Redland Shire Council
Queensland Department of Local Government and Planning

Southern Moreton Bay Islands Planning Strategy

Planning Report

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1. Introduction

The Southern Moreton Bay Islands Planning and Land Use Strategy was commissioned by Redland Shire Council, the Queensland Department of Local Government and Planning, and the Queensland Department of Environment in August 1996. The strategy has been prepared as a framework for the future development and conservation of Russell, Lamb, Macleay, Perulpa and Karragarra Islands, which are collectively known as the Southern Moreton Bay Islands.

This Planning Study presents the key findings from a range of technical and scientific studies carried out as input to the development of the strategy. The outcomes of the extensive consultation process conducted throughout the study period are also presented in this document together with a synthesis of the implications of all investigations for strategy development.

Copies of the studies which formed the basis of this document are contained in two technical supporting volumes.

These are "Southern Moreton Bay Islands Land Use Strategy Technical Papers", Volume 1 (Ecological Investigations) and Volume 2 (Infrastructure and Social Investigations).

1.1 Project Objectives

The overall objective of the project, as set out in the Project Brief, is to prepare a planning and land use strategy that:

- Recognises that subdivision of the Islands has produced approximately 19,000 largely unserviced allotments, many of which are smaller than 600m^2 in area;
- Provides an ecologically sustainable population level for the Islands and an ecologically, socially and economically sustainable approach to any future development;
- Provides a comprehensive framework for planning and managing development of the Islands within the context of the surrounding region;
- Outlines a strategy for development of the area in a manner sympathetic with the preservation, protection and enhancement of the natural environment, landscape character and heritage values;
- Promotes the scenic and visual quality of the area and protects its ecological values;
- Provides a sound information base and management strategy for the programming, costing and funding of social and physical infrastructure in a coordinated and timely manner;

- Provides a management strategy to address the issue of drainage problem land and the existing subdivision patterns;
- Creates a flexible strategy that will cater for the current and future needs of the Island's communities; and
- Promotes the creation of an urban structure which uses land in an efficient and sustainable way and provides an acceptable level of accessibility to retail and commercial facilities, open space, recreational opportunities and community facilities.

1.2 Background

The pattern and intensity of development on the Southern Moreton Bay Islands is a longstanding regional land use problem. The Southern Moreton Bay Islands present a range of unique planning problems which result from the presence of approximately 19,000 largely unserviced allotments, many of which are smaller than $600m^2$ in area and about 5,700 of which have been identified as possessing some form of drainage constraint.

Development to the existing capacity of the current subdivision on the Islands may lead to levels of development that are not ecologically sustainable.

Population growth on the Bay Islands raises concerns related to the adequacy of the existing and likely future extent of urban service/facility provision, and the potential adverse environmental impacts associated with significant increases in permanent and visitor populations on the Islands.

Defining a theoretical sustainable population level based on indicators of environmental capacity (such as terrestrial flora retention, water quality marine fauna), is inherently problematic as technology, infrastructure and policy changes can alter the relationship between the number of residents and the state of the environment. However, the current state of these indicators reflects existing stresses on the environment and those elements of the natural environment most at risk from the impacts of development. These include the wetlands systems and the intertidal and marine ecosystems. Awareness of the existing stresses and those environmental elements most at risk enables appropriate areas for, and levels of, development to be determined.

Planning Context

The Moreton Bay Strategic Plan, which was endorsed by the Queensland Government in 1993, highlights the need for action in relation to planning for the future development of the Bay Islands. The goal of the Moreton Bay Plan is "to provide for ecologically sustainable use of Moreton Bay and to protect its natural, recreational, cultural heritage and amenity values". The Plan proposes habitat protection, low density, low impact residential development for the islands (the island village concept), and foreshadows the need for revised subdivision by-laws and continued restriction on building in drainage problem areas in order to restrict further development.

The Moreton Bay Strategic Plan is complemented at a broader regional level by the *SEQ 2001 Regional Framework for Growth Management* (RFGM), which provides a policy and planning framework guiding growth in south-east Queensland. The RFGM recognises the importance of protecting Moreton Bay as an environmental asset, proposes that acceptable levels of environmental change to Moreton Bay and its islands are not exceeded, and that an ecologically sustainable population level for the Bay Islands be determined. The Bay and its islands also form part of an important regional open space network.

This strong environmental awareness was also evident in the *Vision 2005 Study* undertaken by the Redland Shire Council in 1995. The study indicated that the local community agreed that future development on the Bay Islands should protect their unique environmental characteristics, achieving a balance between environmental, infrastructure and service needs.

2. The Natural Environment

This section provides a summary of the main findings of the investigations into the ecological attributes of the Islands. Complete details are contained in Technical Papers - Volume 1, Ecological Issues.

2.1 Terrestrial Flora

Key findings from the assessment of the terrestrial flora on the Islands, undertaken by Dr Mike Olsen (LAMR Pty Ltd) are detailed below. The vegetation categories are depicted in Figures 1(a) and (b).

- The studies of terrestrial flora have identified two species listed under the *Nature Conservation Act* and nine other important vegetation groups. The largest significant areas exist on Russell Island.
- The loss of eucalypt forest habitat on Macleay, Lamb and Karragarra Islands has progressed to such a degree that what remains needs to be protected or carefully managed to sustain the diversity of forest fauna. Larger tracts of forest remain on Russell Island but are being fragmented by housing or are suffering from weed infestation or excessive burning. These forests are at risk of losing the diversity of structure that would sustain a diverse bird fauna.
- A number of the vegetation types on the Islands have been recorded as bioregional ecosystems of conservation significance, and have been recognised as "rare" or "threatened". These include:
  - littoral rainforest areas,
  - successional communities within large remnant forest areas,
  - heathlands,
  - tea tree *(Melaleuca quinquenervia)* wetlands with heathland or sedgeland understorey,
  - blackbutt (*Eucalyptus pilularis*) remnants in a viable state, and
  - foreshore vegetation, particularly the relatively weed free areas and those harbouring rainforest elements.
- Two further species found (a species of orchids and a type of lily) are classified under the *Nature Conservation (Wildlife) Regulation 1994*.
- Clearing for development and fuel burns to control bushfire risk are the greatest threats to terrestrial flora.

2.2 Terrestrial Fauna

An assessment of the terrestrial fauna on the Islands was carried out by Dr Peter Driscoll and David Stewart between October 1996 and February 1997. It was found that the Islands support a diverse range of fauna including 28 species which are of significance at the State, National or International level. Four species recorded on the Islands are listed as "rare" (False Water Rat, Chestnut Teal, Eastern Curlew and the Burrowing Skink) and six are listed as "vulnerable" (Dugong, Little Tern, Glossy Black Cockatoo, Green Turtle, Flatback Turtle and Wallum Froglet) by the Queensland Department of Environment.

Important fauna habitat areas include the following:

- the low lying forest west of the farm in the south west of Macleay Island,
- the mixed eucalypt forest in the south west of Russell Island,
- the foreshore areas, supra tidal flats and mangrove areas,
- the melaleuca wetlands and wet heath land areas,
- the false water rat habitat in the vicinity of Brown's Bay (which requires absolute protection of the sedge nesting and refuge zones as well as the adjoining mangrove feeding areas), and
- the whistling kite aggregation site.

The glossy black cockatoo habitats on Macleay Island (and possibly Lamb Island) need protection through:

- identification and protection of nest trees and hollow trees which offer potential for breeding; and
- protection and rehabilitation of casuarinas with or without mixed eucalypt associations.

2.3 Marine Flora and Fauna

Assessments of the marine environment carried out by FRC Consultants between October 1996 and February 1997 revealed the following:

- The mangroves and saltmarshes on the Southern Moreton Bay Islands are a substantial proportion of the mangroves and saltmarshes in Redland Shire, and have local and regional ecological significance.
- There are extensive seagrass beds around the three northern Islands (Macleay, Lamb and Karragarra) and the northern end of Russell Island. These seagrass areas play a critical role in coastal marine ecosystems providing habitat for commercial prawn species together with juvenile and adult fish. Seagrass also provides the sole food source for dugong and green turtles.

- Development in the catchment of Moreton Bay has led to a decrease in seagrass area, particularly around Russell Island. The southern part of Moreton Bay is particularly effected by discharges from the Logan River, water quality of which is in turn affected by urban development and other land uses in the catchment. The Southern Moreton Bay Islands area is likely to be most significant as habitat for the juveniles of important species such as bream, flathead, mullet and whiting and possibly a spawning ground for garfish and herring. It also contains habitat that supports a number of species of endangered marine mammals and reptiles, in particular the green turtle, loggerhead and hawkesbill turtles, dugong and the Indo-Pacific humpback dolphin.

- The cumulative affect on increasing development on the Bay Islands has potential to impact on the intertidal and marine communities from:
  - increased nutrient loads leading to a reduction in water clarity and seagrass depth distribution particularly in marine areas with poor tidal flushing;
  - increased turbidity with resultant impacts on the distribution of both seagrasses and algae, (turbidity associated with the plume of the Logan River has been linked to the disappearance of some seagrass beds in the Bay Islands area);
  - altered salinity levels in mangrove and saltmarsh areas; and
  - acidification of waterways from disturbance of intertidal and marine sediments and exposure of acid sulphate soils.

- Any degradation of aquatic habitat will ultimately impact upon the dugong, dolphin and turtles within the Bay Islands area. Also, increasing boat traffic associated with development or a general increase in recreational boating could lead to an increase in boat strikes on dugong and turtles.

Areas of ecological significance are also shown on Figures 1 and 2.

2.4 Conservation Priorities

Based on the assimilation of the findings from the above investigations, four levels of conservation priority have been allocated across the Islands:

- ***Very High Priority*** - areas which should be protected from development (eg. through purchasing/using funds from Council's environmental levy and/or regulation).

- ***High Priority*** - areas where conservation would be highly desirable.

- ***Moderate Priority*** - areas for which stringent controls on development would be desirable to reduce loss of vegetation.

- ***Low Priority*** - areas for which vegetation retention within the built environment would be desirable.

Land outside these conservation priority areas is not considered to have significant ecological value however may have remnant or regrowth vegetation which contributes to the overall amenity of the Islands.

Table 2.1 below shows the area of each Island within each of the priority conservation areas.

Figures 2(a) and 2(b) depict the conservation priority areas across each of the Islands.

Table 2.1
Conservation Priority by Island

Island	Very High	High	Moderate	Low	Total
Russell	16.8%	6.2%	14.9%	13.4%	51.3%
Macleay	9.7%	-	7.7%	21.4%	38.9%
Lamb	2.7%	3.2%	7.7%	8.0%	21.6%
Karragarra	0.8%	5.2%	13.8%	6.7%	26.6%

All intertidal areas have also been rated as very high conservation areas.

2.5 Ecological Capacity

The definition of ecological sustainability as provided by the new Integrated Planning Act is:

"….. a balance that integrates:

(a) protection of ecological processes and natural systems at local, regional, State and wider levels, and

(b) economic development; and

(c) maintenance of the cultural, economic, physical and social wellbeing of people and communities".

That change will occur on the Islands as a result of development is inevitable. What is important is that this change be managed to ensure that an appropriate balance is achieved between the three components of ecological sustainability as described above.

In relation to the natural environment this means development should not exceed the ecological capacity of natural systems. In its simplest form, the ecological capacity can be defined as:

> *'The capacity of the Islands' ecosystems to sustain change caused directly or indirectly by human activities"*

The purpose of the ecological capacity is to provide environmental indicators, so that all the stakeholders have a common base on which to develop ecologically sustainable strategies for the Islands.

As mentioned earlier, defining a theoretical population capacity based on these indicators, is inherently problematic as technology, infrastructure and policy changes can alter the relationship between number of residents and state of the environment.

The important thing is for stakeholders to understand the implications of the various strategy options in ecological terms.

Table 2.2 summarises the state of the ecosystem components and main pressures on each component.

Table 2.3 shows the individual components of these systems and measures of state indicators and ecological capacity.

Table 2.2
Summary of the State and Pressures Applying to the Major Flora and Fauna Systems of the Islands

Ecosystem or Component	State	Main Pressures
Terrestrial flora	Generally degraded from pre-European condition; Some high quality remnants and two NCA listed species; Mixed Eucalypt associations dominant.	- clearing - fire - weeds - nutrient pollution
Terrestrial fauna	General decline from pre-European condition; Birds are the most diverse group; One NCA listed species.	- clearing - fire - introduced fauna
Freshwater flora	Generally degraded from pre-European condition; Some high quality remnants; Melaleuca and sedges dominant.	- drainage and filling - clearing - fire - nutrient & sediment pollution - introduced fauna
Freshwater fauna	General decline since settlement - largely due to habitat loss; Two NCA listed species.	- drainage, filling & clearing - introduced fauna - nutrients & sediments - weeds
Intertidal and Marine flora	Mangroves dominant and relatively intact; Saltmarshes generally intact; Seagrasses have locally declined since 1989; Rocky reef and coral locally significant.	- clearing and filling (mangrove & saltmarsh) - nutrient and sediment pollution (seagrass) - sediments (rocky reef/coral) - insect control (mangroves) - weeds (saltmarsh) - vehicle use (saltmarsh)
Intertidal and Marine fauna	Sediment fauna, birds and fish dominant; Generally sustainable, but some species have declined; Four IUCN and five NCA listed species; additional 16 species listed under CAMBA and/or JAMBA.	- clearing and filling - introduced species - insect control - nutrient & sediment pollution - boat traffic & fishing

The column in Table 2.3 which rates ecological capacity shows the least ticks for those ecosystems or components which have the least capacity to sustain further human pressures. The three 'state indicator' columns provide broad indicators of the condition of each ecosystem and have been used to guide the rating on ecological capacity. ***However, ultimately the ecological capacity is a judgement by each scientific specialist in the GHD team and some of that***

judgement is necessarily subjective because there is insufficient data and research on cause-and-effect.

The ecosystems/components which have the lowest ecological capacity are:

- heathlands (three remnant communities only)
- terrestrial and freshwater mammals (available habitat under pressure)
- amphibians (habitat modification and pollution)
- invertebrates (habitat modification and pollution)
- Melaleuca wetlands (restricted areas and susceptible to modification through fire clearing and drainage)
- sedgelands (restricted area and susceptible to drainage changes)
- saltmarshes (only a few remnants remain)
- seagrasses (decline in occurrence around Russell Island)
- dugongs (decline in extent of local seagrass)
- turtles (decline in extent of local seagrass).

Table 2.3
Summary of State Indicators, Ecological Capacity and Pressures on Flora and Fauna Sub-Systems

Ecosystem or component	State indicator			Ecological capacity	Impacting Factors
	Health	**Extent**	**Diversity**		
Terrestrial flora					
- Eucalypt communities	✔✔	✔✔	✔✔	✔✔	Clearing, weeds, fire, nutrients
- heathlands	✔✔	✔	✔✔	✔	Clearing, nutrients, sediments, drainage
Terrestrial & freshwater fauna					
- reptiles	✔✔	✔✔	✔✔	✔✔	Clearing, introduced fauna
- mammals	✔✔	✔✔	✔✔	✔	Clearing, weeds, fire, nutrients
- birds	✔✔	✔✔	✔✔	✔✔	Clearing, weeds, fire
- fish	✔	✔	✔	✔	Toxins, drainage, nutrients, introduced fauna, weeds
- amphibians	✔✔	✔	✔✔	✔	Introduced fauna, nutrients, sediments, drainage
- invertebrates	✔✔	✔	✔	✔	Toxins, drainage, nutrients, introduced fauna
Freshwater flora					
- Melaleuca communities	✔✔	✔✔	✔✔	✔	Clearing, nutrients, fire
- sedgelands	✔✔✔	✔	✔	✔	Fire, nutrients, sediments, drainage
Intertidal and Marine flora					
- mangroves	✔✔✔	✔✔✔	✔✔✔	✔✔✔	Clearing, nutrients, sediments
- saltmarshes	✔✔	✔✔	✔✔✔	✔	Clearing, nutrients, sediments
- seagrasses	✔	✔	✔✔	✔	Nutrients, sediments, dredging, filling
- macroalgae	ID	ID	ID	✔✔	Clearing, nutrients, sediments
Intertidal and Marine fauna					
- benthic fauna (sediment)	✔✔	✔✔	✔✔	✔✔	Nutrients, sediments, dredging, filling
- benthic fauna (rock/coral)	✔✔	✔✔	✔✔	✔✔	Nutrients, sediments, dredging, filling
- dugongs	✔✔	✔	N/A	✔	Nutrients, toxins, sediments, dredging, filling, boat strike
- turtles	✔	✔✔	✔✔	✔	Nutrients, toxins, sediments, dredging, filling, boat strike
- fish and invertebrates	✔✔	✔✔	✔✔	✔✔	Nutrients, toxins, sediments, dredging, filling
- waders and water birds	✔✔	✔✔✔	✔✔	✔✔	Nutrients, toxins, sediments, filling, fishing/boating, human disturbance.

Capacity to sustain further human pressures:

✔ - Low ✔✔ - Moderate ✔✔✔ - High
ID - insufficient data N/A - not applicable

Terminology

1. ***Health*** *- quality of the community/population as a consequence of stresses from external factors such as disease, weeds, pests and fire, relative to unstressed communities/populations.*
2. ***Extent*** *- area (flora) or habitat/population size (fauna) relative to pre-European distribution.*
3. ***Diversity*** *- Number of endemic species relative to sub-regional species numbers.*
4. ***Ecological Capacity*** *- sustainability of the local community/population in the long term under current environmental conditions and pressures.*
5. ***Impacting Factors*** *- those stresses, pressures or factors which threaten the continuance of the ecosystem or component thereof.*

These impacting factors will be used as one set of inputs to the formulation of scenario evaluation criteria. Each scenario will then be assessed in terms of the extent it responds to or addresses these impacting factors.

