Redland Shire Council
Queensland Department of Local Government and Planning

Southern Moreton Bay Islands Planning Study

Report On

Planning and Land Use Strategy

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Preface

Moreton Bay is a magnificent natural feature and one of Queensland's most important ecological, recreational, cultural and economic resources. This significance was formally recognised in 1993 when the Bay received Marine Park status.

The Southern Bay Islands are an integral part of Moreton Bay's environment and character. They provide a green backdrop to the Bay and habitat to a wide variety of land and intertidal plant and animal species. In this regard alone, the Islands have regional and national significance. Importantly, the Islands also provide a rare opportunity to enjoy a relaxed island lifestyle within commuting distance of Australia's third largest metropolitan area. Broad community support was demonstrated for the protection of this lifestyle opportunity.

However, the subdivision pattern that now exists on the Islands puts these important and special qualities at risk. Prior to coming under the control of Redland Shire Council, the Islands were allowed to be subdivided in a manner that largely ignored their natural attributes and unique setting. The existing subdivision pattern has the potential to deliver a density of development higher than that of many of the suburbs of inner Brisbane, but clearly without the urban facilities to support such development. Furthermore, the 19,000 or so lots that were created have over time been marketed and sold at inflated prices, this process being aided by recurring speculation of a bridge link to Russell Island. Expectations for development of the Islands, particularly by non-residents were consequently raised to unrealistic and unsustainable levels, and rates and levies have been paid on the basis of these expectations.

The Southern Moreton Bay Islands Planning and Land Use Strategy has regard to all these issues, and aims to address the past lack of proper planning for the Islands. The Strategy provides a framework for the future development of the Islands to ensure those features that make the Islands special are retained for existing and future generations.

1. Introduction

General

The Southern Moreton Bay Islands Land Use and Planning Strategy has been prepared as a framework for the future development and conservation of Russell, Macleay (including Perulpa), Lamb and Karragarra Islands.

The strategy has been prepared following comprehensive technical investigations relating to the Islands' environmental cultural and community attributes, drainage issues and infrastructure requirements, together with an extensive community consultation process. The outcomes of these various investigations and the consultation process are detailed in the Southern Moreton Bay Islands Planning and Land Use Strategy Background Report.

Background

The Islands are situated in the southern end of the Moreton Bay Marine Park. They are rich in environmental and cultural resources and offer an idyllic quiet lifestyle on the doorstep of Australia's third largest and fastest growing metropolitan area. The location of the Islands is shown in Figure 1. However, prior to coming under the control of Redland Shire Council, the Islands were inappropriately subdivided and the lots sold.

The resultant pattern and intensity of subdivision on the Islands has led to the creation of a number of longstanding regional land use problems. These stem from the private ownership of approximately 20,000 largely unserviced lots, many of which have an area of less than 600m^2, located in the environmentally sensitive Moreton Bay Marine Park.

These lots were created with little regard to natural drainage systems and environmental values. Over 5,600 of the lots are affected by overland stormwater flows, are subject to tidal inundation or comprise environmentally sensitive wetland communities.

Furthermore, whilst the subdivision resulted in urban sized lots, no urban infrastructure was provided at the time of subdivision. There was no infrastructure based rationale for the staging of development, and as a result dwellings are scattered across the four Islands. The retrospective provision of services including all-weather roads and reticulated water and sewerage is made more difficult and expensive as a result of this scattered settlement pattern.

The land values in general are very low on the Islands, except for foreshore lots and others offering views to the Bay. As a result, a wide range of people have invested there, some seeking a low cost quiet lifestyle, some seeking holiday or weekend retreats and others investing for future retirement or long term capital gain. At various times expectations of a bridge to Russell Island have led to surges in property transactions and market prices.

There is seemingly a steady turnover of land at most times, apparently fuelled by uncertainty over development potential or a desire for more convenient access to mainland services. Uncertainty over what is going to happen on the Islands appears to be a major concern particularly to the residents and landowners of Russell, Macleay and Lamb Islands.Without modification, the existing subdivision pattern on the Islands could potentially accommodate a population of 30,000 to 40,000 residents.

It is conceivable that without intervention, the potential level of development on the Islands could exceed the capacity of the environment to assimilate impacts, as well as exceed the capacity of government agencies to provide the basic range of community facilities and services needed for such a sizeable population.

