage standards.

www.dip.qld.gov.au/plumbing/2.html

AS/NZS 1546:2008 is the Australian Standard for on-site wastewater treatment units.

www.standards.org.au

6.3 Waste

6.3.1 Best Practice

- The siting and maintenance of waste disposal facilities (dump or tip) must not have a detrimental impact on the natural environment.
- Removal of waste from the community is expensive and the minimisation of waste and associated environmental impacts and maximisation 'reduce, reuse, recycle' of waste generated occurs on a daily basis.
- All new infrastructure with a life of 10+ years should consider climate change risks now for function, design and location.
- Reduce the impacts of climate change on the community's waste generation and disposal facilities by:
  - recognising the importance of climate change;
  - avoiding quick decisions now that will make it more difficult to manage the community's waste generation and disposal facilities; and
  - building understanding and capacity of the community to deal with the impacts of climate change on the community's waste generation and disposal facilities

6.3.2 Overview of Current Situation

Like many of the Torres Strait island communities, Ugar has limited space available for waste disposal. In 2006/2007, an upgrade of the existing waste disposal facilities was undertaken at specified Torres Strait communities, which in some instances required closure of the existing tips and provision of new landfill sites. The upgrades were intended to improve capacity and efficiency on the sites.

Currently, Ugar has a waste depot located on the western side of the island, past the helipad. The current waste management practice is a basic trench, burn and bury operation.

6.3.3 Issues Overview

Management:	The dump site is fenced and in late 2009 a firebreak was being maintained around it. All materials were being thrown into the trench. The dump needs to be better managed to sort and segregate non-putrescible materials (such as batteries, timber, building demolition waste etc). This would allow the trenches to contain only household rubbish.
Vehicles:	A significant issue for all Torres Strait Islands is the impact of disused vehicles once they have reached the end of their usable life. Typically, these vehicles are in poor condition when they reach the Torres Strait. Once broken down, they consume valuable space in the landfill sites. This space should be reserved for general domestic rubbish. Materials other than general domestic waste, should be separated and stocked piled so that they can be re-used or transported off the island. Quarantine restrictions imposed for the Torres Strait protected zones mean that any material transported between zones requires Australian Quarantine and Immigration Service clearance that usually involves removal of any dirt from old car bodies. This can be logistically difficult and expensive. Additional requirements of the Department of Primary Industries apply to the transfer of putrescibles matter between islands. Given the above, consideration should be given to imposing a levy on all vehicles brought onto the island. Such a levy could pay for the ultimate removal of the vehicle from the island.
Future Expansion:	The existing dump has a planned life of 5-10 years, depending on the amount of management and separation of materials that is undertaken. There is land available for expansion of the waste depot on Ugar immediately east of the new existing waste depot. This is the most suitable location on Ugar however; it requires the further destruction of vegetation and habitat of the western half of the island. At this stage, it is premature to investigate the impacts of this expansion, but the effect upon vegetation, habitat, Cultural Heritage and traditional ownership will need to be addressed when the expansion becomes necessary.

Alternative options include the introduction of a waste transfer station and removal of waste from Ugar to another site (such as Cairns, Horn Island or a yet to be determined regional waste depot) for the Torres Strait.

6.3.4 Land Use Strategies

To minimise the impacts of waste infrastructure on Ugar's natural and man made environments, the following strategies are recommended:

- Future landfills are located in geologically stable areas, not flood prone or adjacent to areas of high ecological significance or in areas identified as affected by natural hazards.
- Waste generation is avoided in the first instance. Where waste generation cannot be avoided, practices are implemented to reuse, recycle or recover wastes and materials prior to disposal.
- A voluntary target of reducing waste through recycling.
- Waste disposal to landfill is minimised through applying waste recovery techniques that gain optimum recovery of reusable and recyclable materials.
- Materials other than general domestic waste, should be separated and stocked piled to enable their re-use or transportation off Ugar.
- The waste depot should be operated on an "area-fill" method, where waste is spread out in sections or cells and progressively covered.