2.6 Mosquitoes and Biting Midges

The key findings arising from investigations by FRC Consultants into the breeding areas of mosquitoes and midges and implications for settlement on the Islands include the following:

- The Islands are characterised by bushland, freshwater, and coastal (estuarine) wetlands which provide significant breeding sites for both mosquitoes and biting midges .
- The salt marsh mosquito, together with two other common species of mosquito that breed in brackish waters, has been widely implicated in the transmission of the debilitating disease Ross River virus.
- Three species of biting midge have been reported as breeding in the coastal habitats of Redland Shire, although none are currently considered a vector of human disease.
- Development of the Bay Islands should be undertaken recognising the presence and proximity of mosquito and biting midge breeding sites. Land use controls such as buffers around breeding sites, are unlikely to significantly reduce mosquito problems and associated risk from Ross River fever. Provision of cleared buffers may reduce midge distribution.
- In conjunction with Council's ongoing program of treating known breeding areas, public education of the risk of mosquitos and midges on the Islands and the encouragement of appropriate building controls will remain the most effective means of minimising mosquito and midge nuisance. Community involvement in monitoring breeding areas will also be important strategies.

2.7 Landscape

The varied landscape features and physical settings of the Southern Moreton Bay Islands are among the primary factors attracting residents, tourism and development to the Islands. The important landscape features contributing to visual and scenic quality of the Islands need to be protected to ensure they are not degraded over time by development pressure and that the very reason for their attraction is not lost.

The Islands still retain significant natural, recreational, cultural heritage and amenity values. These contribute to the Islands' unique appeal.

Visual Landscape

A visual landscape assessment of the Islands was carried out by Gillespies Asia Pacific, the principal findings of which are discussed below.

Key determinants of the visual amenity of the Bay Islands relate to landform, landcover and the interaction of vistas to the mainland, Moreton Bay, Stradbroke Island and narrow passages between the Islands as well as vistas from on the water to the Islands.

Significant visual landscape features include:

- The southern section of Macleay and Lamb Islands combines with northern Karragarra Island to focus on the unique passage from Pinipinin Point to Burns Point, complemented by the water craft activity in this passage.
- Northern Russell Island tends to be influenced by the tidal mangroves of Karragarra Island and Long Island as well as view sheds internally. At the western end towards Canaipa Point, Lamb Island and Krimmel Passage influence view sheds.
- The south western section of Russell Island which contains turtle and tea tree swamps, Browns Bay, Giants Grave and extensive mangrove flats is a unique area in its own right containing extensively intact vegetated healthland, forest and mangrove communities. This area tends to have its own internal focus influenced by the main channel.
- The narrower hillier eastern section of Russell Island extending from Canaipa Point south to Oak Island with the striking backdrop of the seemingly mountainous North Stradbroke Island and exposed sand mining.

2.8 Landscape Units, Sensitivities and Values

The overlaying of the landcover, landform and visual influences throughout the Bay Islands produced a mappable image, where it is possible to identify a broad pattern of landscape units which share a number of common elements. These have been simplified into seven primary landscape units described below. Units assessed as having high and very high visual sensitivity are shown in Figures 3(a) and 3(b).

- *Tidal Wetland* - These areas by virtue of their relative intactness and importance to the environment and ecology of Moreton Bay and for their landscape significance as part of Bay Island's landscape character and scenic quality, are recommended for preservation and protection.
- *Drainage Valleys and Wetlands* - These mostly linear sections of varied landscape provide major opportunities to act as natural open space buffers or dividers between development enclaves. They act to divide Macleay and Russell Islands into precincts of higher land where development is tending to occur and in time may be the only significant areas of remnant vegetation left on the Islands except for the tidal mangrove flats.
- *Significant Hills and Promontories* - These areas tend to have been partially cleared and developed but are still visually prominent. They require controlled development to ensure remnant vegetation is not indiscriminately

cleared and that suburban housing does not dominate this landscape unit especially in key areas such as Canaipa Point, Kibbinkibbinwa Point, Southern Russell Island, Rocky Point, Perulpa Island, Potts Point, Pininpinin Point, Thompsons Point, Burnes Point and western Karragarra Island.

- *Undulating Settled Land* - These extensive areas are where development pressure has *and* will continue to occur. Controlled residential development can continue in these areas provided other landscape units are protected or managed with more control.

- *Significant Remnant Forest* - These are upland zones of land yet to be developed and it is recommended that development controls, including house design and siting guidelines, landscape protection and enhancement and streetscape construction guidelines be created as part of development conditions.

- *Existing Roads and Streets* - There is a unique landscape character associated with unconstructed gravel roads and streets, much in the rural landscape tradition. Consideration should be given to alternative standards of road construction to protect the character. Retention of roadside vegetation to enhance landscape character should be encouraged.

- *Escarpment Edges* - Cliff edges greater than 5 metres in height require special attention to ensure existing landowners and future development does not clear the steep vegetated Island edge. Already, there has been significant visual landscape impairment in many sections of the Islands, where the escarpment edges have been mass cleared to create clear vistas out to Moreton Bay and beyond.

The existing subdivision pattern of the Islands will complicate the achievement of acceptable levels of development in these areas of high visual sensitivity. Strategies will need to focus on those areas which also have high conservation priority, together with possible controls on building appearance and materials.

2.9 Drainage Investigations

Extensive hydrological modelling and on-site lot by lot assessment has been carried out by GHD's team members together with technical staff from Redland Shire Council.

The flood events likely to occur every two years and every 100 years were modelled and areas potentially subject to inundation identified. Generally there is a very close relationship between the possible inundation areas and allotments which have already been zoned Drainage Problem. However, there are over 500 additional allotments which are affected to some extent by overland flows. These have been divided into 10 categories based on the extent and nature of constraint to development on each lot. These categories are described below and shown on Figures 4(a) -4(g).

- **Drainage Easements Category 0 - Colour Coding on Maps (*Black Hatched*)**

  Where a section of an allotment is required for the conveyance of concentrated stormwater - generally following the route of natural drainage paths, the area of land which is required to convey the water for up to a Q100 flood event will have an easement for drainage purposes applied. These easements will prohibit the construction of works or any other such activities which may limit the conveyance of stormwater.

- **Drainage Problem Category 1 - Colour Coding on Maps *(Solid Dark Blue)***

  Allotments which generally have less than 450 square metres of land above the Q100 limits of inundation. Category DP1 also includes allotments which cannot be provided with access clear of Q2 inundation. These allotments are unlikely to receive building approval and have been identified for acquisition.

- **Drainage Problem Category 2 - Colour Coding on Maps *(Solid Green)***

  Allotments partially within the Q100 limits of inundation, but generally with more than 450 square metres of land above the Q100 flood level. Category DP2 may also include lots where access is affected by Q2 inundation. Development may be permissible with Council approval. Drainage easements or partial lot acquisitions within this category may be required.

- **Drainage Problem Category 3 - Colour Coding on Maps *(Cross Hatched in Red)***

  Allotments with an existing zoning of "Drainage Problem" as at November 1997 and which generally have less than 450 square metres of land above the Q100 limits of inundation. Category DP3 may also include allotments which cannot be provided with access above the Q2 inundation. These allotments have been identified for acquisition.

- **Drainage Problem Category 4 - Colour Coding on Maps *(Light Blue)***

  Allotments with an existing zoning of "Drainage Problem" as at November 1997. Some of these lots have existing dwellings or have been issued with building approvals. This category also includes lots which have been identified for recategorising. Apart from these latter types of lots, lots in this category are unlikely to receive building approval.

- **Drainage Problem Category 5 - Colour Coding on Maps *(Solid Brown)***

  Identified allotments which are required to provide access where existing access to allotments is restricted by Q2 inundation or the access is below RL 2.4 AHD. Allotments or partial lots within this classification have been identified for acquisition.

- **Drainage Problem Category 6 - Colour Coding on Maps *(Blue Hatch)***

  Allotments which generally have, according to topographic data, less than 450 square metres of land above RL 2.4 AHD. This may include allotments which cannot be provided with access above RL 2.4 AHD. These allotments are unlikely to receive Building Approval unless it can be demonstrated that sufficient land is available for the proposed development and its servicing requirements. In certain circumstances consideration may be given for minor filling for a building platform and any septic sullage disposal areas on land below RL 2.4. Factors which would be considered in determining such a proposal would include, but not be limited to, impact on existing vegetation and coastal ecosystems, nuisance/damage to adjoining lots, impacts on visual amenity and effects on natural drainage and stormwater flows.

- **Drainage Problem Category 7 - Colour Coding on Maps *(Green Hatch)***

  Allotments which have more than 450 square metres of useable land above RL 2.4. Development may be permissible with Council consent.

- **Drainage Problem Category 8 - Colour Coding on Maps *(Green Cross Hatched)***

  Allotments which are required to accommodate the diversion of excess stormwater flows, once the capacity of the road system has been exceeded. These allotments have been identified for acquisition.

- **Access Problem Grade (APG) Category 9 - Colour Coding on Maps *(Solid Yellow)***

  Allotments which do not have access via existing road systems due to excess vertical alignments. Development may be permissible with Council consent, subject to alternative access being arranged.

Notes:

(i) Where classifications are based on levels or flood inundation lines, land owners may have the option to arrange their own technical assessments in accordance with Council's design guidelines for the area.

(ii) Where allotments have been indicated as being affected by tidal water, property owners will have the opportunity to arrange independent authorised surveying of their allotments to validate the ground levels.

(iii) Where allotments have been identified as DP6 - ie having less than 450 metres of land above 2.4 AHD, consideration may be given to filling subject to compliance with drainage, access, environmental etc. requirements.

In summary Table 2.4 below details the number of blocks in each drainage problem category.

Table 2.4
Drainage Problem Categories
(No. of Lots/Island)

Island	Drainage Problem Categories										Total
	0	1	2	3	4	5	6	7	8	9	
Macleay	28	163	152	57	270	0	58	195	4	10	909
Lamb	4	11	24	20	67	0	2	13	0	0	137
Karragarra	2	1	0	1	3	0	15	43	0	0	63
Russell	41	327	292	177	3449	2	126	162	8	23	4566
Grand Total	**75**	**502**	**468**	**255**	**3789**	**2**	**201**	**413**	**12**	**33**	**5675**

Reference should also be made to Technical Papers - Volume 1 (Ecological Investigations) which provide full details of drainage investigations.

3. Infrastructure and Transport

This section provides a summary of the main findings in relation to investigations carried out on infrastructure and transport. Further details are available in Technical Papers - Volume 2, Infrastructure and Social Investigations.

3.1 Electricity, Telecommunications and Water Services

Electricity, telecommunications and water services are available to each Island.

The adhoc pattern of development has necessitated the introduction of special levies to cover the cost of reticulating electricity to allotments across the Islands. The levy would be removed once the Islands are fully reticulated. This is expected to be at the end of the 1998/1999 financial year for Macleay, Lamb and Karragarra Islands. Provision of reticulation on Russell Island has been slowed by lower than anticipated demand and the levy negotiated between Redland Shire Council and Energex is expected to be required until at least 2002.

Macleay, Lamb and Karragarra Islands have been fully serviced with reticulated water. Russell Island is not fully reticulated, however Council will provide water to any residential zoned lot on the Islands which has received building approval.

Whilst all residents should be guaranteed a safe and reliable water supply, the provision of reticulated water has raised concerns in regard to the ability of septic tank systems to cope with domestic waste water on existing residential allotments.

3.2 Sewerage

The findings in relation to sewerage are largely based upon the *Preliminary Sewerage Planning Report for the Bay Islands* (John Wilson and Partners Pty Ltd 1996). Key findings are detailed below:

- Ongoing use of septic tanks and absorption trenches for wastewater treatment and disposal was not sustainable on the Islands' typically small lot sizes (averaging 600-700 square metres).
- As infill development continues on the Islands, the incidence of septic effluent surfacing will increase along with public health risks.
- Alternative methods of on-site treatment and effluent disposal are likely to be similarly unsuited to allotments of this size, and the provision of a reticulated sewerage scheme was considered by the 1996 Sewerage Report as the most appropriate disposal system for the Islands.

- Unless substantial overall reductions in allotment density can be achieved it is likely that reticulated sewerage would need to be ultimately introduced. Such density reductions may only be achievable and/or a high priority within some catchments on the Islands which drain to sensitive receiving environments.
- Alternative interim measures may be required to reduce public health risks from catchments which may be substantially developed prior to it being economically feasible to provide full sewerage.
- The estimated cost of sewering the Islands is around $63 million. This includes $45.8 million to provide reticulation, $16 million to construct a treatment plant on Russell Island and $2 million for effluent disposal infrastructure.

3.3 Waste Disposal

Landfill sites for waste disposal are currently operated on all of the Bay Islands. Sites on Macleay, Lamb and Karragarra Island have limited capacity and are either impinging, or have potential to impinge, on wetland and intertidal environments.

The *Redland Waste Management Study* (1994) recommended the closure of the land filling operations on Macleay, Lamb and Karragarra Islands and the establishment of transfer stations on the current sites. The Karragarra transfer station will be retained.

Key elements of Council's waste management strategy for the Islands are:

- composting of organic/green wastes;
- provision of a waste advisory service;
- recycling service;
- maintenance of the landfill site on Russell Island; and
- transfer putrescible and other non organic solid wastes from Macleay, Lamb and Karragarra Islands to the mainland.

3.4 Water Quality

Stormwater runoff carries nutrients, sediments, rubbish and other pollutants into waterways and water bodies.

Small runoff volumes from minor rainfall events (eg. 1mm) contain higher concentrations of nutrients such as nitrogen and bio-available phosphorus than do larger runoff events.

Well maintained on-site wastewater systems which are not hydraulically overloaded (ie. effluent is adequately absorbed into the soil), contribute

between 5 to 10% of the nutrient loads in runoff water. Where there is a high rate of failures of on-site effluent treatment systems, wastewater can contribute a much higher proportion of the runoff water nutrient load.

Nutrient loads were modelled for various levels of development on the Islands in order to determine the extent of development which could occur before runoff water quality fell below "acceptable"(ANZECC) quality standards.

The initial nutrient loads adopted were 60% of those likely in the Brisbane metropolitan area. This reflects an expected lower level of fertiliser use, lower traffic levels, fewer domestic pets etc., expected on the Islands. The nutrient load will also be lower as a consequence of the sandy soil type and low levels of organic matter.

Results indicated that whilst total nutrient loads were lower than those on the mainland, the average nutrient loads from the high concentrations of small runoff events were still above ANZECC levels for modest dwelling densities.

Without measures to treat the large number of very small runoff events predicted to result from impermeable surfaces (roads, roofs, etc.), the density of development which could occur in catchments before nutrient levels in runoff from the catchment exceeded ANZECC guidelines was around 6 dwellings per hectare. It should be noted that the initial model runs simply took runoff from impermeable surfaces and routed these directly as runoff. In practice, a significant infiltration loss from small runoff events can be expected where the drainage lines are unlined and the soils are sandy.

With the introduction of *Best Management Practices* to increase water infiltration and nutrient take up from very small runoff events of around 1mm (such as vegetated buffer zones along drainage lines), the density could be increased to around 10 dwellings per hectare and still remain within ANZECC water quality guidelines.

This density is based on nutrient concentrations only. Unsewered development at this density would pose a public health risk.

Given the amount of non-developable land in most Island catchments, adequate water quality is likely to be achievable with the adoption of a range of water sensitive design measures and best management practice.

Stormwater runoff quality will be most critical in those catchments which drain to freshwater wetland areas of high conservation value, or tidal areas where poor tidal flushing would result in a low assimilation capacity. Such tidal areas include the Canaipa Passage and Lucas Passage.

As the Bay Islands only represent a very small fraction of the potentially urbanised area draining into Moreton Bay (less than 0.5%), apart from impacting on confined water ways and poorly flushed intertidal areas, development of the Islands is not expected to significantly impact on the water quality in well mixed parts of the Bay. Nonetheless, the adoption of water sensitive design (WSD) principles which embody a range of measures aimed at

the retention, treatment and reuse of stormwater for the environmental benefit will be required to protect sensitive catchments and near shore ecosystems.

Interim erosion and sediment controls to be implemented during construction and development would be required as a complimentary measure to long term stormwater management strategies.

3.5 Roads

The estimated cost to upgrade the current road network to mainland 'urban' standards is $64.7 million. Alternative road construction standards and implications for material sources and transport need to be explored following resolution of development scenarios. Savings in the order of 50% could be achieved if the need for reticulated stormwater is avoided.

One alternative for a "less engineered" road upgrading solution using narrower concrete roads and grassed table drains was initially costed at around $50 million. Subsequent refinements to the road network in light of the preferred strategy would see this cost reduced to around $36.1 million.

Careful integration of the road network and the stormwater management strategy will be required in order to achieve potential savings by minimising reticulated stormwater. Road cross sections will need to be designed to convey stormwater flows which have not been adequately allowed for in the subdivision pattern.

The high cost of road upgrading will mean these works will have to be staged to link with Council's funding capacities. Staging priorities will need to be identified based on existing and proposed levels of use and stormwater management priorities.

3.6 Transport

3.6.1 Water-Based Transport

The current water transport services have an estimated capacity of 4,400 passengers per day and 230 vehicles per day. Peak weekday passenger services tend to be at around 75% capacity. Peak holiday services tend to be overloaded, especially at Easter.

It is estimated that the vehicle ferry services could cater for a 50% increase in the Island population before additional services are likely to be required.

Operators indicate that ferry services could be readily upgraded to meet steady increases in demand. Peak demand loads from communities can be accommodated by additional ferry capacity and the introduction of express services. The major constraints to expanding ferry services are:

- the adequacy of the landing facilities;
- the capacity of mainland public transport services; and

- the possible environmental impacts of increased high speed ferry movements.

It would be more difficult and less desirable to expand *vehicle* ferry services to match population growth.