This land use and development strategy is intended to establish ultimate levels of development that can be sustained on the Islands, and to provide residents and landowners with a clear understanding of the type and extent of development, services and infrastructure that can ultimately be expected.

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 provisions 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 the Islands' unique environmental characteristics, achieving a balance between environment, infrastructure and service needs.

The Land Use policy changes arising from this strategy will principally be implemented through amendments to Redland Shire's Strategic Plan and other necessary statutory land use instruments.

2. Guiding Strategic Principles

2.1 Guiding Principles

There are two strategic principles which guide the formulation of the land use and development strategy for the Islands. These are as follow:

- ecological sustainability; and
- the Island vision

Both these principles, detailed below, provide the context within which the various strategies have been formulated.

2.1.1 Ecological Sustainability

Protection of the Shire's environmental attributes and the principle of ecological sustainability underpin all developments in Redland Shire. The Islands' unique attributes and setting within the Moreton Bay Marine Park lends further significance to this principle. The definition of ecological sustainability as provided by the *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.

Measures related to economic development and the maintenance of the physical and social wellbeing of communities are also important to overall ecological sustainability.

2.1.2 Island Vision

The second guiding principle is the image or vision for how life on the Island should be at some time in the future. This vision of sustainable life on the Islands was formulated following assessment of the ecological, social and cultural attributes of the Islands, and importantly, having regard to community input received early in the study process.

This vision 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 most 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".

This vision received strong endorsement through subsequent consultation with the community - with over 70% of written newsletter responses indicating agreement.

2.2 Secondary Principles

Flowing from the overarching principles related to ecological sustainability and the Island vision are several secondary principles which have also been incorporated into the land use and development strategy. These are detailed below.

2.2.1 Achievement of More Appropriate Levels of Development

The existing subdivision pattern and resultant potential population level is inappropriate for the Islands' unique setting and environmental significance. There is an overall need to reduce the number of developable lots on the Islands through measures such as lot amalgamations, precluding development from environmentally sensitive or constrained areas (discussed further below) and precluding or limiting development from areas the protection of which would help achieve long term ecologically sustainable development.

2.2.2 Protection of High Conservation Areas

Areas that were identified as having significant conservation value should be protected. These include areas that have significance in terms of:

- terrestrial flora and fauna;
- management of natural waterways;
- landscape; and

- cultural heritage.

Protection of these areas will contribute to the retention of both a biological and visual buffer against the impacts of development in this part of the Moreton Bay Marine Park.

2.2.3 Protection of Aquatic Ecosystems

Protection of the marine/intertidal and freshwater wetland ecosystems is also important to the achievement of ecological sustainability. The wetlands provide unique habitats for a variety of plant and animal species, and act as natural buffers for stormwater discharges to Moreton Bay.

The marine and intertidal areas fall within the Moreton Bay Marine Park and are vital to the viability of marine life in the Bay.

2.2.4 Land Subject to Flooding or Tidal Inundation

Areas subject to flooding from overland stormwater flows should be precluded from development due to risks associated with potential property damage. Retention of natural overland flow paths provides opportunities for the natural filtering of stormwater runoff and can reduce potential for erosion and sedimentation and the need for expensive stormwater infrastructure.

Development should be precluded from such drainage paths where there is risk to property or where development has the potential to exacerbate upstream flooding.

Areas subject to tidal inundation generally correspond to areas of high conservation value and warrant protection. Apart from risk of inundation during times of cyclonic weather or exceptional tides, development in such areas poses the risk of exposing acid sulphate soils and damaging sensitive intertidal ecosystems.

2.2.5 Water-Based Transport

The draft strategy has been predicated on the basis that water-based transport will continue to service the Islands. The environmental impacts associated with future increases in ferry and barge services will need to be managed along with those associated with recreational boating. No provision is made for a bridge between Russell Island and the mainland.

A bridge to Russell Island is in conflict with the strategic planning directions outlined in the State Government's Moreton Bay Strategic Plan and the recent initiatives designed to reduce dependence on private vehicles outlined in the Integrated Regional Transport Plan. Furthermore it would be inconsistent with the underlying principles of ecological sustainability and the Island vision since:

- there remain many uncertainties and concerns in relation to the environmental and social implications of a bridge to Russell Island;
- a bridge is likely to significantly alter the complexion of development on the Island (for example by leading to pressure for higher density housing and a

range of non-residential uses) to the extent that it would become a metropolitan suburb. Such an outcome would be inconsistent with the lifestyle values highlighted throughout most of the community consultation process and with the Island vision;

- a bridge is likely to result in a demographic profile on Russell Island akin to that of the rest of the Shire, with its attendant higher occupancy rates and overall population density (up to 30% more people); and
- a bridge is likely to lead to more vehicles on the Island (both from residents and visitors), necessitating wider roads and exacerbating stormwater management and pollution control concerns.