6.3.5 Land Use Considerations

In assessing the impacts of future development on Ugar, the following key questions are to be raised. If the answer to any of the questions is 'NO', the proposal must, a) justify the inconsistency, b) be amended, or c) not be accepted.

- Is the development in accordance with the Waste Best Practice, Land Use Strategies and Sustainable Outcomes?
- Does the development encourage conservation, composting and recycling of waste?
- Has the development considered the impact it will have on the capacity of the landfill site?
- If the development involves demolition of an existing structure, is the removal of
  - material from the island or its reuse; and
  - contractor's vehicles from Ugar at the end of the project addressed?

6.3.6 Land Use Projects

The following projects are recommended to be undertaken:

- A study to quantify the need for waste management capacity for all waste streams until 2020.
- Consider the cost and feasibility of a 'vehicle disposal levy' to cover the cost of removing abandoned vehicles from Ugar

6.3.7 Sustainable Waste Infrastructure Outcomes

- The development of an integrated and strategic approach to regional and local waste management.
- The volume of waste requiring disposal is reduced to a minimum, while maximising the economic value of resources during their life cycle through reuse, recycling, reprocessing and energy recovery.
- Any future landfills are located in geologically stable areas and are not flood prone or adjacent to areas of high ecological significance.
- Achieve targeted reductions in waste consumption by using waste efficiently and managing consumer behaviour and demand for waste.
- All waste infrastructure and landfill sites are inspected regularly and maintained to ensure that they are in effective working order.

6.4 Electricity

6.4.1 Best Practice

- Electric infrastructure is expensive to install and consideration must be given to the proximity of existing electricity infrastructure when planning future development.
- Provide energy generation production, transmission and distribution capacity to meet the needs of the population and support the use of viable alternative energy sources where appropriate.
- All new infrastructure with a life of 10+ years should consider climate change risks now for function, design and location.
- Reduce the impacts of climate change on the community's electricity infrastructure by:
  - recognising the importance of climate change on the community's electricity infrastructure;
  - avoiding quick decisions now that will make it more difficult to manage climate change risks in the future; and
  - building understanding and capacity of the community to deal with the impacts of climate change on the community's electricity infrastructure.

6.4.2 Overview of Current Situation

Electricity is supplied to Ugar from a central power station located in the town area towards the north western residential section. The generation, distribution and supply of electricity is undertaken by Ergon Energy on behalf of the State government.

Electricity is generated through multiple diesel generator sets (gensets), which are sized to match the load as it fluctuates during the day. The gensets are modular and interchangeable and as such, are relatively easy to repair or relocate without disturbance to the continuity of electricity supply.

The cost to generate electricity on remote islands is significantly higher than the income received from the consumers, between a factor of 5 – 10. The State Government Community Service Obligation, as an equalised tariff, covers the difference in generation costs and income.

Although the cost of electricity to consumers at Ugar is the same as for anywhere in Queensland, there is a pressing need for the all people on the island to conserve electricity. Electricity generated by the combustion of diesel fuel causes significant greenhouse gas emissions and the burning of fossil fuels, is not a sustainable practice.

Map 15 shows the areas serviced by the existing electricity infrastructure.

Map 15 Electricity Infrastructure

For more detail, refer to Map No. 9964-1417 contained in Maps.

6.4.3 Issues Overview

There is limited opportunity for viable alternative sources of energy on remote islands. It may be feasible to use gas to fire the gensets, as gas is a lower emitter of Greenhouse gas, however it is impractical and expensive to barge in large gas bottles for power generation.

Renewable energy sources such as wind and solar could be considered as a supplement to the base power supply. However, any renewable resource would not be able to completely replace the existing base diesel generator sets as, the demand on the island is too high for a renewable supply to support and there is no realistic method of storing generated electricity during periods of low generation (lack of wind or solar radiation).

From a land use perspective, gradual increase in population and the corresponding increase in demand is generally met by the inherited scalability in the system, i.e. the modular gensets can be reshuffled to suit. Large-scale increases in demand might require the upgrade of a switching and distribution infrastructure. Any new development away from the main powerlines may require a contribution to Ergon for the installation of powerlines/transformers etc, however this is generally considered on a case-by-case basis.