Secondary passenger landing locations will need to be located on Macleay and Russell Islands to avoid future congestion and to minimise future water transport distances. An integrated approach to the siting and management of both water transport facilities and public boat ramps and moorings needs to be adopted to avoid conflicts between the transport system and recreation users of the Bay.

Improved on-Island and mainland public transport systems are required to reduce dependence on private vehicles and parking requirements. Buses and "on-demand" taxis would be the most suitable forms of public transport.

A bridge link to Russell Island would reduce the demand on ferry services but not replace the need for water transport between Islands and between the remaining Islands and the mainland. Such a link would cost in the order of $80 million and have significant economic, environmental and lifestyle implications. There is currently no commitment to a bridge by Local or State Government.

There are a number of issues associated with the development of the water-based transport system which will need to be further addressed. These include the following:

- the coordinated location of jetties, boat ramps, transport terminals and associated facilities;
- the location, frequency and need for maintenance dredging of navigation channels and disposal options for the dredged material (in relation to this DoT has advised they are developing a maintenance dredging and disposal strategy for the main channel from Brisbane to the Gold Coast, and this may need to be extended to address other channels around the Southern Bay Islands);
- the type and number of vessels to be used and management measures for reducing foreshore erosion (speed limits, limited revetments);
- measures to reduce boat strike, although the main navigation channels are located outside areas of high conservation value (eg. designated turtle and dugong areas) and the value of such measures in light of the levels of recreational boating in the southern part of Moreton Bay need to be considered; and
- management of waste from the vessels.

3.6.2 Bridge Link to Russell Island

Background

The proposal to establishment a bridge linking Russell Island to the mainland originated in the 1960's in the form of a proposal for a bridge link to Stradbroke Island. One option considered for the bridge link included 'staged' construction through to Russell Island. The proposal was abandoned in the early 1980's following which the Russell Island bridge emerged as a separate issue.

Two route options for a bridge link to the Islands have been proposed, and these are discussed below.

(1) Pannikin Island Route

A Premier's Department report in the late 1980's examined proposals for the construction of a toll bridge in association with redevelopment of Russell Island. The main findings of the report were:

- a toll bridge would, at best, pay only for itself;
- island redevelopment to bring planning and services up to an acceptable standard would cost $100 - $200 million and would be essential if the construction of a bridge was approved; and
- land speculation would be a major problem in reducing the viability of replanning the island because of the need to acquire substantial land areas.

The cost of the bridge link was estimated at about $55 million. Recent estimates (early 1990's) placed the cost at $90 million. This costing relates to the bridge link across Pannikin Island from south of Point Talburpin on the mainland to the north of Brown's Bay on Russell Island.

The need for a bridge was subsequently questioned due to the adequacy of water transport services, the cost of a bridge and associated works construction and the potential to exaggerate the scale of current problems on the islands.

A Council report prepared in June 1988 also addresses issues relating to this ("The Pannikin Island Route") bridge link. The link consists of the following elements :

- a section of roadworks approximately 300 metres long to the foreshore of Moreton Bay from Cleveland-Redland Bay Road;
- a bridge section approximately 1.5 kilometres long to Pannikin Island,
- a length of causeway approximately 1.4 kilometres long across Pannikin Island;
- a bridge section approximately 1.6 kilometres long to Long Island;
- a section of causeway approximately 300 metres long across Long Island;
- a bridge section approximately 1.2 kilometres long to Russell Island; and
- a section of roadway approximately 1.4 kilometres long on Russell Island.

Based on the recommended cross sections for these elements, the total cost (1988) of the link was estimated at being in the range of $43.4 million for two lanes plus breakdown lane (low level) to $66.2 million for three lane tidal flow (high level). It was noted that a considerable amount of detailed investigation would be required to arrive at a truly reliable estimate.

(2) Rocky Point Route

The Pannikin Island Route would provide a route between Redland Shire to Russell Island. However, others (Ausplan Research, 1996) have suggested that consideration be given to a bridge link from Rocky Point to the south-west of Russell Island. The cost of this much shorter route was estimated at between $20-$30 million by Ausplan. More recent preliminary cost estimates (GHD, 1997) put the cost of this option at close to $40 million, and by the time the 13 kilometres of road linking the bridge to the Pacific Highway is realigned and adequately upgraded this cost could double. This estimate is exclusive of any property acquisition costs.

Implications of a Bridge to Russell Island

A bridge link to Russell Island is considered to be inconsistent with the expressed desire to retain the Islands' unique non-urban lifestyle. Irrespective of the questionable economic feasibility of a bridge, once physically connected to the mainland, Russell Island will experience the same processes that have led to the significant degradation of many of the mainland and fringing marine ecological systems. In brief, the implications of a bridge are seen to be as follows:

- A bridge to Russell Island would enable the Island to be developed with potentially all the services, facilities and suburban characteristics as a mainland outer suburb.
- A bridge and associated road upgrading is likely to cost in the order of $60 to $80 M. The implications are as follows:
  - development yield would need to be maximised in order to reduce the per capita construction costs (regardless of levy or toll);
  - maximising development yields would not be consistent with the express desire to maintain the Island character and lifestyle;
  - mainland level occupancy rates would eventuate on Russell Island contributing to this erosion of Island lifestyle/character;
  - car ownership, road construction standards and residential amenity would be typically suburban;
  - a bridge would be of little benefit to the other Islands, creating further 'leakage' from the Island trade catchment;
  - a bridge may retard the development of water transport services and facilities upon which residents from other Islands rely on; and

- a bridge would be inconsistent with the broader community's vision of the Islands as an important backdrop to Moreton Bay.

- There is generally a high level of satisfaction with the water transport system although clearly there are significant opportunities for upgrading. Capacity of the passenger transport service can readily expand to meet population growth and the future introduction of service contracts should lead to improved landing facilities and longer hours of operation.

- Substantial upgrading of public transport services both on the mainland and the Islands is needed to compliment the passenger ferry services.

- A bridge could not realistically feature in a development scenario for the Islands which has as its underlying tenet the objective of maintaining an Island character and Island lifestyle.

- A bridge would have an overall greater environmental impact on the Moreton Bay Marine Park. These impacts are likely to include:
  - increased permanent population and visitor numbers frequenting sensitive areas of the Russell Island foreshore;
  - increased recreational boating levels due to higher population and visitor numbers;
  - increased pressure for illegal jetties and disturbance of mangroves along the foreshores;
  - higher land values and therefore higher costs associated with acquisitions for stormwater management and protection of vegetated areas;
  - increased domestic pets and potential for destruction of, or disturbance to, native animals;
  - increased pollutants from roads and impervious areas; and
  - potential changes to coastal processes, coastal and seabed morphology and effects on tidal regimes, current pattern and water quality. Such changes may also result in the need for regular maintenance dredging.

Whilst it is acknowledged that a bridge could improve access to jobs and services on the mainland, these benefits are not considered sufficient to outweigh the negative implications associated with a permanent link to the mainland.

4. The Cultural Environment

4.1 Demographic Profile

According to the Australian Bureau of Statistics the population on the Islands in 1991 and 1996 was as follows:

Population	1991	1996	Compound Growth Rate
Russell	645	973	8.6%
Macleay	718	1,168	10.2%
Lamb	235	277	3.3%
Karra	49	83	11.1%
	1,647	**2,501**	

The Southern Moreton Bay Islands have the following key demographic characteristics:

- high annual average population growth rates;
- a relatively stable population, with the exception of Lamb Island which had a high proportion of people at a different residence 5 years previously;
- a particularly high proportion of people in the 50-64 age group, and also a high proportion of elderly aged over 65 years;
- a low proportion of children, teenagers and young adults;
- a high proportion of single person households and couples without children;
- low annual household incomes, with a high proportion of households earning under $8,000 per annum;
- very high rates of unemployment;
- low labour force participation;
- low occupancy rates, particularly on Karragarra Island, suggesting a significant proportion of holiday and weekender properties;
- high proportions of dwellings that are owned outright; and
- low car ownership, particularly on Karragarra Island.

4.2 Human Services

4.2.1 Identified Deficiencies

Transport and Communications

Transport to, from and on the Islands would appear to be the most pressing human services need facing residents of the Southern Moreton Bay Islands. Expense and travel time of public transport to the mainland can be a major deterrent for the unemployed to look for work, as well as young people seeking training.

Whilst the Islands are well served by vehicle ferry and water bus operated by private contractors during the day, only a limited and relatively expensive transport service is available at night. Transport around the Islands is also a concern eg. taxis are the only alternative to private cars on Macleay Island.

Island residents have also mentioned the high cost of communications which increases their sense of isolation.

Foreshore Access, Open Space and Recreational Facilities

Land-based recreation facilities or open space are inadequate. With the exception of the progressive acquisition of drainage problem areas, there has been little opportunity for Council to make provision for open space areas.

The lack of open space provision has contributed to a range of public access problems particularly between residential areas and the foreshore. It may also have contributed to the lack of development of recreational facilities and recreational opportunities spanning all age groups, but particularly for youths.

Health and Welfare Services

Community facility provision on the Southern Moreton Bay Islands is limited. Owing to the Islands' low permanent population, Island residents are otherwise required to access State funded community facilities and services located on the mainland. Access to these facilities and services is therefore an issue due to the transport implications.

Access to health services is a problem for some Island residents, with the greatest health concern being having a medical emergency. However, not all residents share this view.

With competing demands for services in the more densely populated communities of the Brisbane South region, service provision in the Southern Moreton Bay Islands is not likely to be given priority.

Children's and Youth Activities

There is a lack of activities and facilities for youth, and a perceived high incidence of social problems amongst young people on the Islands.

4.2.2 *Community Development*

Development of the Bay Islands Community Centre, in particular, appears to be already generating community spirit and self help. This centre is anticipated to serve all Island residents. Across the Islands there is understood to be friendly rivalry but a lack of community unity. There is strong interest in the island environments, and a strong desire to protect and retain the Islands' perceived unique lifestyle.

Action is required to counter the perceived negative stigma of the Islands via the mainland, particularly in relation to Russell Island.

4.3 Social Sustainability

An indication of social sustainability can be derived from three factors:

- access to community facilities and services;
- social and economic well being; and
- sense of community.

4.3.1 *Access to Community Facilities and Services*

Difficulties in Providing Facilities and Services

There is a significant barrier to the residents of the Islands accessing what is considered to be the "normal" range of community facilities and services necessary to sustain the social health of the community.

This raises the question of whether the expectation that these facilities and services should be available, is warranted or otherwise.

Difficulty in Classification of Service Delivery

The Islands as they stand, do not fit into agencies rural or remote service delivery category. They are classed as normal urban areas, and in terms of service population threshold, the Islands would rate poorly.

Alternative or Innovative Service Solutions

There is a need to set up alternative or innovative methods of service provision to suit a "dispersed" model such as the Islands. This is in accord with the trends in modern community services planning, again in response to restrictions in funding resources.

A further alternative is "bringing the people closer to the services". Any improvement in transport between the **Islands and the mainland** will increase accessibility to services which already exist on the mainland.

4.3.2 *Social and Economic Wellbeing*

An increase in access to community facilities and services should improve, but will not ensure the likelihood of social and economic wellbeing. There is also the issue that some residents have moved to the Islands for a cheaper existence

(and in some cases discovered the opposite) or those who might consider themselves "trapped" on the Island.

Improvements in transport and communications are considered essential to improving quality of life and to breaking the pattern of unsustainable social lifestyles which are appearing in some families. Social sustainability is unlikely to occur on the Islands without a substantial improvement in access.

4.3.3 Enhancing the Sense of Community

It is considered critical to social sustainability that a strong sense of "community" and indeed self-help is adopted on the Islands. Part of creating a community involves creating identifiable physical communities, with real centres in which people are drawn together, and public spaces for communal activity.

4.4 Implications Of Population Growth For Provision Of Human Services

All Islands should have at least a baseline of community facilities and services, which encourages community development and local support networks. The application of performance criteria to determine facilities and services which should be provided, rather than specification of particular facilities and services.

A moderate level of service provision might occur on Macleay Island and possibly on Lamb Island. This would reflect the higher level of population on that Island.

The highest level of service on the Islands should essentially be determined by the population threshold reached by the Island group as a whole. This level of service would appear appropriately located on Russell Island, where the ultimate population is likely to be highest.

Heritage items identified on the Islands are detailed in Appendix 2. Reference should also be made to the Technical Papers - Volume 2 (Infrastructure and Social Investigations).

4.5 Cultural Heritage

4.5.1 Legislative Framework

There are legislative requirements for the management of cultural resources at both the Commonwealth and the State level.

The *Australian Heritage Commission Act 1975* provides for items of aesthetic, historic, scientific or social significance for present and future generations to be included on the Register of the National Estate. Indigenous, archaeological and historic sites and places may be included on the Register.

The *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* provides for the protection of places and objects of significance to indigenous people in accordance with indigenous tradition. An application for relief under the Act can only be successful after investigation of the issues of the case, and a Declaration made only where the State or Territory can not or will not protect the place of objects concerned.

The *Native Title Act 1993* provides Aboriginal people with the right to negotiate with developers regarding actions which are likely to have an adverse affect on native title matters. Given the current situation regarding Native Title claims in Quandamooka, and the agreement between Quandamooka and Redland Shire Council, the right to negotiate provisions of the *Native Title Act 1993* must be considered in the development of land use planning programmes for Moreton Bay generally.

At the State level, the *Cultural Record (Landscapes Queensland and Queensland Estate) Act 1987* states that it is an offence to "… take, destroy, damage, conceal or interfere with" sites, items or places of indigenous or historic cultural value. Indigenous, archaeological and historic sites and places fall within the jurisdiction of the Act. Penalty provisions apply for breach of the Act.

Heritage Standards

The ICOMOS (International Council of Monuments and Sites) Burra Charter provides the guiding principles for the assessment and conservation of cultural heritage resources in Australia. Under the Charter, cultural significance "…means aesthetic, historic, scientific or social value for past, present or future generations"; and conservation means "… all the processes of looking after a place so as to retain its cultural significance". The fundamental management guidelines for heritage conservation as detailed in the Burra Charter may be summarised as:

So as much as necessary, as little as possible.

The draft National Heritage Standards provides guidelines for the identification and management of both natural and cultural heritage resources in Australia. The draft Standards address issues involving the identification and management of heritage resources; defines the characteristics and attributes for best practice in heritage conservation; and develops procedures, processes and protocols aiming for transparent heritage management processes addressing the often complex and competing cultural, social, and economic interests. The National Heritage Standards, and an understanding of best practice in heritage conservation for historic and indigenous places, are useful guides to initiate the development of heritage conservation planning.

4.5.2 Aboriginal Cultural Heritage

The Quandamooka people are the traditional owners of Moreton Bay, including the Southern Bay Islands. The concept of traditional ownership encompasses rights of inheritance, along with other rights, obligations and responsibilities for the country.

Places of Aboriginal heritage significance may be found on all landforms of Russell, Macleay, Lamb and Karragarra Islands. Archaeological sites are most likely to be found in coastal and immediate hinterland areas, with high points in the landscape a possible location for early-mid Holocene sites or even sites of late Pleistocene age. Other places, particularly resource areas and story places of significance to the Aboriginal people of Quandamooka are likely to be found associated with marine and swamp resources and high places in the landscape.

Table 4.1 lists the known indigenous cultural heritage sites on the Islands and identifies their significant value and management categories. Figures 5(a) and 5(b) depict the areas of indigenous cultural heritage significance.

The significance ratings of the sites have been separated from the management categories since it is acknowledged that some sites and places of very high significance value (Rating 1) may not be able to be fully protected (management Category 1), given the level of subdivision that has occurred on the Islands. The significance ratings and management categories are defined as follows:

Significance Rating 1	These sites and places are of very high scientific and/or Aboriginal significance.
Significance Rating 2	These sites and places are of high scientific and/or Aboriginal significance.
Significance Rating 3	These places are of moderate scientific and/or Aboriginal significance. They are often places which are partially disturbed and their research potential and/or social value is consequently reduced.
Significance Rating 4	These places are of low scientific and/or Aboriginal significance. They are often places which are extensively disturbed and their research potential and/or social value is thereby substantially compromised.
Management Category 1	Sites and places are of very high scientific and/or Aboriginal heritage significance and require absolute protection through acquisition and/or conservation zoning.
Management Category 2	Sites and places are in areas with low development impact and require implementation of land use planning controls that prevent damage to heritage sites and places.
Management Category 3	Sites and places are in actual or planned development areas and require specific management intervention to minimise damage to heritage sites and places.
Management Category 4	Sites and places are in actual or planned development areas and all reasonable steps are to be taken to maintain as much of the heritage site or places as is practicable, within the constraints of the built environment.

Table 4.1
Significance Ratings and Management Categories of Known Indigenous Cultural Heritage Sites and Places

Site Name	Significance Rating	Management Category
Russell Island		
Gaint's Grave	1	1
Brown's Bay middens	1-2	1-2
Turtle Swamp midden	4	1-2
Kibbinkibbinwa Point	1	1
Oyster Point	1	1-2
Bora grounds (E and SE of Island)	1	1-2
Rocky Point middens	1	1-2
Swamps, lagoons and other coastal resource areas	1	1-2
Other likely middens	3-4	1-4
Story places (southern end of Russell Island and Turtle Swamp area)	1	1-4
Macleay Island		
Corroboree Point	1	1
Point Perrebinpa to Point Pininpinin	1	3
Midden and burial (Perulpa Island)	1	2
Reburial location (Perulpa Island)	1	1
Coondooroopa	1	1-4
Tim Shea's Waterhole midden site	4	1
Thompson's Point	4	4
Cow Bay	1	1
Swamps, lagoons and other coastal resource areas	1	1-2
Other likely midden sites	3-4	1-4
Story places (eastern end of Macleay Island, north of Perulpa Bay)	1	1-4
Lamb Island		
Clarke's Point to Lamb's Head	2-3	1-3
Pebble Beach	1-4	1-3
Jeff Ward's midden (SW of Island Is.)	4	3-4
Ian Ward's Park Road Reserve and Wellers Bush Care midden	4	3-4
Thomas Lucas Waterhole midden	4	3-4
Swamps, lagoons and other coastal resource areas - including waterholes	1	1-2
Other likely middens	3-4	1-4
Story places (central eastern side of Lamb Island)	1	1-4
Karragarra Island		
Possible shell midden (east end of Island)	1-2	1
Midden (west end Island)	1-2	1-2
Swamps, lagoons and other coastal resource areas	1	1-2
Other likely middens	3-4	1-4
Story places (western end of Karragarra Island)	1	1-4

Site Name	Significance Rating	Management Category

Many of the known cultural sites and heritage places on the Southern Bay Islands, as well as those places predicted to occur on the basis of previous archaeological and geomorphological research, occur in areas which have been subdivided for development. Consequently, measures will be required to avoid unnecessary site destruction and to minimise damage to sites and heritage places as part of the development process on the Islands. Such measures should include supervision of site works on multiple block developments by representations from the Quandamooka Land Council Aboriginal Corporation (QLCAC) together with community awareness campaigns to foster interest in indigenous cultural heritage.