In short, whilst a bridge is recognised by some people as the initiative which may bolster the Russell Island property market to make the provision of urban infrastructure services viable and to address access concerns, it would lead to development and population pressures of a magnitude difficult to manage in such an ecologically sensitive environment. The marine environment in the southern part of Moreton Bay is already showing signs of stress from the impacts of urban development and other land uses in the Logan River catchment.

2.2.6 Appropriate Levels of Infrastructure

Provision of appropriate infrastructure is crucial to the ongoing sustainability of development. The infrastructure should however be tailored to the specific needs of each Island and not detract from the Island landscape. Natural drainage systems, a low impact road network, and eventually, reticulated sewerage, are envisaged in the strategy.

Provision of social infrastructure (community services, health welfare facilities etc.) similarly will not be provided to the same level as available on the mainland. Whilst a basic level of services will be required and planned for, potential future residents will need to choose between access to the full range of services available on the mainland and enjoyment of an Island lifestyle.

2.2.7 Island Specific Solutions

All Islands have differing environmental and locational attributes together with differing population characteristics. It is clear the residents wish to retain their separate Island identities and interests. This needs to be reflected in land use opportunities, community development and environmental management initiatives provided in the strategy.

However, having stated this it will also be necessary to view the Island group as a whole when it comes to considering threshold populations for the longer term provision of community services and facilities.

2.2.8 Implementation Costs

Implementation of the strategy will have significant cost implications for the broad community, and economic considerations need to be considered as a component of ecological sustainability.

Minimal development scenarios result in lower engineering infrastructure costs, together with lower costs associated with the provision of community services and facilities and with environmental management. However, these cost savings may be largely negated by higher costs associated with the acquisition of land and, in some cases, through compensating property owners for lost development rights.

Full development scenarios imply more costly standards of both engineering and community infrastructure and more expensive measures in order to reduce environmental impact. On the other hand, the resultant higher population means lower per capita costs of infrastructure, and provides one potential source of future income for its provision, operation and maintenance.

Sources of revenue for land acquisitions are limited. Council's general rate revenue or revenue raised through special levies (such as the Shire's Environmental Levy) are potential sources. However, there is already a heavy demand on both of these sources of revenue.

State or Commonwealth Government funding is an alternative source with these spheres of Government having a larger revenue base than Local Government. In times of increasing demands on State and Commonwealth funding, there are likely to be financial constraints to the implementation of strategies which rely on extensive resumption or acquisition of properties.

These cost implications must be considered as part of the overall land use and development strategy for the Islands.

3. The Strategy in Brief

3.1 Strategic Direction

3.1.1 General

Formulation of a land use and planning strategy for the Southern Moreton Bay Islands based on the above strategic principles is complicated by the Islands' existing subdivision pattern, together with the setting within the Moreton Bay Marine Park.

Full development to the capacity of the existing subdivision pattern would represent one end of the development spectrum for the Southern Moreton Bay Islands. As noted previously, this would potentially deliver an overall population of between 30,000-40,000 residents. On the larger Islands, Russell and Macleay, this would mean suburban-like development, with housing densities higher than most of the suburbs of metropolitan Brisbane.

Such an outcome would raise serious concerns in relation to the ability to provide adequate services for the population as well as the likely environmental impacts on the ecology of Moreton Bay. It is unlikely to deliver an acceptable balance between the three components of sustainability with economic development overshadowing environmental, social and cultural protection imperatives. It would also have implications for Redland Shire's overall land use strategy and infrastructure network.

Wholesale property resumptions (with or without subdivision restructuring) to drastically reduce lot and population yields represents the other end of the development spectrum. If the existing undeveloped lots were acquired (at a cost of around $60-$70M) and precluded from development, the population would remain at around the current level of around 2500 residents. Alternatively, if the average lot size was increased from the current 500-600 m^2 to 6,000 m^2 (the minimum size at which on-site effluent disposal is considered sustainable), the ultimate population from the Island group would be closer to 4,000 residents and minimal infrastructure would be required. Both these latter approaches tend to disregard the investment made by, and expectations of, many existing landowners.