Any significant increase in generation capacity may require consideration of enlarging the power station site or relocating the site, although the existing site is relatively large. If a new site is required, an analysis of potential noise levels should be undertaken to avoid background diesel generator noise pollution in residential areas.

6.4.4 Land Use Strategies

To ensure the effectiveness and efficiency of the electric infrastructure network, the following strategies are recommended:

- Development should not occur in areas in close proximity to the generators.
- If development occurs adjacent or nearby to the generators, noise retention measures must be incorporated in the design of the development.
- Development must not impede the supply and access to the electric infrastructure network.
- The visual impact of electricity infrastructure on development and the natural environment is to be minimised through the provision of landscaping.
- Inappropriate land uses such as a school or a play area should not be located in an electricity easement or within close proximity of the generators.

6.4.5 Land Use Considerations

In assessing the impacts of future development on Ugar, the following key questions are to be raised. If the answer to any of the questions is 'NO', the proposal must, a) justify the inconsistency, b) be amended, or c) not be accepted.

- Is the development in accordance with the Electricity Best Practice, Land Use Strategies and Sustainable Outcomes?
- Can the existing electric infrastructure cater for the development without requiring an upgrade of the system?
- If the development is adjacent to or near a generator, does it include noise attenuation measures?
- If the development is for a new system or an enlargement of the existing infrastructure, have noise and landscape studies being undertaken?
- Has an agreement with Ergon regarding the supply of electricity been reached?

6.4.6 Sustainable Electricity Infrastructure Outcomes

- An efficient, sustainable and reliable electricity infrastructure.
- Energy efficient principles are included in the design and layout of new urban areas and developments.
- The visual and noise impact of electricity infrastructure on the natural and man made environments is minimised through landscaping and appropriate noise attenuation measures.
- All electricity infrastructure is inspected regularly and maintained to ensure that they are in effective working order.

6.5 Telecommunication Infrastructure

6.5.1 Best Practice

- Telecommunication facilities are expensive to install and consideration must be given to the proximity of existing telecommunication infrastructure when planning future development.
- The land around a telecommunication facility or service should be integrated and maintained to protect the land and marine environments.
- Planning around a telecommunication facility or service should aim to achieve and maintain a high standard of environmental quality and minimise noise to adjacent residential areas.
- All new infrastructure or modification to existing infrastructure with a life of 10+ years should consider climate change risks now for function, design and location.
- Reduce the impacts of climate change on the community by:
  - recognising the importance of climate change on existing and future telecommunication facilities or services;
  - avoiding quick decisions now that will make it more difficult to manage climate change risks in the future; and
  - building understanding and capacity of the community to deal with the impacts of climate change on the Island s natural environments.

6.5.2 Overview of Current Situation

A Telstra Tower is located on a lease immediately behind the school teacher residence lease. There is mobile phone coverage over Ugar.

Map 16 shows the location of telecommunication infrastructure.

Map 16 Telstra Infrastructure

For more detail, refer to Map No. 9964-1418 contained in Maps.

6.5.3 Issues Overview

There are no known issues regarding telecommunications on Ugar.

It is sound land use planning practice to ensure that compatible development occurs near telecommunication infrastructure. Residential development should not be permitted near the Telstra Tower.

6.5.4 Land Use Strategies

The following strategy is recommended:

- The Telstra tower is protected from urban encroachment, including noise sensitive development and any other development that may impact on current or future operations.

6.5.5 Land Use Considerations

In assessing the impacts of future development on Ugar, the following key questions are to be raised. If the answer to any of the questions is 'NO', the proposal must, a) justify the inconsistency, b) be amended, or c) not be accepted.

- Is the development in accordance with the Telecommunication Best Practice, Land Use Strategies and Sustainable Outcomes?
- Does the development provide affordable access to reliable telecommunication services?

6.5.6 Sustainable Telecommunication Outcomes

All telecommunications infrastructure is inspected regularly and maintained to ensure that they are in effective working order.