Specific measures to protect/manage the known sites of significance will also need to be established. Most of these sites fall within areas of medium, high or very high conservation priority which also warrant protection on conservation grounds.

4.5.3 European Cultural Heritage

The Southern Moreton Bay Islands have a rich history of European settlement. Since the time of first European settlement in the 1860's the Islands have been associated with a range of diverse industries. These include the oyster industry, timber cutting, the salt industry, maritime transport and farming.

A number of buildings and sites remain today as a legacy of these past activities on the Islands. Some 32 historical heritage sites have been identified by the community which have been assessed as being culturally significant, 9 on Russell Island, 14 on Macleay Island, 8 on Lamb Island and 2 on Karragarra Island. All sites were given a community value rating of High, Medium or Low based on recommendations by the community as to the importance given to the site by local Islanders. The heritage significance was also given for each site, classifications being as follows:

1. Historic value
2. Aesthetic (landscape and architectural) value
3. Scientific value
4. Representative value
5. Integrity.

These sites are listed in Table 4.2 and shown on Figures 5(a) and 5(b).

Table 4.3
List of Historic Sites

Site Name	Site Type	Community Significance	Heritage Significance

Site Name	Site Type	Community Significance	Heritage Significance
Russell Island			
Canaipa Precinct	Historic precinct (1860)	High	1,2,3,4,5
Willes Homestead	Dwelling (1890s)	Medium	1,3,4
'Weary' Willes House	Dwelling (1890s)	Medium	1,3,4
Jackson's House	Dwelling (1920s)	Medium	1
Phyllis Jackson's House	Dwelling (1920s)	Medium-Low	1
'Jacksonville'	Wharf precinct (1920s)	High	1,3,4,5
State School	Education (1915)	Medium	1,3,4
St Peter's Parish Hall	Religion (1920s)	Medium	1
Mrs Fischer's Grave	Grave (1906)	-	-
Macleay Island			
Campbell's Saltworks*	Agriculture/Industry (1866)	High	1,2,3,4,5
Campbell's Wharf	Maritime transport (1865)	High	1,3,4,5
Lion's Park	Public Recreation	High	1,2,3,4,5
Dixon's Trig Station	Surveying/Recreation (1840)	Low	1,3
Campbell's Fish Trap	Fishing (1860s)	Medium	1
Kanak Fish Trap	Fishing (1860s)	Medium	1,3
Cow Bay Precinct	Dugong hunting (1865)	Medium	1,2,4,5
Shaw's House	Dwelling (1890s)	Low	1
Lovell's House	Dwelling (1900-1920)	Medium	1,2,5
McCaskell's House	Dwelling (1930s)	Low	1
'Eastbourne'	Dwelling (1920-30s)	Medium	1,4,5
Arboretum	Agriculture (1890)	Medium	1,2,3
Tim Shea's Waterhole	Public utility (1865)	Medium	1,2,3
Roger's Well	Public utility (1820s)	Low	1
Lamb Island			
Pioneer Hall	Community Hall (1924)	High	1,3,4,5
Mango Trees	Significant trees (1890)	Low	1,2
Harry Brook Reserve	Nature Reserve	Medium	2,3,4
Jetty Shed	Maritime transport (1939)	High	1,3,4,5
Thomas Lucas Grave	Convict Grave (1834)	High	1,4,5
Eric Noyes Farmhouse	Dwelling (1911)	Medium	1
Brook's Packing Shed	Agriculture (1920)	Low	1,4
Noyes Slipway	Maritime transport (1916)	Medium	1,4
Karragarra Island			
Noyes Farmhouse	Dwelling (1900)	Medium	1,4,5
Noyes Oyster Lease	Marine Industry (1860-1910)	Low	1

*Provisionally entered on the Heritage Register under the *Queensland Heritage Act 1992* (File No. 601062)

A further site subsequently identified is Mrs Fisher's Grave. Although the significance of the site has not been assessed, it is likely to be of importance to the community and particularly family members.

Strategies for the ongoing management of these sites need to be formulated in conjunction with the Island community.

5. Economic Sustainability

5.1 Employment

Employment opportunities on the Islands are limited to a number of small population serving enterprises and trades. The total number of people with "on-Island" employment is estimated at around 200.

There is no significant economic activity on the Southern Moreton Bay Islands which supports the Island populations. As a result, an estimated 500 Island residents commute to the mainland daily for employment.

Without population supporting economic activities (as distinct from population serving activities), the Islands are unlikely to attract a "balanced" population profile as found on the mainland. This can be viewed as either an impediment for the future development of the Islands, or a feature which will assist the retention of a unique Island lifestyle.

As a consequence, population supporting economic activities or ready access to such activities (on the mainland) is required to sustain a mainland level of services and facilities. It should be noted that such a level of services and facilities appears to be neither expected nor warranted on the Islands.

5.2 Economically Sustainable Population Levels

Several population scenarios were considered for the purposes of identifying economic implications, as follows:

- The highest population, approximately 33,000 residents (based generally on the existing number of residential allotments) would support a comprehensive range of commercial and retail services and facilities. Such a population could not be sustained without significant levels of population supporting economic activity.
- Only significant improvement to the transport network (eg. a bridge link to Russell Island) coupled with a major business and industry area on the mainland in relative close proximity to the Islands, could possibly substitute for a lack of economic activity on the Islands.
- A population of 20,000 would support the same range of commercial services to the Islands and would require less on-island population supporting economic activity or commuter transport capacity.
- A population of 10,000 could only support much lower order retail and commercial facilities (although a considerably greater range and higher order than the existing), and there would still be reliance on the mainland for major shopping items.

- A population with a high proportion of welfare recipients would create an "unbalanced" local economy on the Bay Islands with a wide range of services, normally generated by a similar sized population, not emerging. Hence, many of the employed islanders will have to seek these services on the mainland, probably at the nearest points of disembarkation, namely Redland Bay or Cleveland. This situation will increase the demand for retail, commercial and professional services and service trades, in particular, at these two mainland centres.
- Lower levels of self-sufficiency would result from populations exhibiting a high proportion of welfare recipients.

5.3 Economic Implications of a Bridge to Russell Island

A bridge to Russell Island would dramatically change the economic dynamics of the Bay Islands. Implications are likely to include the following:

- improved access to employment and services on the mainland from Russell Island, thereby improving economic sustainability of settlement on this Island;
- a reduced level of local services on Russell and the other Islands due to "leakage" to the mainland;
- a split in economic behaviour patterns, with demand for economic activity at Beenleigh (Rocky Point Link) or Redland Bay (Pannikin Island Link);
- less locally based employment;
- greater number of commuters living on Russell Island;
- higher settlement demands particularly on Russell Island; and
- possibly increase inter-Island transport demand.

The Pannikin Island bridge option, would lower the need for population supporting economic activities on the Islands, by effectively making the Island a commuter suburb of Brisbane.

5.4 Tourism Potential

Tourism opportunities for the Southern Moreton Bay Islands focus on catering for the day tripper market or family holidays/short breaks.

There is general recognition in the community that tourism would provide some economic benefit to the Islands, but it should not be at the cost of Island lifestyle.

There is presently a significant lack of facilities for tourism and very few facilities to attract day visitors not visiting friends or relatives.

Opportunity exists to provide services to the recreational boating market particularly on Macleay and Russell Islands. On Lamb and Karragarra Islands future tourism opportunities are likely to be related to arts and craft industries or in the provision of eco-tourism tours. The development of short stay accommodation would also be consistent with the Island lifestyle.

6. Key Findings from Community Input

6.1 What the Community is Saying

The first phase of the community consultation process included media releases, two newsletters, (the second of which included a response sheet seeking feedback on the public's vision for the Islands), establishment of a toll-free telephone service, review of public submissions, three community workshops, three discussion "days" and four Community Reference Group Meetings.

The proportion of submissions received from the various stakeholders and interest groups is as follows:

- Island Residents (16%)
- Absent Landowners (66%)
- Holiday Residents (2%)
- Interested Members of the Community (1%)
- Unknown Origin (15%)

The range of issues that have been raised by members of the community include:

- ***Access*** - the need for late night transport to and from the islands, more car parking facilities, provisions for the disabled and comments regarding the need for a bridge to Russell Island;
- ***Aesthetics*** - such as the need to retain the natural appearance of the Islands;
- ***Amenities*** - such as the need for health services, improved walkways and cycle paths, additional community services, sewerage, a recreational jetty, shelter at the ferry terminals, a camping ground, more retail shops and overall better public facilities;
- ***Development*** - mixed comments for and against further development, but any development is to be "sustainable";
- ***Drainage*** - comments querying the uses permitted on drainage problem land;
- ***Economics*** - such as the high cost of Island living and including the price of ferries, groceries and telephone calls;
- ***Environment*** - such as the unnecessary destruction of flora and fauna, the mosquito problem, the effect of sewage and pollution on the marine life, the destruction of mangroves, erosion and the provision of more parks and open space;

- ***Planning*** - such as the need for careful planning to ensure that the Islands are not spoilt;
- ***Rates*** - such as the need to channel more rate monies for use on the Islands; and
- Additional issues, including the control of cats and dogs on Russell Island, crime and declining land values.

6.2 Consensus Community Views

Matters on which there appears to be broad community consensus are listed below together with some relevant findings from the study and implications for strategy development.

(a) There is need for improved access to the mainland from all Islands and particularly during evenings and at night.

Relevant Findings and Implications

- The water passenger transport service can readily be upgraded to meet demand. However, threshold load levels must be achieved to make it viable for the operators of the water buses. The more expensive alternatives - water taxis are available on demand.
- Service frequency needs to be related to mainland public transport.
- Subsidised publicly operated water transport is not supported by the Government. The introduction of service contracts for private operators is broadly favoured (by government and operators alike) and could be the appropriate mechanism through which extended service hours could be negotiated.
- Service contracts would also give operators security to invest in on-shore loading facilities.
- Population growth and government policy in relation to service contracts and public transport provision are likely to be most influential in improving transport services to the Islands.
- A bridge to Russell Island would improve access for residents only on that Island and change the role and character of the Island to that of an outer metropolitan suburb.

(b) Development on the Islands must be responsive to the environment.

Relevant Findings and Implications

- The Islands have significant environmental and visual landscape attributes including large areas of remnant vegetation.
- The existing subdivision pattern fails to take these environmental attributes into account. This could only be addressed through block amalgamation, land acquisitions and other measures which reduce vegetation through removal or disturbance.
- The existing allotment sizes are too small to sustain on-site effluent disposal, and full development is likely to result in surfacing effluent and subsequent public health risks.
- Sewerage is likely to be required to service the existing subdivision pattern to eliminate public health risks from effluent.
- Given the extent of development that the existing subdivision pattern could deliver, urban runoff controls and stormwater treatment measures will be required to ensure water quality in the wetland areas and intertidal areas is protected.
- Existing fire management controls introduced to protect property have major implications for vegetation retention when allotment sizes are as small as those on the Islands.

(c) The Islands' environment and lifestyle opportunities are what attracted the majority of residents and many landowners.

Relevant Findings and Implications

- The existing subdivision pattern is essentially a "suburban" one and as it stands, is not conducive to the achievement of an Island lifestyle.
- A strong emphasis on Bay access (both physical and perceived) will need to be embodied in future development to achieve this lifestyle. This will require lot acquisition, foreshore resumptions and careful siting of public areas and facilities.
- There are a number of key visual influences which contribute to the Island environment and character to which development will need to respond. These not only include vegetation and landform features, but also the existing roadways. The treatment of roads and levels of traffic they carry will significantly influence Island environment and lifestyle.
- Provision of a bridge to Russell Island would see this Island develop as a metropolitan suburb.

(d) There is a need for some additional facilities and services on the Islands to reduce reliance on the mainland.

Relevant Findings and Implications

- Agencies do not see the provision of services on the Islands as a priority due to the Islands' low population and proximity to Brisbane.
- Innovative or joint solutions to service provisions will be necessary. Improved transport (lower cost, improved system interconnectivity) is necessary to improve accessibility to services on the mainland and between Islands.
- A wider range of facilities and services could be supported by a larger population on the Island group. A population of between 10,000 and 20,000 could possibly sustain a sufficient range of facilities and services required for relative self-sufficiency on the Islands.
- A full range of 'mainland' level services and facilities could not be supported on the Islands without a substantial base of population serving economic activity. A bridge link between Russell Island and the mainland may substitute for such economic activity on that Island.
- Provision of the conditions necessary for this full range of services would be contrary to the maintenance of an Island lifestyle.
- The long term development strategy for the Islands must signal the range of services and facilities likely to be available, thereby capping expectations of prospective purchasers and residents.

(e) There is a need for some tourism development, but it should be consistent with the maintenance of an Island lifestyle.

Relevant Findings/Implications

- Tourism industry development provides some opportunity to provide population supporting economic activity and employment.
- Recreational boating, eco-tourism and catering for the day-tripper market would appear to provide the main opportunities for tourism development.
- Such activities should be relatively confined so as not to impinge on the Island lifestyle enjoyed by residents.

(f) There is need for improved planning on the Islands to protect the Island character and prevent sub-standard building forms.

Relevant Findings/Implications

- Whilst building style should reflect an Island rather then suburban character, the potential density of dwellings, given the existing subdivision pattern, is considered the greatest threat to Island character.
- Use of open space corridors, vegetation conservation measures together with amalgamations and acquisitions wherever most achievable, will be required to protect Island character.
- There is need to introduce controls to prevent substandard levels of construction on the Islands.

(g) The Island's individual character should be reflected in development strategies

Relevant Findings/Implications

- Each Island should be provided with a basic level of community services and facilities which can provide a focus for community interaction and development.
- Development of cohesive Island communities can serve to offset lower levels of accessibility to mainland standard facilities and services.
- Development strategies should be cognisant of each Island's unique features such as relative proximity to the mainland, existing nature and extent of development, environmental attributes and community aspirations.

6.3 Competing Community Views

(a) Should a bridge be provided to Russell Island?

Relevant Findings/Implications

- Three schools of thought emerged in relation to a bridge to Russell:
  - those that see a bridge as essential to the future development of the Island;
  - those that thought a bridge would be an anathema to the Island's lifestyle;
  - those that were generally ambivalent although questioned the capacity of water based transport to cope with future development.

A bridge has been assessed as inconsistent with the notion of environmental sustainable development on Russell Island and the image of Island life, supported generally by the community.

(b) The desirable/sustainable density of development.

Relevant Findings/Implications

- Many residents have expressed the desire for low-density development. Some have purchased adjoining lots to guarantee this.
- Non-residents seek development that is environmentally friendly.
- The subdivision pattern will allow neither of the above aspirations to be achieved without significant dilution through government intervention or voluntary amalgamations.
- Wholesale amalgamations or acquisitions and resubdivision would not be feasible due to costs. Strategies should focus on other measures to dilute the subdivision pattern (eg. through open space corridors, acquisition of key sites/habitats), together with other measures which provide incentives for lot amalgamations.

(c) The nature of development and the type and range of facilities which should be available on the Islands.

Relevant Findings/Implications

- As noted previously, it is neither likely nor desirable that a full range of urban facilities and services could/should be sustained on the Islands. An appropriate range of services required to reduce reliance on the mainland should be targeted and threshold populations identified.
- Prospective future residents and purchasers need to be fully informed of the extent and nature of development and services planned for the Islands, to ensure their expectations relate to an Island rather than suburban lifestyle.

(d) The need for special measures to protect the environment such as controls on domestic animals and clearing of vegetation.

Relevant Findings/Implications

- There would appear to be widespread community support for protection of the environment on the Islands. There is less consensus on the type and severity of measures which should be introduced to protect the environment.
- Priorities for protection should be the threatened marine and terrestrial flora and fauna species. There is a legislative obligation to protect such species.
- The Islands' physical separation from the mainland suggests controls such as the responsible management of dogs and possible ban on cats, together with measures to protect habitat areas, would be effective in protecting fauna species such as the False Water Rat and wading birds.

- Domestic pets (dogs) have been identified as a significant source of nuisance on the Islands, although their value for security in this low density residential environment is recognised.

- The majority of areas now containing remnant vegetation are subdivided and under fragmented ownership. Retention of vegetation in these areas where the average allotment size is 500-600 square metres is not likely to occur without some level of intervention.

- This issue is particularly critical in those areas having the highest conservation priority values. Analysis has shown there are some 3,627 residential allotments in the three highest conservation priority categories.

- A range of objectives and measures for vegetation retention in each conservation priority category should be prepared as part of the development options, and community responses reviewed.

6.4 Issues on which no Collective Views have Emerged

(a) What Defines Island Lifestyle?

- No clear view of what characterises island lifestyle has emerged, although input to date suggests that the following elements contribute to lifestyle:
  - spacious development
  - few cars and little traffic
  - access to the foreshore
  - peace and quiet
  - focus for community activities
  - the natural environment
  - community cohesion

- All of these components are under threat as a result of the existing subdivision pattern.