3.1.2 Achieving the Strategic Principles

The Moreton Bay Strategic Plan introduces the concept of sustainable population levels for the Islands, that is, the number of people which can live and work on the Islands before irreversible impacts to the natural (and cultural) environment occurs.

Defining a theoretical sustainable population level based on indicators of environmental capacity (such as terrestrial flora retention, water quality or 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 measures to be put in place. This has been the approach adopted to ensure that the land use and development strategy achieved the guiding strategic principles discussed above.

The land use and development strategy presented recognises that appropriate levels of development can occur *providing* development is carried out within an overall context of effective environmental and landscape management. In addition to adopting best practice solutions to infrastructure provision, waste management and stormwater management, specific measures will need to be incorporated to ensure adequate protection is provided for those attributes of environmental, landscape and cultural significance. More specifically, providing environmentally sensitive areas can be protected and appropriate measures put in place to manage stormwater runoff and domestic effluent, *moderate* levels of development on the Islands has been assessed us being environmentally sustainable.

Economically, the Island group is likely to remain reliant on the mainland for higher order facilities and services, as well as employment. Arguably, it is the absence of these higher order economic activities (industry, major tourism entertainment centres etc.) which contributes to the Islands' character and which attracts residents seeking alternative lifestyles. This is the trade-off made with the convenience offered by a suburban lifestyle, and a theme which features strongly in the overall vision for the Islands.

3.2 Key Features of the Strategy

The key features of the strategy are as follows:

- Development has been precluded from, or limited in, areas of greatest environmental value, areas which would also enable significant savings in infrastructure provision to be achieved, and in areas likely to be significantly affected by overland stormwater flows or tidal inundation. Elsewhere, it is generally proposed to retain the existing subdivision pattern with an ongoing reduction in the number of developable lots encouraged through a limited range of amalgamation incentives.

- Ultimately the lots will be serviced with reticulated sewerage. Roads will be upgraded to provide all weather access, and reduce ongoing maintenance costs.

- Best practice stormwater measures (such as retaining basins, overland drainage systems and erosion and sediment controls) are crucial to the sustainability of development and will be used to manage both the quantity and quality of runoff into the marine environment.

- Controls are also proposed to reduce tree clearing on lots in order to reduce impacts of development on the landscape.
- Open space corridors are proposed along the major drainage corridors, appropriate sections through which a network of pedestrian and bicycle trails is ultimately envisaged.
- These open space corridors would also serve to break up the subdivision pattern and contribute to the establishment of precincts. In turn, these precincts will help define housing areas (particularly when nearing full development) and reinforce "sense of community".
- Strategies for the long term provision of a basic range of community facilities and services appropriate to both the needs of each Island and to the needs of the Island group, as a whole, are proposed. These strategies will reflect the fact that the Islands will always be reliant on the mainland for highest order facilities and services, and residents will have made the conscious decision to trade-off immediate access to such facilities and services for an Island lifestyle.
- Locations for the clustering of shops, community facilities, services and other suitable local economic activities have been identified. Opportunities will also be provided for appropriate low key tourism and education/ research activities.
- Access to the Islands will be by water-based transport (ferries and barges). Use of public transport both on the Islands and on the mainland will be encouraged to reduce the need for private vehicles. The strategy will include ongoing liaison with the Department of Transport and other service providers in relation to the need for progressive upgrading of public transport services.
- The ultimate number of lots available for development on the Islands delivered through the strategy is around 11,348. This would translate to an ultimate population of around 22,696 distributed across the Islands as follows:
  - Russell Island 13,054
  - Macleay Island 7,512
  - Lamb Island 1,550
  - Karragarra Island 580

The policies and measures that will be put in place to achieve this strategy are presented in Section 4.

4. Planning Policies and Achievement Measures

In order to achieve the preferred strategy and provide a planning and environmental management framework that accommodates the identified Island lifestyle, a number of planning principles and policies have been determined. They were developed in conjunction with the community and address issues of:

- lifestyle;
- land use and development;
- access and transport;
- environment and landscape conservation;
- utility services;
- open space and recreation, and
- economic development and tourism.

The principles and policies received overall strong community support (refer to Section 6 of the Planning Report). Measures through which they could be achieved were subsequently formulated, and are listed along with the policies below in Table 4.1. It is the implementation of these achievement measures to suit the specific needs of each Island which will form the basis of the land use and planning strategy for each Island.