6.6 Roads

6.6.1 Best Practice

- Roads are expensive to construct and maintain so consideration must be given to the proximity of existing roads when planning future development.
- Foster investment in road improvements to ensure a high standard of road and adjoining environments.
- Encourage the use of walking and cycling rather than the use of vehicles.
- All new infrastructure with a life of 10+ years should consider climate change risks now for function, design and location.
- Reduce the impacts of climate change on the community's road infrastructure by:
  - recognising the importance of climate change on the existing and future road infrastructure on the community;
  - avoiding quick decisions now that will make it more difficult to manage climate change risks in the future; and
  - building understanding and capacity of the community to deal with the impacts of climate change on the community's road infrastructure.

6.6.2 Overview of Current Situation

The majority of roads on the developed eastern end of Ugar have recently been sealed with pavers or concrete (concrete access road to the barge landing). The sealed roads can generally be trafficked in all weather. There are no defined stormwater drainage systems on the island apart from minor culvert and above ground crossing of some roads, however stormwater drainage is not considered a major issue due to the natural topography.

The roads connecting the western infrastructure including the helipad, water lagoon and bores, the waste tip and the Ergon compound, are not sealed. These tracks are generally compacted soil and are reasonably trafficable in wet weather and as such, are not considered high priority for sealing.

6.6.3 Issues Overview

Ugar has recently received a major internal road upgrade through the provision of concrete pavers throughout the town area. As a result, dust and water ponding have effectively been eliminated.

The access road to the helipad should be considered for future sealing.

The road to the southern beach (which also services a single house on the beach) is severely eroded.

6.6.4 Land Use Strategies

To minimise existing and future development on the natural environment of Ugar and the impacts of natural hazards, the following strategies are recommended to be implemented:

- All development proposals must include landscaping and/or revegetation plans that are in accordance with the Best Practice, Land Use Strategies and Sustainable Outcomes outlined in this Plan.
- Transport planning considers the risk of natural hazards such as cyclones, tides, storm surges and acid sulfate soils with transport infrastructure located and designed to avoid or minimize the impact of such events.
- A network of functional, legible and convenient street signs is established.
- A safe and convenient network for pedestrians is provided along street networks, linking residences and providing access to points of attraction within and beyond the urban areas.
- Parking areas do not affect the unique characteristics of sites and are linked to more sensitive features of each site with safe pedestrian and cycle ways.
- Encourage alternative forms of transportation around the community such as bicycle, scooter to reduce the reliance on petrol driven vehicles. This would also improve the problem of disused and abandoned vehicles consuming valuable space in the dump.

6.6.5 Land Use Considerations

In assessing the impacts of future development on Ugar, the following key questions are to be raised. If the answer to any of the questions is 'NO', the proposal must, a) justify the inconsistency, b) be amended, or c) not be accepted.

- Is the development in accordance with the Roads Best Practice, Land Use Strategies and Sustainable Outcomes of this land use plan?
- Does the development integrate the land use, efficient movement of people and goods and growth for Ugar?
- If the development is in a natural hazard area or adjacent to the northern and southern coastline, is the road located and designed to avoid or minimize the impact of such events?
- If a new street or road is proposed,
  - does it provide for vehicles, pedestrians and cyclists adequately
  - is it highly connected within the development, with the surrounding area and between settlements
  - does it propose road signage in keeping with Ugar's signage network?

6.6.6 Sustainable Road Infrastructure Outcomes

- The integration of land use and an efficient, safe and sustainable road network that minimises adverse impacts on the environment and reflects the needs of the community.
- Development encourages lower impact modes of travel such as walking and cycling
- All vehicles bought onto the community are to be removed from the island after construction is completed.
- All road infrastructure is inspected regularly and maintained to ensure that is it in effective working order.

6.7 Drainage

6.7.1 Best Practice

- Protect drainage infrastructure and receiving waters from sedimentation and other contaminants.
- Ensure that streets operate adequately during major storm events and provide for public safety and minimise the drainage infrastructure cost of development.
- All new infrastructure with a life of 10+ years should consider climate change risks now for function, design and location.
- Manage quality and quantity of urban runoff by using stormwater in the landscape by incorporating multiple-use corridors that maximise the visual and recreational amenity of the community.
  - Reduce the impacts of climate change the community's drainage system and infrastructure by:
  - recognising the importance of climate change on the community's drainage system and infrastructure;
  - avoiding quick decisions now that will make it more difficult to manage climate change risks in the future; and
  - building understanding and capacity of the community to deal with the impacts of climate change on the community's drainage system and infrastructure.