- A vision for the Islands based on these components is put forward in the following section.

(b) What Priority should be given to Protection of the Islands Environmental Assets?

- Whilst the community has expressed a general desire for development to be responsive to the natural environment, there is no collective view on what priority should be given to the protection of natural attributes.

- Implications for development of conservation priority areas established on technical grounds, need to be determined with community input.

- Irrespective of the above, there are legal requirements to protect rare and endangered species.

7. Island Image and Principles

The outcomes of the various technical investigations together with the early stages of the consultation process, led to the formulation of a 'vision', or image statement, for the Islands. This image, together with supporting planning principles through which the image will be achieved, are described below.

7.1 Image

The Southern Moreton Bay Islands are inter-connected and both collectively and individually have a distinct character. Their location, quality of natural environment and existing level of infrastructure provide a unique opportunity for a blend of Island living and nature conservation. The popular recreational boating waters of Southern Moreton Bay further suggest the Islands are well placed to provide a range of recreational and tourism uses which are consistent with their setting within the Moreton Bay Marine Park.

With the above in mind, a picture of how life on the Islands should be in, (say) 10 years time is as follows:

> *The lifestyle enjoyed by the Island residents is directly influenced by the Islands' unique location and environment. The built form is distinctive and reflects a style and character consistent with the island lifestyle sought by residents. Appropriate public infrastructure is in place to support this lifestyle. Development is supported by an efficient water-based transport service between islands and the mainland. A suitable road and pedestrian/cycle network supports the needs of residents and visitors. Employment opportunities include providing services to residents, island based education and research activities, and catering for day tourism plus the recreational boating industry.*

In support of this Islands image, a number of development principles and broad policies needed to implement them, have been prepared under the following themes:

- lifestyle;
- landuse and development;
- community development;
- access and transport;
- environment and conservation;
- utility infrastructure; and
- open space and recreation.

7.2 Principles of Development

Principle 1 - Lifestyle

Development on the Islands should reflect an affordable and 'easy going' Island lifestyle. Characteristics of this lifestyle would include a desire for high levels of access to Moreton Bay and lower reliance on both private transport and the need for immediate accessibility to suburban services and facilities.

Policies

- Encourage the use of public or community based transport and, particularly on the smaller Islands, private non-motorised transport.
- Adopt, design and siting controls to limit inappropriate foreshore development.
- Adopt measures to improve public access to appropriate foreshore areas.
- Make further provision for public jetties and boat ramps.
- Encourage a wider range of commercial and community facilities which provide greater self-reliance.
- Retain the Islands' unique lifestyle as an alternative to that available on the mainland.

Principle 2 - Land Use and Development

Ideally, development should reflect the individual landscape character of each Island and be responsive to the natural environment and unique setting of the Islands within the Moreton Bay Marine Park.

Policies

- Wherever practicable, amend the existing subdivision pattern to provide greater opportunities for more space between dwellings together with provision for open space and other non-residential land use.
- Seek other land uses together with design and siting controls to help achieve a balance between development and protection of the existing Island character.
- Through design and siting innovation, promote a building character that reflects the Island lifestyle and the Islands' landscaped appearance.
- Through the use of density controls, reduce the potential for development in areas of high conservation priority, of high visual sensitivity and along drainage lines and foreshores.
- Wherever practicable, provide biological buffers between wetlands (freshwater and marine) and development.
- Continue to preclude poorly drained land and land effected by the tidal surge from residential development.

- Promote the establishment of communities which have as their focus carefully located community facilities and shops which promote interaction with and access to, Moreton Bay.
- Adopt development strategies for each Island which reflect their relative location in the Bay, capacity for development, existing character and community aspirations.
- Introduce appropriate development controls or management programs to protect development in areas of environmental hazard such as bushfire risk and slope instability.

Principle 3 - Community Development

The emergence of socially cohesive communities will be promoted and supported by a range of services and facilities which provide a higher level of self-reliance.

Policies

- Concentrate shops and community facilities to create local centres and places for residents to meet and interact.
- Major facilities and shops to serve the entire Island population should be located on Russell and Macleay Islands.
- Promote opportunities for population-supporting employment activities which are compatible with the Islands' lifestyle.

Principle 4 - Access and Transport

The Islands will be accessed by an efficient and convenient water-based transport system which will be fully integrated with public transport services both on the Islands and the mainland.

Policies

- Promote the progressive development and upgrading of the water-based transport system and related infrastructure including jetties, public amenities, carparking and other facilities.
- Promote the upgrading of the on-island and mainland public transport system and greater co-ordination between these public transport services and Island ferry services.
- Establish additional passenger jetties on Macleay and Russell Islands, to increase water transport use and efficiency and to provide possible focal points for future community facilities.
- Promote a water-based transport system that caters for extended hours of demand and a range of community needs.

Principle 5 - Environment, Conservation and Cultural Heritage

Adopt a holistic approach to environmental management of the Islands which provides protection for areas of environmental and cultural significance and which is sustainable.

Policies

- Adopt measures (such as land purchasing or resubdivision) that minimise vegetation loss.
- Control development which could be detrimental to significant heritage places.
- Promote the protection and establishment of indigenous flora and fauna and encourage the re-establishment of indigenous flora.
- Control development which could be detrimental to vegetation in areas of conservation priority, on foreshores and in visually prominent locations.
- Adopt measures to minimise the contamination of estuarine areas, creeks and wetlands by stormwater, maximise the infiltration of water into the ground, reduce the velocity of stormwater and remove contaminants from stormwater. Measures may include:
  - flow rate mitigation, erosion controls and providing infiltration areas;
  - grassed or vegetated drainage lines, vegetated buffers, and conservation or restoration of riparian vegetation; and
  - artificial wetlands, gross contaminant traps, retention basins and trash racks.
- Establish stormwater systems that have regard to the needs of the local population, particularly in relation to:
  - minimising ecological impacts;
  - acceptable health risks, landscape appearance, protection from flooding, public safety and other social concerns;
  - using stormwater for recycling; and
  - using drainage corridors as open space and recreation areas.
- Build contaminant controls and re-establish riparian vegetation in degraded drainage corridors.
- Consider viable alternatives to the release of stormwater into waters with poor circulation.
- Adopt erosion and sediment control measures for development during construction.

Principle 6 - Utility Infrastructure Provision

Infrastructure will be progressively provided to the Islands to a standard that not only meets community health and safety requirements and environmental imperatives, but which also respects the Island character.

Policies

- Reticulated sewerage should be provided to urban development to reduce public health risk and environmental impact from on-site effluent disposal as catchments become increasingly developed.
- Alternative forms of on-site effluent disposal should be considered for lower density development in non-urban areas.
- Adopt "Island-sensitive" solutions to road construction that better reflect future traffic flows.
- Adopt measures which minimise the environmental and visual impact of road and utility service provision.

Principle 7 - Open Space and Recreation

There should be enhanced public access to public open space and recreation facilities.

Policies

- Provide a connected public open space and pedestrian/cyclist pathway network on each Island.
- Provide strategic opportunities for the future provision of public recreational facilities within the open spaces and along foreshores (including boat ramps and jetties) compatible with the marine park setting.

Principle 8 - Tourism

Encourage development that caters for low key tourism and recreational boating on Russell, Macleay and Lamb Islands, to the extent appropriate within a marine park.

Policies

- Provide opportunities for increased day trippers and recreational boating.
- Promote the development of eco-tourism and other forms of tourism which serve to promote the Islands' unique natural and cultural attributes.
- Provide for public boat berths and moorings in suitable locations.

8. Alternative Development Scenarios

8.1 Background

The future outlook for the Islands suggested by the existing planning and environmental management practices *currently* in place is at odds with both the community's image of how life *should* be on the Islands, and with the need to protect the Islands' environmental attributes.

Mindful of this, four alternative development scenarios have been prepared for the Southern Moreton Bay Islands.

The first three scenarios evolved from consideration of the broad image of the Islands and supporting development principles derived from the work completed to date. The key principles underlying those scenarios deal with the following themes:

- Lifestyle - 'island' not 'mainland';
- Achievement of greater levels of economic self-reliance; and
- Environment and Conservation.

These themes relate respectively to the three basic components of sustainability:

- Social;
- Economic; and
- Environment.

The remaining development principles:

- Land Use and Development;
- Access and Transport;
- Utility Infrastructure;
- Open Space and Recreation; and
- Tourism;

generally provide a support role, rather than directly determining the nature of future development.

The fourth scenario, whilst also reflecting the broad image for the Islands and various development principles, is basically a limited intervention approach. As such, it is based largely on the existing planning framework modified only where necessary to meet the fundamental ground rules for development as expressed through the development principles.

These scenarios are shown in Figures 6(a)-6(d).

A possible fifth scenario which would maximise environmental protection of the Islands would involve the acquisition of all the presently undeveloped lots and incorporate them into an open space or conservation designation. This scenario was not considered in any detail due to the high costs (acquisitions alone would cost at least $70M) and the clear questions relating to the equity of such a solution.

8.1.1 Common Assumptions to all Scenarios

A number of assumptions have been made which are common to all scenarios. These are as follows:

- All precincts which are *not* subject to subdivision restructuring will be ultimately serviced by reticulated sewerage. However, the scenarios may differ in terms of the extent and priorities for sewerage reticulation, and some scenarios may better lend themselves to the adoption of alternative interim measures for sewage treatment and effluent control.

- Alternative methods for sewage treatment and effluent disposal would be considered for precincts in which subdivision restructuring occurred. The type of system would be dependent on allotment sizes produced. No on-site disposal would be considered for allotments less then 4,000 m^2.

- Spine roads would be constructed with a 6 metre wide seal on an adequately designed low traffic pavement with kerb and channelling on one side where appropriate. Wherever possible drainage will be by grassed table drains in preference to underground piped drainage systems, which will be kept to a minimum.

  Some additional requirements will be necessary in commercial areas, heavily trafficked areas and in steeper areas subject to erosion.

  Most other roads would have a 3.5 metre seal (possibly concrete) with a one-way crossfall and grassed table drains where practical. The possibility of cul-de-sacing some of the streets and adopting some one-way systems will be considered.

- All areas currently identified through this study as being required for stormwater purposes are to be acquired by Redland Shire Council. This includes land required for stormwater drainage corridors. These areas are identified on the stormwater acquisition plan.

- Development is precluded from all areas identified by this study as having a very high conservation value.

- As a long term management objective, all Residential A lots in any conservation priority area in which development is excluded would be acquired.

- All scenarios are reliant on the development of the water based transport system. It has been assumed that the water transport capacity will be progressively increased to cater for island population growth.

- The occupancy rate for the Islands has been assumed at 2 persons per dwelling. This is considerably higher than that currently on the Islands (which is less than 1.5 for all Islands) but lower than the average occupancy rate for the Shire which is 2.85. Adoption of this occupancy rate reflects the ongoing attraction of the Islands for retired couples and "empty nesters", but allows for a higher proportion of standard households than at present. This rate is similar to the occupancy rate of Coochiemudlo Island which was 2.1 in 1996.

- All scenarios are based on the total water management principles aimed at minimising the contamination of stormwater and discharges to the marine environment. The range of measures adopted to achieve this will vary with each scenario and are dependent on the characteristics of each catchment, their receiving waters, and the extent of development.

- All scenarios aim for a lower overall reliance on private transport by featuring open space, pedestrian and cycleway networks and opportunities for the development of additional passenger ferry terminals. An on-island public transport system is fundamental to each of the scenarios.

- Only limited opportunity for major employment generating activities are featured in the scenarios. The Islands are not an appropriate location for enterprises which are reliant on high access needs for the transport of inputs and products. The setting within a Marine Park further limits their suitability for a wide range of employment generating uses. It is assumed that the principal employment opportunities will be those from population supporting economic activity, tourism, education and/or research facilities.

- The incidence of midges and mosquitoes on the Islands has not influenced the pattern of development. Given the extent of existing subdivision on the Islands, we have adopted the approach that building controls, use of screens and public awareness/education, would prove the more cost-effective measures for minimising risk of insect spread disease. These measures would be in combination with Council's on going management strategy.

- Active and passive open space provision on the Islands must be based on the specific needs of each Island community rather than the usual mainland standards of provision.

- The provision of community facilities and services will similarly be based on specific development models rather than generally accepted benchmarks applicable to the mainland. A performance based model of service provision has been adopted under each development scenario.

- No residential development would be permitted below RL2.4 metres.

- No further subdivision of land zoned Comprehensive Development or Rural Non-Urban has been considered.

8.2 Alternative Scenarios

8.2.1 Scenario 1

Description

This scenario maintains the existing Island lifestyle, rated by many of the current residents as the principal reason for moving to the Islands. A spacious and informal pattern of development contributes to this lifestyle along with strong linkages to the waters edge and Bay beyond. Lack of vehicle traffic and intrusive visitors are also important contributing factors to this lifestyle.

Only relatively basic levels of retail and commercial facilities would be available on the Islands, although a greater level of self-sufficiency than currently achieved is envisaged.

The Islands would not appeal to those seeking or reliant on convenient access to a wide variety of retail commercial, health/welfare or community facilities. In this regard the Islands would provide a clear alternative lifestyle choice to that available on the mainland.

The individual characteristics of each Island and respective opportunities provided would be promoted. In this context, Macleay Island may offer a different lifestyle opportunity (ie. more commuters) than Russell Island.

Development/Settlement Pattern

This scenario would seek to deliver an overall reduction in density across the Islands. A wider range of lot sizes than currently available would be achieved and opportunities for the clustering of development identified.

While some precincts, blocks or part thereof have been substantially developed, others have little development and would provide opportunities for subdivision restructuring. Wherever possible, this restructuring would aim to deliver (through various means) overall densities of 1 dwelling per 1000 m^2 in precincts of low conservation priority and areas outside the conservation priority designations.

Areas of high conservation priority would be excluded from development along with areas of very high conservation priority.

Wherever possible, precincts in medium conservative priority and areas of high visual landscape sensitivity not included in the higher conservation priority areas, would be restructured to achieve a lower overall density of 1 lot per 2000 m^2, which could also deliver benefits in terms of reduced roadworks.

Precincts or parts thereof draining to sensitive catchments would become the priority areas for lot restructuring. Nutrient modelling is underway to identify desirable suitable levels of development and storm water management measures in these catchments.

Clustering of development to retain conservation areas or to provide land for stormwater management measures could be considered only in the context of a subdivision restructuring scheme. Existing allotment sizes allow very little scope for clustering unless medium density style development was contemplated. Medium density development is not considered consistent with this lifestyle scenario. **As a rule, clustering would only be achievable where the total number of lots in a precinct or block can be reduced.**

Clustering has the potential to deliver significant savings in infrastructure costs.

Population and Allotment Yield

Under this scenario the preliminary estimate of lot yield and ultimate number of residents on each Island would be as detailed in Table 8.1.

Table 8.1
Estimated Lot Yield and Resident Population - Scenario 1

Island	Number of Lots	Population
Russell	4,511	9,022
Macleay	2,796	5,592
Lamb	491	982
Karragarra	192	384
TOTAL	**7,990***	**15,980**

**If the trend of purchasing 2 or more lots is maintained, and these lots were amalgamated, the total lot yield could be reduced by around 8-10%.*

Commercial and Community Services

A basic level of retail, commercial and community facilities would be provided, sufficient to meet day to day needs, and of a nature and scale consistent with the Islands' lifestyle image.

Population levels under this scenario would probably only sustain neighbourhood level centres on both Macleay and Russell Island. In both cases these would be located at the commercial nodes adjoining the water access hubs.

An additional commercial node would be envisaged along the principal spine road of both Islands. On Macleay, this could be focussed at the existing shopping centre.

Additional convenience centres which serve a dual role as an access point to the Bay and public transport nodes are also envisaged. On Macleay Island this would be on Thomson Point. On Russell Island, this could be at one or both of Ferry Court and/or Barcelona Terrace.

The existing small centre on Lamb Island would be well located to cater for the convenience needs of residents.

No retail/commercial centres are envisaged on Karragarra Island although a community meeting venue would be appropriate.

The overall island population (even when combined) is not likely to sustain the complete range of services and retail facilities the residents are likely to require. Even though it will be a population which has consciously decided to sacrifice the convenience of the mainland, there will still be a strong reliance on the mainland for goods and services. This will necessitate a reliable around-the-clock transport link to the mainland.

It is unlikely that a secondary school could be justified under this scenario. However, although this would depend on population characteristics, an additional primary school would probably be required on Russell Island.

A greater range of medical services could be sustained.

Environmental Management

Stormwater Management

The full range of stormwater management controls would be adopted within those sensitive catchments which are not considered suitable for lot restructuring (see suggested approach for allotment restructuring in Section 2.5). Where restructuring is proposed, it is anticipated that the need for stormwater management controls would be reduced.

In non-sensitive catchments, all stormwater management would be minimal, involving the use of natural drainageways, and wetlands where practicable.

Vegetation Protection

Vegetation in the medium to low conservation priority areas, together with the high scenic quality areas, would be retained wherever possible through subdivision restructuring. A tree preservation order would be adopted in medium conservation priority areas.

Current practices associated with the clearing of fire breaks would need to be reviewed to encourage the retention of trees.

Sewerage

It is generally intended that reticulated sewerage would be provided to all allotments under 4000 m^2. However, alternative sewerage systems would be considered as part of any restructuring scheme.

Also, alternative sewerage systems could be considered as an interim measure in any largely developed catchment in which on-site effluent disposal systems have created a public health risk.

Transport

This scenario envisages minimal reliance on private transport and the provision of an efficient and reliable community transport system. The establishment of additional passenger ferry nodes at Macleay and Russell Islands would be an important element in the transport system, along with an interlinking pedestrian and bicycle network.