The right hand column in Table 4.1 provides a reference to the specific strategy through which each of the achievement measures will be implemented. These strategies, and their location in this document, are as follows:

1. Conservation and Landscape Strategy (Section 5)
2. Water Management Strategy (Section 6)
3. Strategy for Land Subject to Flooding or Tidal Inundation (Section 7)
4. Economic Development Strategy (Section 8)
5. Access and Transport Strategy (Section 9)
6. Infrastructure Strategy (Section 10)
7. Human Services Strategy (Section 11)
8. Cultural Heritage Strategy (Section 12)
9. Preferred Land Uses (Section 13).

Table 4.1
Planning Policies and Achievement Measures

Policy	Achievement Measures	Strategy Reference Number
LIFESTYLE		
Encourage use of community based transport.	• Provide alternative passenger jetty locations and create pedestrian and cycle links. • Encourage development of a community transport service.	5 5
Reduce the potential for development to impact on foreshore areas and other areas of high visual sensitivity.	• Limit development below RL 2.4 to accommodate the maintenance of physical and biological processes, storm surge, visual amenity and in some instances, public use and access. Consideration of development below RL 2.4 m on an individual performance basis subject to demonstration of no adverse impact on the terrestrial and marine environment and visual amenity. • Require building siting controls and retention/ reinstatement of natural vegetation where lot size permits. • Adopt design and siting controls or guidelines for development which promote a building character unique to and appropriate for the Islands.	3 1 1
Adopt measures to improve public access to appropriate foreshore areas.	• Identify locations for the establishment of jetties, boat ramps and recreation areas and prepare development and management strategies.	5
Encourage a wider range of commercial and community facilities.	• Provide locations for the establishment of a hierarchy of commercial and community facilities.	4
Retain Islands' unique lifestyle as an alternative to that on the mainland.	• Adopt levels of service for infrastructure which reflect Island character, eg. lanes not streets, use of natural waterways for drainage. • Encourage lot amalgamations through rate and fee relief and other financial incentives. • Introduce vegetation management measures (see Environment and Conservation).	6 1 1
LAND USE AND DEVELOPMENT		
Amend the existing subdivision pattern to provide more space between dwellings and cater for non-residential uses.	• Identify and preclude development on lots required to promote open space linkages and opportunities. • Identify and protect sites required for service industrial, commercial and community uses. • Provide financial incentives for lot amalgamations. • Prohibit further residential subdivision, except where it leads to a reduction of lot numbers.	9 4 1 1
Protect the Islands landscape character.	• Require retention of vegetation particularly in sensitive areas. Through design and siting measures, promote building character that reflects Island landscape character.	1

Policy	Achievement Measures	Strategy Reference Number
Reduce the potential for development in areas that are visually sensitivity, drainage lines and foreshores.	• Establish open space corridors along drainage lines. • Require building envelopes or vegetation retention in visually sensitive areas. (Also see Environment and Conservation)	9 1
Preclude poorly drained land and land affected by tidal surge from residential development.	• Preclude development from those lots with identified drainage problems. • Require siting controls on those lots identified as being partially constrained by flooding or drainage. • Limit development below RL 2.4 m.	3 3 3
Promote suitably located community facilities and shops as the focus for communities.	• Identify suitable locations and designate sites for the establishment of local centres within residential areas of Macleay, Russell and Lamb Islands. • Limit the development of shops, community facilities and other employment generating uses outside these centres. • Locate major shops and community facilities to serve the entire Island group population in "Island themed" village centres, walkable from the jetties on Macleay and Russell Islands. • Provide opportunities for the establishment of centres which relate to the foreshore and Moreton Bay on Macleay and Russell Islands.	7 4 4 4
Adopt development strategies that reflect the character of, and community aspirations for, each Island.	• Introduce appropriate development controls within each conservation area for each Island (also see Environment and Conservation). • Because of their high landscape value, upgrade the status of medium and low conservation areas on Macleay and Lamb Islands and introduce appropriate development controls. • Provide sites for the location of a range of non-residential uses appropriate for the envisaged population of each Island.	1 1 8
Promote opportunities for population - supporting uses which can generate local employment compatible with the Islands lifestyle.	• Identify precincts which provide opportunities for tourism, recreational boating and educational uses on all Islands except Karragarra. • Provide for the establishment of service uses (eg. mower repairs) at centres.	4 4
ACCESS &TRANSPORT		
Promote the development and upgrading of the water-based transport system and related infrastructure.	• Identify and assess alternative sites for the establishment of secondary passenger jetties on Macleay and Russell Islands. • Continue to promote the introduction of service contracts for water transport operators. • Ensure all Island and mainland transport facilities are designed to encourage and accommodate increased water based transport. • Ensure water-based transport facilities are designed to provide equity of access to all users.	5 5 5 5