6.7.2 Overview of Current Situation

The township is located on elevated land with sloping ground to the surrounding beaches. As such, stormwater generally disperses freely without flooding. There are no defined stormwater pipe systems on the island. Some of the roadways have culvert crossings, which discharge into natural watercourses.

6.7.3 Issues Overview

The council is appreciative of the new concrete paving around the township area which has reduced dust and water ponding. These new roads should continue to be appropriately maintained in order to prevent dust and water ponding problems reoccurring in the future.

6.7.4 Land Use Strategies

The following strategy is recommended:

- That development is not permitted in overland flow paths or drainage paths

6.7.5 Land Use Considerations

In assessing the impacts of future development on Ugar, the following key questions are to be raised. If the answer to any of the questions is 'NO', the proposal must, a) justify the inconsistency, b) be amended, or c) not be accepted.

- Is the development in accordance with the Drainage Best Practice, Land Use Strategies and Sustainable Outcomes?
- Is the development designed to minimise its impact on the existing drainage network. Down stream catchment and adjoining properties?

6.7.6 Sustainable Drainage Infrastructure Outcomes

- Minimise damage to properties and inconvenience to residents from urban runoff by integrating stormwater treatment into the landscape.
- All drainage infrastructure is inspected regularly and maintained to ensure that it is in effective working order.

6.8 Air Access

6.8.1 Best Practice

- Efficient air transport to service both freight and passenger needs is provided.
- Freight and passenger air access is integrated and maintained to protect the adjoining natural and man made environments.
- Adjoining land uses and development are compatible with the operation of airstrip with houses shielded from the impact of aircraft noise by requiring appropriate noise attenuation measures.
- All new infrastructure or modification to existing infrastructure with a life of 10+ years should consider climate change risks i now for function, design and location.
- Reduce the impacts of climate change and fuel costs on air access to and from the community by:
  - recognising the importance of climate change and fuel costs on air access to and from the community;
  - avoiding quick decisions now that will make it more difficult to manage climate change risks in the future; and
  - building understanding and capacity of the community to deal with the impacts of climate change and fuel costs on air access.

6.8.2 Overview of Current Situation

Due to it's small size Ugar does not have an airstrip for fixed wing aircraft. Air access to the island is via helicopter only and a helipad has been constructed near the western end of the island.

Emergency access is available via medivac rescue helicopter (day and night) if required.

Stephen Island suffers because it does not have an airfield. It makes access to the community difficult, expensive and sometimes dangerous (eg, by dinghy via Darnley Island).

There is only one potential location for a practical airstrip on Stephen Island.

Some years ago a strip along the west coast was cleared for an airstrip before it was realised it would be too short to be suitable and was not on the correct alignment of the prevailing winds. Although a strip running almost north-south through the middle of the island was earmarked for a future airstrip, the construction of an airfield would require substantial clearing on the southern half and earthworks to level out a height range of up to 8 m.

The traditional owners advised in 2009 that plans for an airstrip have been abandoned in favour of preserving the environmental quality of Ugar.

6.8.3 Issues Overview

Lighting of the airstrip would assist in night time emergency or bad weather access to the island, although it may be cost prohibitive and contribute to increase in energy consumption of the island.

Land surrounding the helipad represents a sensitive and valuable resource. It is critical that the land use planning process considers the implications of incompatible land uses on the operations of the airstrip and associated facilities.

6.8.4 Land Use Strategies

The following strategy is recommended:

- The helipad is protected from urban encroachment, including noise sensitive development and any other development that may impact on current or future operations.

6.8.5 Land Use Projects

Studies that are undertaken to determine the suitability of the investigation area for development must address the impact of the airstrip and measures required to be implemented to ease these impacts.