There will still be strong reliance on the mainland for higher order goods and services and employment opportunities. There could also be around 4,000 commuters requiring access to the mainland daily for employment.

Island Specific Issues

Under this scenario, Macleay Island would be expected to experience the highest growth rates, as it is closest to the mainland shopping and employment areas. An upgraded passenger ferry service from the north-western foreshore of Macleay Island to Victoria Point and Cleveland would enhance this Island's attractiveness as a unique dormitory area.

The remaining Islands could be expected to attract a higher proportion of residents with less affiliation to the mainland.

As a result, the range of services and likely recreational needs on these Islands could be expected to differ from those on Macleay Island. For example, Macleay Island would possibly need a wider range of services/facilities to cater for a marginally more rounded community profile.

8.2.2 Scenario 2

Description

Scenario 2 envisages greater levels of development on the Islands, catering for a broader community profile than Scenario 1. Development under this Scenario, ensures there would be a stronger focus on the establishment of neighbourhoods, that is, residential areas focussing on a central community centre. A wider range of retail, commercial and community facilities would be provided on the Islands necessary to support the broader community profile. Services available could potentially cater for almost whole-of-lifecycle needs (eg. schools to retirement villages). There would be a large number of commuters to the mainland for employment.

Development/Settlement Pattern

The existing subdivision pattern would be retained, apart from areas within the very high and high conservation priority areas. As in all scenarios, development would be precluded in the former areas and overall density decreased to one lot per 4,000 m^2 in latter areas. This would involve the restructuring of some 318 allotments to yield 40 lots. This density could be achieved through either clustering of small lots and retaining large areas left undeveloped or more typically be 4,000 m^2 lots with designated 1,000 m^2 building envelopes.

Residential areas would be articulated by vegetation corridors along drainage lines, and have as their focal point a concentration of retail, commercial and/or community uses. These centres would be linked by a network of open space and mobility systems which also provide strong linkages with the foreshore and Moreton Bay.

Under this scenario, land owners would still be encouraged to amalgamate allotments throughout all the residential areas. Possible strategies are discussed in Section 2.5.

Population

Under this scenario the estimated lot yield and population would be as follows:

Table 8.2
Lot Yield and Resident Population - Scenario 2

Island	Number of Lots	Population
Russell	8,319	16,788
Macleay	3,633	7,266
Lamb	775	1,550
Karragarra	258	516
TOTAL	**13,060**	**26,120**

Commercial and Community Services

While some population supporting economic activity would be expected on Russell, Macleay and Lamb Islands, it is likely that this scenario would generate high numbers of commuters to the mainland, potentially up to 8000 per day. Efficient access to the Islands would be a prerequisite for the achievement of this development scenario.

Collectively the Islands would support a hierarchy of retail and commercial facilities with highest order (complementary) centres being located on Russell and Macleay Islands. As a result, there would be less reliance on the mainland for facilities and services.

This scenario is more likely to require one high school (on Russell Island) and up to four primary schools (2 on Russell and Macleay Islands).

A wide range of medical services could be sustained by this population.

Environmental Management

Stormwater Management

This scenario assumes basic stormwater management controls are universally applied across all catchments. This consists primarily of natural drainage and the use of stormwater treatment measures in those catchments where this is warranted.

The full range of erosion and sediment control measures during construction would be instituted and significant improvement to current stormwater quality would be achieved with the road/drainage works.

Vegetation Protection

Tree preservation orders would be placed over the very high and high conservation priority areas. Vegetation protection in the medium to low conservation priority areas would need to be achieved through voluntary programs and modification of Council's fire buffer requirements. Little retention is considered achievable given the size of the allotments.

Sewerage

Reticulated sewerage would be provided to most residential areas. Clustered allotments would also require reticulated sewerage. On-site effluent disposal would be possible on allotments over 4000 m^2.

Transport

This scenario would rely on vastly upgraded public transport connections on both the mainland and on the Islands. Up to 8,000 commuters could be anticipated under ultimate development and assuming current journey to work characteristics. Commuter reducing trends such as tele-commuting, home businesses, etc, may be partially offset by other trends such as the increase in part-time work and lack of available job opportunities on the Islands.

Island Specific Issues

Macleay and Russell Islands would become important centres for the Island population, both offering a range of complementary services and facilities.

Macleay Island in particular would become a commuter suburb of Brisbane, facilitated by the public transport system.

8.2.3 Scenario 3

Description

This scenario has as its focus protection of the natural environment. In this regard, it has many similarities to Scenario 1 (lifestyle) however greater levels of protection are afforded to areas of conservation priority. This scenario provides the greatest range of lifestyle choices, through the provision of urban, park residential and rural residential style allotments. Development density is dictated by conservation significance together with water quality imperatives. Urban density development is concentrated as much as possible to limit the need for expensive infrastructure.

Development/Settlement Pattern

Development is precluded from very high and high conservation areas.

Areas of medium conservation priority rating and of high visual sensitivity not included in higher conservation priority designations, achieve an average density of one dwelling per 4,000 m^2 through a lot restructuring process. This process could deliver clusters of small lots and large undeveloped areas, park residential sized lots or a combination of the both. The overall intention being to reduce disturbance to the vegetation cover in these areas. Water quality imperatives would form the basis of identifying where the development cluster should be located and what site densities could be sustained.

In addition, a buffer zone of up to 100 metres width would be identified adjacent to areas of high and very high conservation priority. The actual width will depend on catchment and vegetation characteristics. Development in this zone would be more spacious to allow vegetation retention and natural stormwater filtration before entering the high and very high conservation

priority areas. An overall dwelling density of one per 4,000 m^2 would also be envisaged in this buffer zone.

Elsewhere there would be no subdivision restructuring, except that required to accommodate stormwater drainage works.

Population and Allotment Yield

The number of lots and population under this scenario would be as follows:

Table 8.3
Lot Yield and Residential Population - Scenario 3

Island	Number of Lots	Population
Russell	6,783	13,566
Macleay	3,513	7,026
Lamb	753	1,506
Karragarra	224	448
TOTAL	**11,273**	**22,546**

Community Services

A wider range of services and facilities could be sustained on the Islands than at present, enabling a higher level of self-reliance to be achieved. The centres strategy outlined in scenario 2 would essentially apply to this development scenario also.

This scenario would provide little emphasis on population supporting economic activity, although provisions would be made for low key tourism development. As a result, this scenario would result in a large number of commuters, estimated at around 6,500.

A central high school on Russell Island would probably be required with this population, although the cost of this would need to be weighed against the cost of subsidising transport to the Victoria Point High School. Three primary schools would be required, two on Russell Island and one on Macleay Island.

As with previous scenarios a wide range of medical facilities could be sustained by this population.

Environmental Management

Stormwater Management

The scenario envisages the full range of stormwater controls across all catchments. This could result in a further slight reduction in allotment yields in those catchments not restructured.

Vegetation Retention

A tree preservation order would apply to all non urban areas across the Islands. Building envelopes would be introduced on allotments of 4000 m^2 and larger, and development clustering encouraged in conservation priority areas and buffer zones.

Sewerage

Sewerage would be required in those catchments or precincts in which restructuring of lots could not be achieved or where restructuring has resulted in clusters of smaller lots.

Alternative on-site schemes could be considered on the 4,000 m^2 lots. Alternative package schemes could also be considered for cluster developments where sufficient on-site disposal area has been retained.

Transport

This scenario envisages minimal reliance on private transport and the provision of an efficient and reliable community transport system. The establishment of an additional passenger ferry node at Macleay and Russell Islands would be an important element in the transport system, along with an interlinking pedestrian and cycle network.

There will still be strong reliance on the mainland for higher order goods and services and employment opportunities.

8.2.4 Scenario 4

Description

This is essentially a 'do little' scenario in the planning sense. Development would be allowed to continue in accordance with the current planning requirements. However, as with all scenarios, a program for the progressive provision of infrastructure would be instituted.

As development occurs and development densities intensify under this scenario, land use conflicts and other deficiencies inherent in the current planning controls will become more pronounced. There will be a progressive transformation from a rural residential lifestyle to a suburban one. This in turn may influence the type of residents moving to the Islands, although in the absence of a bridge to the mainland, the demographics are unlikely to mirror those of the mainland.

Development/Settlement Pattern

This would be dictated by the current planning requirements. Highest priority conservation areas only would be protected along with drainage problem areas. Some minor subdivision restructuring would occur through private owners purchasing and amalgamating allotments, but this would not be on a major scale.

Population

The number of lots and population under this scenario would be as follows:

Table 8.4
Lot Yield and Residential Population - Scenario 4

Island	Number of Lots	Population
Russell	8,642	17,284

Island	Number of Lots	Population
Macleay	3,633	7,266
Lamb	780	1,560
Karragarra	258	516
TOTAL	**13,313**	**26,610**

Commercial and Community Services

There would be no clear hierarchy of centres on the Islands although the existing commercial areas at the transport nodes on Macleay and Russell Islands would develop as the principal centres for all the Islands. Small commercial nodes may eventually establish along the spine roads. This has already occurred on Macleay Island. Without appropriate sites being identified as focal points for community and commercial development within the residential precincts, these precincts will lack a sense of form and neighbourhoods are not likely to develop.

Without a clear planning framework or "ground rules" for commercial development, commercial operators would be reluctant to establish any but the most basic convenience services, for fear of possible future competition. This is in contrast with Scenario 2, in which an unambiguous framework for commercial development would be provided.

There would be strong reliance on the mainland for higher order goods and services as well as health/welfare facilities.

This resultant population would require a high school and perhaps four primary schools, two on Macleay Island and up to three on Russell Island. This scenario would also sustain a wide range of medical facilities and services.

Environmental Management

Stormwater Management

Under this scenario no additional stormwater management measures other than in the general assumptions would be adopted.

Vegetation Protection

No measures for vegetation protection, other than tree preservation controls in areas of very high conservation priority, would be instituted.

Sewerage

Sewerage would be progressively provided across the Islands as development continued. Priority would be given to servicing those catchments which had the highest levels of development.

8.3 Summary of Options and Broad Costings

Table 8.5 provides a summary of the potential lot and population yields of each of the four scenarios. The number of lots that are considered unsuitable for

development and on what basis is also shown in the Table, along with an estimate of likely acquisition costs.

Table 8.5
Preliminary Assessment Lot Acquisition and Cost Implications

Scenario	Total Res A lots	Lots acquired for very high/high conservation	Lots acquired for medium conservation	Lots for stormwater management	Lots lost through amalgamation	Total lots deleted	Total lots developable	Environmental/[1] Amalgamation acquisitions $5500 per lot	Stormwater acquisitions $1000 per lot	Total Acquisitions
Scenario 1										
Russell	9374	716	1734	177	3373	6000	3374	$32,026,500	$177,000	$32,203,500
Macleay	3906	172	181	88	1733	2174	1732	$11,473,000	$88,000	$11,561,000
Lamb	798	21	39	12	363	435	363	$2,326,500	$12,000	$2,338,500
Karragarra	285	17	70	0	99	186	99	$1,023,000	$0	$1,023,000
Total	***14363***	***926***	***2,024***	***277***	***5568***	***8795***	***5568***	***$46,849,000***	***$277,000***	***$47,126,000***
Scenario 2										
Russell	9374	678		177		855	8519	$3,729,000	$177,000	$3,906,000
Macleay	3906	172		88		260	3646	$946,000	$88,000	$1,034,000
Lamb	798	19		12		31	767	$104,500	$12,000	$116,500
Karragarra	285	17		0		17	268	$93,500	$0	$93,500
Total	***14363***	***886***		***277***		***1163***	***13200***	***$4,873,000***	***$277,000***	***$5,150,000***
Scenario 3										
Russell	9374	716	2023	177		2916	6458	$15,064,500	$177,000	$15,241,000
Macleay	3906	172	211	88		471	3435	$2,106,500	$88,000	$2,194,000
Lamb	798	21	45	12		78	720	$363,000	$12,000	$375,000
Karragarra	285	17	82	0		99	186	$544,500	$0	$544,500
Total	***14363***	***926***	***2361***	***277***		***3564***	***10799***	***$18,078,500***	***$277,000***	***$18,355,500***
Scenario 4										
Russell	9374	415		354		769	8605	$2,282,500	$354,000	$2,636,500
Macleay	3906	172		176		348	3558	$946,000	$176,000	$1,122,000
Lamb	798	13		24		37	761	$71,500	$24,000	-$47,500
Karragarra	285	8		0		8	277	$44,000	$0	$44,000
Total	***14363***	***608***		***554***		***1162***	***13201***	***$3,344,000***	***$554,000***	***$3,898,000***

[1]The value of $5,500 per lot is based on 1997 Redland Shire Council purchase prices.

Initial cost estimates to upgrade the roads on the Islands to service the existing 14,363 Residential A zoned lots were of the order of $44M (Redland Shire Council 1997). The cost to provide sewerage to the same lots was estimated at $77M (John Wilson and Partners 1996).

These costs, when factored down on the basis of total population, provide an order of magnitude estimate of servicing costs for the four scenarios. When added to the cost of acquisitions, an estimate of overall development costs can be derived, and these are summarised below in Table 8.6.

Table 8.6
Broad Cost Estimates for the Development Scenarios

Scenario	Services	Acquisitions	Total
1	$46.0M	$47.1M	$93.1M
2	$109.1M	$5.2M	$114.3M
3	$89.3M	$18.4M	$107.7M
4	$109.1M	$3.9M	$113.0M

Note: Service costs include roads and sewerage only

The above table shows that those scenarios with high populations have highest servicing costs and lowest acquisition costs and vice-versa.

More detailed costings of the preferred strategy are discussed in Section 10.3.

8.4 Implementation Strategies

8.4.1 General

The fundamental planning challenge of the Bay Islands is to reduce the number of Residential A allotments and put in place a framework for development which recognises the social, economic and environmental characteristics of the Islands. The allotment sizes, ranging generally between 500-800 square metres, are inconsistent with the vision of island lifestyle that has been derived from the work completed to date. The subdivision pattern has little regard to natural features and has been designed to produce suburban style living, at densities generally higher than most of the Shire's mainland suburbs.

Community input indicated that the Island residents do not want a suburban lifestyle (note the reaction to Council's levy which was construed as being necessary to fund mainland level of services!). Even non-resident landowners indicate that retention of Island character is important to them.

Mindful of the above, the overriding objective in each of the development scenarios is to seek ways to dilute the potential density of development on the Islands.

There are several mechanisms for doing this, some more defensible and equitable than others. These include:

- planning controls which effectively limit the amount of development which can occur, for example by increasing the minimum allotment area for a dwelling to 1,000 m^2;
- environmental controls which preclude or limit development in sensitive areas in an attempt to minimise environmental impact;
- maintenance of a rating system which reflects the true cost of development of the land;
- land acquisition and rezoning to reserve areas for a range of community uses or environmental management measures;
- voluntary amalgamation incentives; and
- land acquisition and subdivision restructuring schemes to produce more appropriate subdivision patterns.

The final development strategy will involve a package of the above mechanisms as further described in Section 10.

Each of these mechanisms and their implications are discussed below.

8.4.2 Planning Controls

Planning Controls can be introduced which restrict the size of dwellings built on an allotment or alternatively set a minimum lot size for development.

Restrictions on Dwelling Size

This is effectively already carried out by Council on the basis of on-site effluent disposal capacity. However, this mechanism is not particularly suited to achieving an overall reduction in density. Ultimately, sewerage is likely to be connected to the Islands and many allotments originally precluded on the basis of having insufficient effluent disposal area would become developable.

Other mechanisms such as the introduction of site coverage or plot ratio controls could only reasonably be introduced if they are designed to minimise tree removal. This is not considered practicable on 500-600 m^2 allotments.

Introduce Minimum Allotment Sizes

Another alternative could be to introduce a minimum allotment size of, say 1,000 m^2 for a dwelling which would force a restructuring of the subdivision. This is likely to have compensation implications.

8.4.3 Acquisition for Environmental Management

Acquisition of allotments on the grounds they are required to protect environmentally sensitive areas or to enable the provision of some stormwater management structure will be necessary.

The question will be: *what proportion of allotments should be acquired in each of the conservation priority areas, or what other mechanisms are available to reduce development in these areas?* Lot restructuring is the obvious one, and is discussed below.

Even if all 3,600 lots in the highest three conservation priority designations are acquired and precluded from development, there will still be sufficient allotments in the remaining precincts to evoke an image of an urban, rather than island, lifestyle.

Clearly on its own, acquisition on environmental grounds is unlikely to deliver the level of development alluded to in the vision.

8.4.4 Acquisition or Rezoning for Non-Residential Uses

Some land will need to be rezoned to provide for settlement supporting uses such as open space, employment generating uses, shops and the like. The extent of land required for such uses will vary with each development scenario.

Rezoning of strategic parcels of land for community and other non-residential land uses together with acquisition of environmental and open space corridors will contribute to the dilution and articulation of the subdivision pattern in residential precincts.

Funding Options for Acquisition Strategies

Local Government is responsible for Island infrastructure, open space and the provision of suitable land for settlement supporting activities.

A contribution toward these services/facilities would normally be provided by the developer, and passed on to landowners in the purchase price of their land.

There would ***appear*** to be an equity question associated with further levy increases on the Islands to cover infrastructure costs.

However, the use of levies to fund infrastructure does offer the following advantages:

- it is likely to increase the number of allotments with no or very marginal development potential coming into Council ownership by default as a result of unpaid rates (this appears to have occurred following the introduction of the Infrastructure Levy); and
- it directs the real cost of the land back to the landowners.

8.4.5 Voluntary Amalgamations

Voluntary amalgamations can also be effective in further reducing overall development density. Overall, around 8% of landowners on the Islands have

purchased 2 or more adjoining allotments. The proportion appears highest on Lamb Island at around 11-12%.

Some 83% of multiple lot holdings have an area of 1,000 - 2,000 m^2 typically, comprising two allotments generally around 1,200 to 1,500 m^2.