Policy	Achievement Measures	Strategy Reference Number
Promote the upgrading of the on-Island and mainland public transport system and greater co-ordination between services.	• Continue to liaise with Department of Transport and the public for improved transport provision. • Limit the provision of future carparking facilities to encourage car pooling or greater use of public transport (although current parking facilities at Macleay and Russell Islands should be upgraded to accommodate needs until transport is available). • Examine subsidy/incentive schemes for transport service providers.	5 5 5
Promote a water based transport system that caters to extended hours of demand and a range of community needs.	• Continue to promote the introduction of service contracts which include community service obligations.	5
ENVIRONMENT AND CONSERVATION		
Promote the protection and establishment of locally native flora and fauna and encourage the re-establishment of such flora. Control development which could be detrimental to vegetation in areas of conservation priority, on foreshores and in visually prominent locations	• Preclude development from high and very high conservation areas. • Preclude development from medium conservation priority areas on Macleay, Lamb and Russell Islands. • Require retention or reinstatement of on-site vegetation in areas of higher visual sensitivity.	1 1 1
Control development which could be detrimental to significant heritage places	• Identify Aboriginal and European heritage items or places and determine appropriate conservation action.	8
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 runoff and remove contaminants from stormwater.	• Maximise use of natural drainage lines. • Utilise techniques to retard and pretreat stormwater runoff, and to increase stormwater infiltration. • Retain or reinstate vegetation along 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. • Adopt special measures for development in catchments draining to freshwater wetlands. • Adopt special measures for development in catchments draining to estuarine areas, tidal creeks and tidal wetlands.	2 2 2 2 2 2 2

Policy	Achievement Measures	Strategy Reference Number
Re-establish riparian vegetation in degraded drainage corridors.	• Encourage rehabilitation of degraded areas and areas which could provide strategic linkages between conservation areas.	2
UTILITY SERVICES		
Provide reticulated sewerage to all lots under 6000m^2 to reduce public health risks and environmental impact from on-site effluent disposal, as catchments become increasingly developed.	• Identify servicing priorities, staging and likely timing for the introduction of sewerage. • Investigate future effluent disposal options.	2 & 6 2 & 6
Consider alternative forms of on-site effluent disposal for non-urban lots.	• Other forms of on-site waste disposal for lots over 6000m^2 in area (and for smaller lots as an interim measure prior to the introduction of sewerage) to be assessed on their merits.	2 & 6
Adopt roads standards appropriate to each Island.	• Upgrade roads to a standard which provides safer all weather use, is in keeping with the landscape character and is low maintenance.	6
Adopt measures which minimise the environmental and visual impact of services provision.	• Ensure services are provided in a manner which reduces vegetation removal, earthworks and erosion potential.	6
OPEN SPACE AND RECREATION		
Provide connected open space/pathway systems.	• Identify likely active open space requirements and suitable areas for such use. • Identify opportunities and acquire land to link open spaces along drainage corridors and foreshore areas.	9 9
Provide strategic opportunities for open space along foreshores.	• Identify and protect suitable sites for recreation and water access and prepare site development and management plans.	3 & 9
TOURISM/ECONOMIC DEVELOPMENT		
Provide for increased day visitors, number, recreational boating and other activities which contribute to the economic base of the Islands.	• Identify sites on Russell, Macleay and Lamb Islands for possible development of facilities for tourism or recreational boating and related uses.	4
Encourage forms of tourism that both promote and ensure the protection of the Islands' natural and cultural attributes.	• Support community groups wishing to document and protect items of cultural heritage significance. • Develop cultural heritage/historic trails. • Develop nature trails along foreshore and in conservation areas. • Seek State and/or Commonwealth funding for the protection and management of natural areas.	4 4 4 4
Provide for public	• Identify and protect suitable sites for water access	4 & 5

Policy	Achievement Measures	Strategy Reference Number
boat ramps and moorings in suitable locations.	and moorings as part of the overall water based transport strategy. .	
Provide for educational/research activities.	• Encourage and support initiatives for the establishment of educational and research activities which complement each Islands' image and lifestyle.	4

5. Conservation and Landscape Strategy

5.1 Purpose

The purpose of the conservation and landscape strategy is to protect those elements of the natural environment that contribute to the Islands' unique landscape and ecological functions.