6.8.6 Land Use Considerations

In assessing the impacts of future development on Ugar, the following key questions are to be raised. If the answer to any of the questions is 'NO', the proposal must, a) justify the inconsistency, b) be amended, or c) not be accepted.

- Is the development in accordance with the Air Access Best Practice, Land Use Strategies and Sustainable Outcomes?
- If the development is located near or adjacent to the airstrip is it:
  - a compatible land use with the airstrip; and
  - if so, does it incorporate noise attenuation measures?
- Does the development impact on the approach/take-off areas of the runway?

6.8.7 Sustainable Air Infrastructure Outcomes

- Recognise the importance of the helipad to the community and the Torres Strait Islands.
- The integration of land use and air access purposes to ensure that there is minimal adverse impact on the development.
- All air infrastructure is inspected regularly and maintained to ensure that it is in effective working order.

6.9 Sea Access

6.9.1 Best Practice

- Planning around a barge ramp and jetty should aim:
  - to achieve and maintain a high standard of environmental quality;
  - minimise noise to adjacent village areas;
  - to protect land around a barge ramp and jetty to preserve their value for uses which depend upon proximity to the sea for access to services and facilities; and
  - to integrated and maintained sea access infrastructure to protect the land and marine environments.
- Provide efficient sea transport to service both freight and passenger needs.
- All new infrastructure or modification to existing infrastructure with a life of 10+ years should consider climate change risks now for function, design and location.
- Reduce the impacts of climate change and fuel costs on sea access to and from the community by:
  - recognising the importance of climate change and fuel costs on sea access to and from the community;
  - avoiding quick decisions now that will make it more difficult to manage climate change risks in the future; and
  - building understanding and capacity of the community to deal with the impacts of climate change and fuel costs on sea access.

6.9.2 Overview of Current Situation

The marine facilities at Ugar consist of a concrete barge ramp located on the northern side of the island and a floating pier adjacent to the ramp. A berthing/swing basin has been dredged at the ramp however a channel has not been dredged through the reef, which extends another 600m from the shore. Consequently, barges can only cross the reef at very high tides.

On low tides, critical cargo often has to be unloaded onto punts to cross the reef and in some cases, barges have had to cancel offloading completely.

The floating pier is currently unserviceable and the floating platforms have been stored on shore.

Ugar is serviced fortnightly by a barge service from Port Kennedy, however deliveries can be missed if the tides are not suitable.

This severely impacts on the community, such as fuel delivery for electricity generation plant for the island, as well as normal vehicle useage. As there is no shop on Ugar, food and essential item deliveries need to be planned well in advance.

Issues Overview

The floating pier is a narrow aluminium structure attached to sliders on timber piles. The structure is suitable for the mooring of small vessels, however it is currently not in use. There are plans for upgrade of the mooring dophins and floating pontoon in early 2010.

A barge channel through the reef needs to be dredged to enable barge access at all times.

Currently, if the tides are too low and the conditions too dangerous to unload at sea to a punt, the barge will abort unloading and the community will not receive its supplies until the next scheduled visit.

The barge ramp provides access for all goods transported to the island and is an essential part of the community's infrastructure.

6.9.3 Land Use Strategies

The following strategy is recommended:

- Land use and barge ramp purposes are to be integrated to ensure that development is compatible with adjacent village development.

6.9.4 Land Use Considerations

In assessing the impacts of future development on Ugar, the following key questions are to be raised. If the answer to any of the questions is 'NO', the proposal must, a) justify the inconsistency, b) be amended, or c) not be accepted.

- Is the development in accordance with the Sea Access Best Practice, Land Use Strategies and Sustainable Outcomes?
- Does the development provide efficient access to the barge ramp and jetty?
- If the development is located near or adjacent to the barge ramp and the desalination plant is it a compatible land use for port activities?

6.9.5 Sustainable Sea Access Outcomes

- Recognise the importance of sea access to the community and the Torres Strait Islands.
- Develop and implement an integrated management plan for land uses around the barge ramp and jetty.
- All sea infrastructure on or abutting the community is inspected regularly and maintained to ensure that they are in effective working order.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