Strategies which encourage the purchase and amalgamation of two or more allotments would be particularly applicable in those areas of low conservation priority or environmental significance in which there are insufficient grounds for acquisition. There is clearly a preference (or ability) to purchase only two allotments, amalgamation of which still fails to produce a subdivision pattern which is conducive to environmental protection.

Amalgamation of multiple lot holdings should continue to be encouraged by Council through the rates system and through waiving subdivision fees.

Land owners should be encouraged and given assistance to purchase adjoining lots. Possible assistance could be in the form of:

- the provision of low interest loans funded by either local or state government;
- an advisory service which helps landowners make contact with neighbours and which acts as an agent for the land transfer process; and
- provision of a valuation service which establishes fair market value for allotments.

8.4.6 Subdivision Restructuring

Subdivision restructuring schemes have the potential to alter the ultimate residential density on the Islands, but clearly they would involve substantial levels of capital.

Essentially, restructuring involves the joining together of two or more small blocks of land into one larger block. This larger block can then be resubdivided into more appropriate size allotments.

Restructuring schemes have been used quite extensively in parts of Victoria and Western Australia. In the Victorian context, they have been used to reduce development potential in areas of environmental sensitivity or remote from urban infrastructure. These were prevalent in the early 1980s in areas such as the Mornington Peninsular and the Dandenong and Yarra Ranges. They are more often used to unlock infill sites in the Western Australian context.

The schemes can operate in two ways:

i) Land owners participate in the scheme and maintain equity equal to the proportion of their land in the scheme. Any returns from the sale of the final allotments are apportioned to landowners on the basis of the equity.

ii) An authority can acquire the land and undertake a restructuring scheme, hopefully recouping the costs of the scheme from the ultimate sale of blocks.

A fundamental principle in both these approaches is that the equity returns must be greater than the englobo value of the site. Mechanisms which limit (or even devalue) the englobo value of the land, such as stringent planning controls, high rates etc. can be important to the success of such schemes.

Another fundamental principle is that these schemes need to be 'sold' to the community as a means of salvaging some value in the land in the future.

These schemes are not especially popular. They are very cumbersome and complex, and would probably need to have enabling legislation. WA has provisions for "Guided Development Schemes" in its planning legislation, which enables, with justification by Council to the Minister, such restructuring schemes to occur.

Application to the Bay Islands

Subdivision restructure schemes could be applied to the Islands through the following process:

- The Planning Study could identify 'declared precincts' which would be candidates for subdivision restriction.
- The 'end state' subdivision pattern would be established having regard to service availability (ultimate), conservation priority rating, visual sensitivity and water quality imperatives.
- Land owners could be invited to either participate in the scheme or Council would acquire their property at current market value (which would have been effected by a package of other measures previously introduced). Purchase price would also cover capital improvements.
- Council could project manage the restructuring scheme. An alternative may be the establishment of a State body (Island Restructuring Authority) which would project manage and fund the scheme. Private developers may also be interested if one or two pilot projects prove successful.
- Candidate precincts for restructuring would be selected on the basis of:
  - current level of development,
  - conservation/environmental management priority,
  - strategic location of the precinct,
- The precincts would be allocated a development priority which ties in with Council's infrastructure program. Only one restructuring scheme per Island would be carried out at a time.
- Allotments with dwellings would be excluded from the restructuring scheme.
- Restructuring schemes would be most applicable for those precincts in which the end state allotment sizes were in excess of 2,000 m^2. Planning controls and rate incentives would be used to encourage amalgamations to

achieve smaller lots. This is based on the notion that there needs to be a sound basis for carrying out a restructure (environmental or lifestyle) and the achievement of 1,000 m^2 lots is not an outcome which could deliver the desired benefits.

9. Evaluation of Scenarios

9.1 Criteria Based Evaluation

An initial evaluation of the four development scenarios was based on a number of broadly quantifiable, environmental, social and economic criteria. These are listed in Table 9.1 below, along with their measures or ratings under each scenario.

Table 9.1
Evaluation Criteria and Measures for each Scenario

Criteria	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Criterion 1 Mean urban lot area (m^2/lot)	1,375	894	1,032	877
Criterion 2 Mean urban lot area in high and medium conservation priority areas (m^2/lot))	2,240	671	4,473	609
Criterion 3 Number of catchments within nutrient export benchmarks (No.)	38	23	24	20
Criterion 4 Number of catchments within nutrient export benchmarks by > 50% (No.)	69	53	56	50
Criterion 5 Population exposed to mosquitos (= final population on Islands) (Persons)	11,136	26,400	21,598	26,402
Criterion 6 Road costs, School subsidy costs[1], School Capital costs and Acquisition costs ($)	151	82	99	80
Criterion 7 Commercial floorspace sustainable (Ranking from 1 - 4)[2]	4	1	3	2
Criterion 8 Area of business/industry land (ha)[3]	95	156	135	156
Criterion 9 Number of commuters (Persons)	4,000	8,000	6,500	8,000

[1]Based on $126/head/year

[2]Ranking 4 = greatest % of floorspace sustainable

1 = lowest % of floorspace sustainable

[3]Based on 6 ha/1000 residents

These criteria were specifically adopted as they allowed some level of quantitative assessment. It is accepted that there would be a host of other less quantifiable criteria that could also have been added to the evaluation process. However, it was considered that the selected criteria adequately covered the necessary range of issues at this level of analysis.

The measures and ratings of criterion for each scenario was based on data generated from modelling, GIS and population analysis. All of the data has been previously described in documentation supplied to the steering committee.

Weightings were then applied to each criterion in order to examine how each scenario performed given different emphasis on social, economic or ecological factors. In essence, this was a sensitivity analysis. The weightings were adjusted as follows:

- social emphasis (high weightings for commercial and employment generation);
- economic emphasis (high weightings for costs and water based transport demands); and
- ecological emphasis (high weightings for larger allotment areas, and retention of conservation priority land).

A further analysis was carried out with the weightings balanced across the three classifications. That is, the total value of the weightings for each classification was equalised.

Nutrient exports were effectively classed as an economic factor, because the criteria represents the number of catchments which require additional water pollution controls to achieve nominated export rates.

Mosquito and midge exposure was related to ultimate population on the Islands. This was both a social and economic criterion, because the health impacts will be at least partially reflected in mosquito control and human health costs. The weighting for this factor was the same in each analysis.

Table 9.2 shows the weightings applied to each analysis.

Table 9.2
Adopted Weightings for Scenario Evaluation

Criterion	Weighting Emphasis			
	Balanced	**Social**	**Ecological**	**Economic**
1. Mean lot size	2	1	3	1
2. Area of conservation land retained	2	1	2	1
3. Catchments with low nutrient export	2	1	2	1
4. Catchments with "moderate" nutrient export	2	1	2	1
5. Population exposed to midges and mosquitoes	2	2	2	2
6. Infrastructure and acquisition costs	8	6	6	10
7. Amount of sustainable commercial use	4	5	1	1
8. Employment generation opportunities	4	5	1	1
9. Demands on water-based transport	2	1	3	1

The balanced weightings analysis revealed that Scenario 3 was the most positive (ie. scored highest), followed by Scenario 1. The same pattern

occurred when social factors were weighted higher. Scenario 1 followed by Scenario 3 was the order which occurred with ecological emphasis.

Scenario 3 rated the highest when economic factors were emphasised, followed by Scenario 4. The high acquisition costs of Scenario 1 made it least attractive in that particular analysis.

Overall, Scenario 3 was the most robust in the sensitivity analysis. The analysis which emphasised economic factors could be reweighted to favour least cost options (scenarios 2 and 4), but this involved setting ecological weights at zero. Obviously, using such low weightings would not reflect community views. In other words, Scenario 3 and to a lesser extent Scenario 1 appeared to the best meet the development principles for the Islands.

Implications for Strategy Development

This evaluation was not designed as the sole basis for selecting the preferred development strategy of the Islands, which is likely to comprise a differing mix of the elements of each scenario for each Island. However, the analysis does suggest that the preferred strategy of each Island should contain many of the elements of Scenario 3 and possibly Scenario 1.

It is re-emphasised that the potentially high costs associated with implementing some of the elements of Scenario 1 (notably lot restructuring) weighed heavily against it.

9.2 Evaluation based on Community Input

The second component in the scenario evaluation was based on input from the Island Summit and the analysis of responses to Newsletter 4.

Community input from both of these sources assisted to identify those scenario elements and development principles which should be incorporated in a preferred strategy for each Island.

9.2.1 Island Summit

(i) Mainland Forum

The mainland forum was held at the Victoria Point community hall on Friday 31 October 1997. Some 87 landowners recorded their attendance at the forum.

The group raised a range of issues and concerns and there was strong (although not unanimous) support for a bridge link to Russell Island. The issues raised could be grouped as follows:

(i) Transport

- Ferries do not provide after hours transport.
- Bridge required in view of commuter numbers.
- Bridge would not affect development principles.
- Regardless of whether or not there is a bridge, there will still need to be employment-generating areas provided in the Redland Shire (the absence of such areas is not an adequate argument for not providing a bridge).
- Have the environmental costs of water-based transport been properly assessed?
- Lack of a bridge is the reason why relatively few people have built on the Islands.

(ii) Development

- Need to achieve different lot sizes across the Islands.
- 1000 m^2 lots would be inequitable, who determines who can build and who cannot?
- Many older people cannot afford or do not wish to maintain a larger size lot. Anyway, smaller lots are being provided on the mainland.
- Island not just for yuppies.
- How can the community decide on what is the best development outcome if full cost implications cannot be identified?

(iii) Environment

- Agree that highest conservation priority areas should be protected.
- Mapping used to determine conservation areas is out of date.
- People who cannot build because of conservation should be compensated (or lots acquired) sooner rather than "long term objective."

(iv) Rates

- Rates are too high for the level of service being received.
- Rates should pay for mainland level of services, although such services are not generally welcomed.

(v) Process

- Will the Council listen to the wants of the people?
- Who will decide on the appropriate development for the Islands?

Key Issues

The mainland summit highlighted two related planning themes which were put forward (primarily by non-residents):

- lack of road access to the Island is a major factor in depressing land values and in preventing some people from settling there; and
- some people purchased property specifically because the allotments were small and affordable - hence forced amalgamations would be strongly resisted.

The mainland summit indicated there are many in the community that hold the belief that Russell Island is already a suburb that is just waiting for the bridge and appropriate level of infrastructure to "finish it off".

The arguments put forward to suggest that a mainland type suburb in the middle of Moreton Bay would be "environmentally challenging" did not seem to outweigh the perception that a major social injustice had been perpetrated on the Island landowners. A bridge is still perceived by many to be the only way this injustice can be remedied.

It should be noted that there was general agreement with the Image and Principles presented, apart from that relating to water-based transport.

(ii) Island Forum

An all day summit was held on Saturday 1 November 1997, at the Russell Island Community Hall and approximately 210 people attended the meeting. A summary of the major issues raised at the Island Summit is provided below.

Points on Which Consensus was Achieved

A. Common Assumptions

- Sewerage was generally accepted although there remains some interest in some on-site systems for small lots.
- Spine roads should have some passing opportunities (or be 7-8 metres wide).
- 3.5 metre roads adequate on smaller Islands but perhaps need to be 4.5-5.0 metres on the larger islands. All agreed mainland style roads not acceptable.
- Protect all high and very high priority conservation areas plus other vegetation on smaller Islands.
- Should stop charging rates on those blocks identified for acquisition as soon as practicable.
- Further development of water-based transport supported between Islands as well as to the mainland.

- Occupancy rate of 2 people per dwelling agreed, although planning should recognise there will be a range of household types on the Islands.
- Bridge to Russell Island, either in the short term or long term was strongly supported. Overwhelming feeling was "How could Russell Island cope without a bridge?"
- Each Island should be treated differently.

B. Other Areas of Consensus

- Agreed on natural stormwater drainage and need to acquire affected lots.
- Agreed to need for on-island transport and lower reliance on private transport.
- Agreement with stormwater management strategies, providing affected landowners are compensated.
- Agreed that mosquitos and midges will not influence residential location.
- Agreed that development should be restricted to areas above RL 2.4 metres, although some maintain that fill below this level should be considered if no environmental impacts.
- The Islands' unique lifestyle qualities must be protected. However, these will differ between the Islands.
- The need for acquisition of lots precluded from development on the basis of conservation priority, although it was felt this should be short-term not long-term.
- The need for further consultation before the strategy is adopted.
- The need for more community services on the Islands.

Points on which no Consensus was Reached

- The need for a bridge to Russell Island.
- The styles of development appropriate on Russell Island.
- The ability of the water-based transport system to accommodate population growth.
- The Image of development as it applies to Russell Island.

9.2.2 Response Sheets - Newsletter No. 4

Approximately 875 response sheets were returned to the study team for analysis. The breakdown of responses by Island is as follows:

Russell	59%
Macleay	30%
Lamb	8%
Karragarra	3%

The major findings from an analysis of these response are detailed below.

Island Image/Vision Statement

The following table summarises the response by owners of land on each Island to the Image outlined in Newsletter No. 4.

Table 9.3

	Russell		Macleay		Lamb		Karragarra	
	No.	%	No.	%	No.	%	No.	%
Agree	366	70	200	76	48	72	20	83
Disagree	89	18	31	12	4	6	1	4
No Comment	66	12	32	12	15	22	3	13

Figure 7 graphically depicts the result which suggests broad overall support for the image.

Development Principles

The following table summarises the response to each of the key land use principles formulated to support this Image.

Table 9.4
Number of Responses Supporting Principle for Each Island

Principle	Russell	Macleay	Lamb	Karragarra	Total Number of Respondents Supporting Principles	
1. Lifestyle	549	519	330	313	792	90.5%
2. Land Use	627	534	452	435	812	92.8%
3. Community	588	426	329	308	736	84.1%
4. Access	579	499	397	379	804	91.8%
5. Environment	651	449	387	375	812	92.8%
6. Utilities	604	598	412	394	738	84.3%
7. Open Space	574	458	351	332	740	84.5%
8. Tourism	475	421	322	202	817	93.3%
Mean	**581**	**463**	**372**	**342**		

The above figures indicate overall high levels of support for the development principles. While the numbers appear relatively low for Lamb and Karragarra Islands, it should be noted that only 10% of the total number of responses came from landowners on these two Islands.

The right hand column indicates that the lowest level of support (still 84.1% of respondents) was for Principle 3 which was:

> *The emergence of socially cohesive communities will be promoted and supported by a range of services and facilities which provide a higher level of self reliance.*

The marginally lower response for this could be explained by the nature of the principle, the concept of which is perhaps most difficult to visualise. However, this explanation could not apply to the next lowest rating principle, Principle 7 which was:

> *There should be enhanced public access to public open space and recreation facilities.*

The perceived abundance of open space presently on the Islands may have influenced this outcome.

There was overall strongest support for tourism on the Islands (Principle 8), although respondents were quite selective in terms of the Islands to which this should apply.

The number of responses to the principles for each of the four Islands have been ranked to better enable comparison between the Islands. The rankings are shown in the following table.

Table 9.5
Ranking of Response by Island

Principle	Russell	Macleay	Lamb	Karragarra
1. Lifestyle	7	8	6	6
2. Land Use	2	1	1	1
3. Community	4	6	7	7
4. Access	5	2	3	3
5. Environment	1	5	4	4
6. Utilities	3	3	2	2
7. Open Space	6	4	5	5
8. Tourism	8	7	8	8

Note 1 = greatest number of responses

The above table indicates those principles which should be given greater or lesser weight on each of the Islands. Clearly, there was stronger support across all Islands for Principle 2, that land use and development be consistent with the individual character of each island and responsive to the environment.

There was also stronger support for the principle related to access and water-based transport, although Russell Island rated lowest in this regard, a clear reflection of the bridge issue.

Interestingly, the principle relating to lifestyle ranked relatively low across all Islands, and lowest on Macleay Island. However, overall this principle received strong support by 90.5% of respondents. The reason for this apparent

anomaly is that fewer respondents felt this principle should apply to all Islands, and were subsequently more selective in their application of this principle across the Islands.

The same explanation holds for Principle 8. Whilst the largest number of respondents agreed with it, relatively few thought it should apply across all Islands.

Development Policies

A summary of the overall response provided to each of the planning principals and accompanying policies is provided below.

Principle 1: Lifestyle

- There was lowest support for the policy to promote greater public transport, particularly on the large Islands.
- There was also lower support for the idea of providing further facilities on the Islands.
- Strongest support came for controlling foreshore development on all Islands and retaining the unique lifestyle.

Principle 2: Land Use

- There was strongest support for those policies associated with protecting the environment, controlling development in hazardous areas and encouraging development which reflected each Island's characteristics.
- There was lower support for amending the subdivision pattern to achieve improved balance between development and conservation.

Principle 3: Community

- Stronger support for the creation of centres and focusing of facilities.
- Lower support for the establishment of employment opportunities on all Islands.

Principle 4: Access

- There is consistently strong support for all policies across all Islands related to transport provision.
- There was lowest support for more jetties on Lamb and Karragarra Island, which can be attributed to the nature of the question.

Principle 5: Environment

- Overall strong support across all the Islands for environmental management.
- Management of stormwater and establishing riparian corridors received strongest support on Russell and Macleay Islands.
- Protecting native flora and fauna and controlling development in sensitive areas received strongest support on Lamb and Karragarra Islands.

Principle 6: Utilities

- Lowest support for Island sensitive roads on Russell Island, but highest levels of support for this policy on all other islands.
- Relatively higher support for minimising visual impact of services across all Islands.
- Lower support for alternative on-site effluent systems on Russell and Macleay Islands, but stronger support for this on the two smaller Islands.

Principle 7: Open Space

- Strong support across the Islands for the policies encouraging access to and availability of open space.