5.2 Discussion

Vegetation

Vegetation on the Islands was categorised into four conservation priority designations, low, medium, high and very high. The conservation priority categories were principally based on the floristic significance of the sampled vegetation in each area. The major exceptions were areas of mixed eucalypt forest. Whilst assessed as being of low floristic significance, these areas were upgraded to the moderate (medium) conservation priority category on the basis of their significant habitat potential. These areas, particularly at the southern end of Russell Island, represent relatively large (although not undisturbed) tracts of vegetation, together with areas which could be rehabilitated to enhance habitat value.

The strategy for vegetation protection essentially involves the retention of all areas assessed as having medium, high and very high conservation priority on all the Islands. These areas are shown on Figures 2(a) and 2(b). The high and very high conservation areas are generally associated with the freshwater wetlands and fringing intertidal ecology.

The medium conservation areas cover a wider range of landscapes. A number of factors has led to the inclusion of these as protected areas. On Russell Island, the medium conservation priority areas cover an extensive part of the southern end of the Island. These areas were identified for protection on the following grounds:

- because of their overall conservation significance and potential for regeneration;
- due to the contribution these areas could make to the protection of important freshwater wetlands and intertidal ecosystems at the southern end of Russell Island;
- the acquisition of these areas provides the only real opportunity to significantly alter the future development pattern on the Island and achieve more sustainable population levels;

- these areas have the lowest overall development density on all the Islands and represent the only areas where significant savings in infrastructure could be made; and
- these areas also have high cultural heritage significance which could be protected by precluding further development.

At the northern end of Russell Island, the medium conservation priority areas have been protected as they will make a significant contribution to the future residential amenity of what will be the most intensively developed area on the Island. They also provide additional buffering between residential development and the natural drainage corridors.

The medium conservation areas of Macleay and Lamb Island were upgraded in status for protection following community input from the Island summit. Protection of the medium conservation areas took on greater significance on these Islands due to the relative lack of higher conservation vegetation and the significance placed in protecting the Islands' landscape values.

The medium conservation priority areas on Karragarra Island generally comprise a narrow band of vegetation along the southern foreshore, often in areas below the RL 2.4 m development line. Development on blocks with this designation is considered appropriate on land above RL 2.4 m provided the integrity of the vegetation corridor behind the foreshore is retained.

Even with the above measures, the preferred land use and development strategy, whilst achieving a reasonable balance between the three components of ecological sustainability (environment, social/cultural and economic development) will nonetheless involve substantial increases in population and construction activity over current levels. However, it does achieve a significant reduction in the level of development which could occur without intervention given the existing subdivision pattern.

Under the existing subdivision pattern, 77% of the total area of the Islands would be subject to development which could substantially clear the existing terrestrial vegetation. The small lot sizes and the current requirement for vegetation clearance zones around dwellings (which have been significantly reduced by a recent Council resolution) currently does not encourage retention of vegetation on lots. Under the preferred strategy, the percentage of substantially cleared area would be 60%. The main areas retained occur in conservation priority locations, waterways, buffer areas and open space corridors.

Table 5.1 shows the proportion by Island of vegetation retention for the current, ultimate (ie. no intervention) scenario and the preferred strategy.

Table 5.1
Retention of Vegetation Under the Preferred Strategy

Island	Proportion of conservation priority terrestrial vegetation retained[1].							
	Ultimate				Preferred			
	VH	H	M	L	VH	H	M	L
Russell	82%	12%	11%	7%	100%	99%	100%	7%
Macleay	29%	-	18%	7%	100%	-	100%	7%
Lamb	54%	32%	15%	11%	100%	100%	100%	11%
Karragarra	20%	90%	13%	25%	100%	90%	50%	25%
Total	**64%**	**12%**	**10%**	**7%**	**100%**	**98%**	**98%**	**7%**

Notes: 1. Present level assumed to be 100%, Proportions generally on allotment numbers.