Principle 8: Tourism

- Relatively strong support for tourism related policies for Russell Island.
- Reasonably strong support on Macleay Island.
- Relatively lower levels of support for tourism on the smaller Islands.
- The lowest overall response for any principle on any Island was that supporting the policy for increased daytrippers and recreational boating on Karragarra Island.

9.2.3 Comparative Analysis

A comparison was subsequently made between the outcomes from the Summit and findings from Newsletter responses to establish the level of consistency between the two sources of input. The results are summarised below in Table 9.6. The left column lists the key outcomes from the Summit, the right lists those general principles and more specific policies for which greatest levels of support were recorded on each Island.

Table 9.6
Comparison of Outcomes from Island Summit and Response to Newsletter 4

Summit Outcomes	Survey Responses (Strongest Support)
General Principles • The need to protect those areas having high and very high conservation priority. • The need to adopt natural stormwater management solutions. • Whilst there was some support for a minimum lot size of 1000m^2, this was not considered equitable or achievable and wholesale amalgamations should not be made mandatory. • The need to restrict development below RL2.4 metres and improve access to the foreshore. • Scenarios which generate high numbers of commuters are not likely to be compatible with the image of island lifestyle supported and a water based transport solution. • Further water transport access points should be a component of any preferred strategy for Russell and Macleay Islands. • Non-mainland standard roads should be adopted.	• Development should reflect individual character of each Island and be responsive to the natural environment and unique setting of the Islands within the Marine Park (92.8%). • Adopt a holistic approach to environmental management which provides protection for areas of environmental and cultural significance and which is sustainable (92.8%). • Encourage low key tourism and recreational boating on Russell, Macleay and Lamb Islands consistent with the Marine Park setting (93.3%).
Island Specific Principles *Russell* • The strategy should enable a range of lot sizes and should not penalise those who have lots under 1000m^2. • The island should be developed as neighbourhoods delineated by open space and environmental corridors. • A range of shops and services to serve the Island's population should be encouraged.	• Control development in areas of environmental hazard (70.5%). • Control foreshore development (66.2%). • Concentrate shops and facilities to create centres (69.5%). • Promote water-based access (67.7%). • Minimise visual impact of services (62.1%). • Provide open space/cycle network (67%). • Provide public boat moorings (63.7%).
Macleay • Because of the relative lack of high and very high conservation priority conservation areas, medium priority areas should be afforded some level of protection. • Lot amalgamations should be strongly encouraged across the island, but particularly in the medium and low conservation priorities areas. Mandatory controls in these latter areas could be considered. • Foreshore protection should be improved.	• Improve foreshore access (53.4%). • Control development in areas of environmental hazard (56.8%). • Concentrate shops and facilities to create centres (53.6%). • Provide more jetties on Macleay and Russell Island (58.5%). • Re-establish riparian corridors (59.8%).

Summit Outcomes	Survey Responses (Strongest Support)
• A range of shops and services to serve the needs of the Island population should be encouraged.	• Provide Island sensitive roads (53.5%). • Provide foreshore open space and facilities (56.8%). • Promote eco-tourism (46.6%).
Lamb and Karragarra Islands • Foreshore protection and access should be improved. • All vegetation should be protected, not just the high and very high conservation areas. • Lot amalgamations should be strongly encouraged. • Provide some limited shopping facilities on Lamb Island, but none on Karragarra Island.	• Reduce development potential in sensitive areas (Lamb 46.1%, Karra 45.8%). • Concentrate shops and facilities to create centres (Lamb 37.8%, Karra 34.3%). • Promote water based transport (Lamb 43.8%, Karra 41.4%). • Protect and promote native flora and fauna (Lamb 49.3%, Karra 46.4%). • Provide Island-sensitive roads (Lamb 40.7%, Karra 38.5%). • Provide foreshore open space and facilities (Lamb 41.4%, Karra 39.5%). • Promote ecotourism (Lamb 36.2%, Karra 32.9%).

Note: While the percentage of responses for Lamb and Karragarra Islands appear relatively low, they should be seen in the context of the low proportion of responses received from these two Islands (Lamb 8% and Karragarra 3%). The figures actually suggest high levels for support for the principles and policies

Implications for Strategy Development

Comparing the two columns, there is clearly considerable consistency between the key outcomes from the Summit and the analysis of responses from Newsletter 4. There is strong support for a development strategy which offers high levels of protection of the Island environment and which offers a framework for the location of services and facilities, particularly on the larger Islands. These findings also indicate a preference to the key elements of Scenario 3.

Strategies which address the need to protect the foreshores and promote access to them are also seen as important, as is the need to provide servicing solutions which suite the specific needs of the Islands.

10. Recommendations for Preferred Strategy

10.1 Recommendations

Based on the findings presented in the preceding sections of this report, the following recommendations are made in relation to the future development of the Southern Moreton Bay Islands Strategies flowing from these recommendations are presented in the separate Draft Strategy document.

A. Development

Recommendations are as follows:

- The nature of development on the Islands should be consistent with the stated Island image and should offer an alternative lifestyle and character to that available in the metropolitan area.
- Measures should be introduced to encourage building forms and styles that reflect this unique lifestyle and set the Islands apart from suburbia.
- The existing subdivision pattern will generally need to be retained on those parts of the Island not assessed as having conservative value, constrained by poor drainage, or which provide opportunities for significant savings to be made in infrastructure provision.
- Nonetheless, incentives should be considered for amalgamation of lots to enable greater vegetation retention, provide for a more spacious settlement pattern and lower overall population density on the Islands.
- The subdivision pattern should be articulated by the use of open space and vegetation corridors to provide identifiable physical precincts. Such precincts will act to reinforce "sense of community" across the Islands and give improved legibility to the settlement pattern.
- Development intents for each of these precincts should be established to give guidance to the range of uses and management protection required in each precinct.
- Provision should be made in each of these precincts for the provision of appropriate settlement support facilities such as shops, parks, community meeting places, employment generating activities.
- Retention of the existing subdivision pattern will ultimately require the introduction of reticulated sewerage together with measures to reduce the quantity and improve the quality of stormwater runoff.

B. Human Services

Recommendations are as follows:

- A human services strategy should be prepared to address the need for a range of community facilities and services on the Islands. This strategy should rely heavily on the concept of shared/multi use facilities, and include the entire Island group as the service catchment.
- Community interest and involvement in the provision of services should continue to be encouraged as a way to meet shortfalls in the provision of services/facilities and foster a sense of community.

C. Environmental Management

Recommendations are as follows:

- Areas identified which have been assessed as having important ecological and biological functions, and the protection of which would play a significant role in the sustainability of the Islands and marine environment, have been given a high and very high conservation priority. No further development should occur within these areas.
- Due to the contribution medium conservation priority areas make to the ecological processes and the landscape setting on Macleay and Lamb Islands, these areas too should be protected and precluded from development.
- Medium conservation priority areas in the southern part of Russell Island should be protected through either acquisition to preclude development or through the restructuring of allotments to provide a minimum lot size of 6,000 square metres. These areas not only provide relatively large tracks of vegetation and habitat, they are also sparsely developed and provide opportunity to make significant savings in future infrastructure provision and reductions to the ultimate population. An added benefit would be to preserve this area's cultural heritage values.
- The medium conservation areas elsewhere on Russell Island provide buffers between what will be the most densely developed areas of the Island and conservation/drainage corridors. These areas should also be precluded from development.
- Stormwater management controls will need to be introduced to protect the quality of surface water discharges to freshwater wetlands and the marine environment. These should include the use of natural drainage lines to increase absorption and filtration of stormwater, buffer areas, retarding basins, sediment control structures and the use of wetlands for final water treatment. Acquisitions to reduce development density should also be considered as a management strategy for stormwater.

- Measures should be adopted to protect the foreshore areas from over development and to preserve the biological and landscape values of the foreshore (including tidal) vegetation.

D. Drainage Constrained Land

Recommendations are as follows:

- All lots identified as being significantly affected by stormwater or potential tidal inundation should be precluded from development.
- All such lots should ultimately be acquired. Priority should be given to lots in drainage categories 5 and 8. Other acquisition priorities should be based on whether allotments would functionally contribute to the open space network.

E. Transport

Recommendations are as follows:

- The strategy should be based on an improved water based transport system. Investigation should continue as to the most effective ways to upgrade the water transport system to provide longer hours of service and increased overall capacity.
- The environmental implications of the water based transport network will need to be continually monitored and subject to appropriate environmental safeguards.
- Provision should be made for further water access points on the Islands (particularly Russell and Macleay).
- Establishment of alternative routes between the Islands and the mainlands should be investigated and appropriate onshore facilities provided for.

Strategies to increase the provision and use of public transport both on the Islands and the mainland need to be developed in order to reduce the overall reliance on private motor vehicles on the Islands.

10.2 Allotment and Population Yields

Adoption of the above recommendations relating to development and environmental management would result in the following number of developable allotments and ultimate population.

Table 10.1
Yields

	Lots	Population
Russell	6,527	13,054
Macleay	3,756	7,512
Lamb	775	1,550
Karragarra	290	580
Total	11,348	22,696

10.3 Development Costs

10.3.1 Infrastructure

The overall cost of providing sewerage, roads and stormwater management infrastructure to support the preferred development strategy is estimated at around $105M. These are listed in Table 10.2. These costs include necessary acquisitions for stormwater conveyance, stormwater treatment structures and for extensions of open space corridors.

The cost of providing human services also need to be considered. These would include police and emergency services, health and welfare services and education facilities. Education facilities are likely to be the most significant and an estimate of facility and transport subsidy costs has also been included in Table 10.2.

10.3.2 Land Acquisitions

The Strategy costs would be considerably higher if the lots recommended to be precluded from development are acquired. Table 10.3 provides a summary of these lots together with an estimate of the overall cost of their acquisition. The assumed acquisition prices for developable lots in conservation areas is $5,500. Land values on the Island vary widely depending upon proximity to the foreshore, views, site condition and other real estate variables. Blocks on the waters edge in prime locations cost up to $70,000-$100,000, whereas lowlying blocks in the centre of the Islands could be purchased for between $5,000 and $10,000. Blocks designated as drainage problem have a nominal value of $500, however an acquisition cost of $1,000/lot has been assumed to cover the cost of legal administration.

Recent valuations issued in March 1998 indicated that, in general, land values on the Islands had fallen markedly over the past 12 months. These valuations possibly reflect the levels of uncertainty that remain in the community together

with the impact of the earlier proposed Infrastructure Levy. In view of these recent valuations, the above mentioned land values, which represent recent sales of "marketable" lots, may be high in present terms, but have been retained to allow for any increase in value that may occur prior to acquisitions taking affect.

Whilst the cost of acquisitions would be high, it would be less expensive to acquire lots (up to a value of around $8,500 to $10,000/lot) then to provide services to them. There would also be no ongoing operation and maintenance costs.

The acquisition of these lots is ultimately desirable to ensure appropriate management and protection of these areas. Any acquisition program should give priority to lots which are most critical to the implementation of the strategy.

There would be high expectations from the community that some compensation would be forthcoming for loss of development rights of these lots, regardless of whether or not compensation was legally claimable. The issue of compensation is further discussed below.

10.3.3 Compensation Implications

The new *Integrated Planning Act* (IPA) takes a different approach to compensation than is the case under the current Act. Section 5.4.2 of IPA states that compensation is payable where a change to a planning scheme or planning scheme policy has the affect of reducing the value of an **interest in land** and the owner has made a *transitional* development application in respect to that land which has been refused or subjected to conditions. Unlike the P&E Act, under which compensation is claimable on any change in value due to the affect of a planning scheme, IPA requires a development application to be lodged to trigger the compensation provisions.

Compensation is payable under 5.4.2 if there is a substantial reduction in achievable yield. This differs from the current legislation under which **good neighbour** development requirements, which may have had the effect of reducing the overall site yield, were **not** compensatable.

Any amendments to the planning instruments which limit development potential due to flooding or inundation would appear to be compensatable if these amendments result in a diminished market value.

Applicants have 2 years from the time of adoption of the new planning scheme to lodge a transitional application. After this time it would appear that all compensation rights under Section 5.4.2 expire. Council can decide to assess an application under the existing planning scheme and avoid possible compensation claims. Alternatively, it can deal with applications under the new provisions and argue there has been no reduction in market value, because the land use was constrained prior to the new scheme. Section 5.4.9 provides for this latter scenario as illustrated below.

An interesting situation would arise if the new planning instrument changing the designation of a lot lowered its apparent market value, but in reality, did not affect the extent of development possible on the site. A case in point would be where the drainage constrained lot "overlay" reduced the ability of affected landowners to sell, and therefore reduced the lots market value. The lot was always constrained by drainage, but the fact this is formally documented may reduce its value.

Section 5.4.9 of IPA appears to allow for such eventualities. It effectively states that the initial compensation figure, representing the difference between the market value of the interest in land immediately before the change came into effect and the market value after the change came into affect can be adjusted on a number of grounds including the following:

- to consider reasonable limitations or conditions that may have applied to the land had it been developed under the superseded planning scheme;

Table 10.2
Summary of Development Costs

	Unit Cost	Russell		Macleay		Lamb		Karragarra		Totals
		Lots	Cost	Lots	Cost	Lots	Cost	Lots	Cost	
Capital Works Costs										
Acquisitions for Stormwater Treatment	$10,000	22	$220,000	8	$80,000	2	$20,000			$320,000
Required for Stormwater Conveyance	$5,500	10	$55,000	3	$16,500					$71,500
Open Space:										
Lots acquired for OS Linkage	$5,500			15	$82,500					$82,500
	Cost/Catchment	*Catchments*		*Catchments*		*Catchments*				
Stormwater Treatment[1] (minor)	$100,000	10	$1,000,000	19	$1,900,000	7	$700,000			$3,600,000
(major)	$250,000	1	$250,000	5	$1,250,000					$1,500,000
Marine Structures										$2,700,000
Sewerage Reticulation			$24,800,000		$14,900,000		$4,100,000		$2,000,000	$45,800,000
Treatment/Disposal										$17,700,000
Roads:		*kms*		*kms*		*kms*		*kms*		
Bitumen	$390/lineal metre	16.1	$6,279,000	18.1	$7,059,000	1.8	$702,000	0	0	$14,040,000
Concrete	$230/lineal metre	58.6	$13,478,000	28.2	$6,486,000	6.1	$1,403,000	2.6	$598,000	$21,965,000
Schools (Primary)										$6,000,000
Transport Subsidy: (Secondary)										$1,500,000
(Primary)										$700,000
TOTAL COST										**$115,979,000**

1. Several structures may be required in each catchment and this has been reflected in the costs.

Table 10.3
Summary of Acquisition Costs

Type of Land	Unit Cost	Russell		Macleay		Lamb		Karragarra		Totals
		Lots	Cost	Lots	Cost	Lots	Cost	Lots	Cost	
Drainage Constrained:										
Flood Effected Lots*(Cat1)*	$1,000	327	$327,000	163	$163,000	11	$11,000	1	$1,000	$502,000
(Categories 5&8)	$5,500	10	$55,000	4	$22,000					$77,000
Existing DP Lots1[1]	$1,000	1422	$1,422,000	189	$189,000	85	$85,000	3	$3,000	$1,699,000
										$2,278,000
Conservation Lands[2]										
Very High	$5,500	418	$2,299,000	128	$704,000	14	$77,000	7	$38,500	$3,118,500
High	$5,500	300	$1,650,000		-	8	$44,000	9	$49,500	$1,743,500
Medium	$5,500	2120	$11,660,000	242	$1,331,000	34	$247,500			$13,238,500
TOTAL COST			**$17,431,000**		**$2,409,000**		**$464,500**		**$92,000**	**$20,378,500[3]**

[1] Includes lots in DP Categories 3 and 4 but excludes those lots already owned by Council.

[2] Number of lots exclude those already precluded from development due to drainage constraints.

[3] These figures include lots with existing dwellings. There are approximately 64 lots in these categories with dwellings on Russell Island, 25 on Macleay Island, 4 on Lamb Island and 7 on Karragarra Island. As lots with approved buildings and current building approval are not intended for acquisition, the above total acquisition price could be reduced by $550,000 to $19.8M. The number of dwellings is approximate only, and no estimate has been made of the number of current building approvals on lots in these categories for each Island.

- the effect of the value of the land of any under benefits resulting from the changed scheme;
- the positive effect the change to the planning scheme on other adjacent land owned by the claimant.

Owners of land which, through the action of a new planning scheme, can only be used for some public use also have 2 years to claim compensation.

Section 5.4.4 outlines limitations on compensation. These are of particular relevance to the proposed environmental protection strategies, especially paragraph h(ii) which states:

> *"….. compensation is not payable if the change … affects development that, had it happened under the superseded planning scheme would have caused serious environmental harm as defined in the Environmental Protection Act."*

Section 17(1) of the EPA defines serious environmental harm as environmental harm (other than environmental nuisance):

(a) that causes actual or potential harm to environmental values that is irreversible or widespread; or

(b) that causes actual or potential harm to environmental values of an area of high conservation value or special significance; or

(c) that causes actual or potential loss or damage to property of an amount of, or amounts totalling, more than the threshold amount;

(d) that results in costs of more than the threshold amount being incurred in taking appropriate action to:

(i) prevent or minimise the harm; and

(ii) rehabilitate or restore the environment to its condition before the harm.

Conclusion

It appears that the introduction of IPA will benefit the implementation of the proposed strategy by removing any compensation rights on land rezoned for environmental protection. Whether or not this would extend to medium conservation priority areas is, however, uncertain.

Where development interests have been reduced in other circumstances, compensation *will* be payable, although the process must be triggered by a transitional development application and potential claimants have only 2 years to lodge such an application. This would not seem to apply to lots identified as having drainage constraints since current planning provisions require notification of conditions and compliance with performance standards. One of these requires all development to be above Q100.

Regardless of the legal requirements, there is a strong moral obligation to acquire affected lots (at least at current market value) rather than extinguish development rights without any recognition of landowners' past contributions to Redland's rate base.