The table indicates that the preferred strategy allows for the retention of most of the vegetation with conservation significance. However, this type of vegetation forms only 46% of the total area of the Islands, of which about 80% is on Russell Island. Unless appropriate measures are adopted to ensure retention of vegetation on lots subject to development, the general mosaic of vegetation through the remaining (ie. majority) of the Islands is likely to be substantially cleared. Only the southern areas of Russell Island and some of the eastern part of Macleay Island would retain substantial terrestrial vegetation - and most of that retained on Russell is wetland, rather than eucalypt forest or woodland.

Fauna

Protection of fauna is linked to retention of habitats. These will generally be achieved through protection of those areas of medium, high and very high conservation value as discussed above.

Development is likely to impact on fauna through loss of habitat in unprotected areas, particularly for birds and arboreal mammals.

In relation to the ten species listed under the Nature Conservation Act as rare or vulnerable fauna, two are reliant on terrestrial habitats (burrowing skink and glossy black cockatoo). Another two significant species - the short beaked echidna (Nature Conservation (Wildlife) Regulation 1994) and the rainbow bee eater (CAMBA) are also essentially terrestrial in habitat. Development has the potential to reduce the habitat of the burrowing skink, which potentially encompasses all of the eucalypt forests on Macleay and Russell Islands. It is also likely to reduce the available habitat for glossy black cockatoos, but the known nesting locations will be protected. Similarly, the habitats for the echidna and rainbow bee eater will be reduced.

The extent of habitat reduction in each case cannot be estimated from the available data. However, there are mitigating opportunities which could provide support for the species with more specific preferences - notably the glossy black cockatoo. Furthermore, the introduction of fire management

practices to reduce clearing of understorey vegetation and encouragement and education of landowners to use native species in landscaping and other planting (such as *Allocasuarina littoralis*, which is an important food source for the glossy black cockatoo and has the added advantage of being fire resistant) will reduce development impacts.

The conservation strategy provides for habitat protection for the remaining rare and vulnerable fauna which are associated with wetter environments (five wetland/intertidal and three marine species). This includes a further fifteen shorebird species listed under international migratory bird agreements (JAMBA or CAMBA).

A key factor in the survival of wetland and marine species will be water quality, which is discussed in Section 6. Other impacts may come with population growth - largely from increased recreational boating, bait collection, fish harvesting and general disturbance of intertidal areas. The effects cannot be predicted with any accuracy, but they could result in significant increases in local mortality of listed species as well as potential long term decline in bird populations at sites prone to disturbance.

Landscape

Maintenance of the Islands' landscape character is critical to the achievement of the Island vision. In recognition of this, an assessment was carried out to identify those features which contribute most to the landscape character and which are regarded as visually sensitive.

Figures 3(a) and 3(b) indicate those features assessed with high and very high visual sensitivity on the Islands. They generally include the vegetated tidal wetland areas, the vegetated drainage lines and associated wetlands and the significant hills and promontories. Retention of the vegetation in these areas will tend to buffer the visual impacts of development elsewhere on the Islands.

Other features or areas identified as requiring specific landscape management measures are as follows:

- lands adjacent to the foreshores particularly where saltmarsh and mangroves are absent or have been disturbed;
- undulating partially developed and undeveloped areas internal to the Islands;
- escarpment edges, particularly greater than 5 metres in height; and
- along existing roads and streets.

All these areas are dominated by extensive, but clearly thinned, tree cover.

Measures which reduce the removal of further vegetation in these areas and minimise the visual impact of development are included in the conservation and landscape strategy.

Mosquitos and biting midges

Chemical methods of mosquito control are a potential threat to intertidal and marine ecology. Any increase in population is likely to result in additional

pressures on Council to undertake more control measures. However, the current control program is already moving to reduce chemical usage and maximise physical forms of control.

Education of existing and future Island residents is seen as an integral element of any strategy in relation to mosquitos and midges.

5.3 Environmental Management

Rare and threatened flora and fauna sites occur within the areas from which development is to be precluded. The main risks to these areas would be indiscriminate fire management, deliberate interference or (in the case of fauna) feral predators.

General vegetation loss from development will be modified in some areas by the retention of tracts of land for conservation and the introduction of controls to limit clearing on residential blocks. Vegetation protection orders applied in all conservation priority areas will have some value by:

- restricting unnecessary clearing from larger allotments; and
- restricting unnecessary clearance for fire management.

Council has recently reduced the prescribed clearing distance around dwellings from 30 to 6 metres. This is seen as a major initiative in the protection of vegetation on developable lots. Others could include a requirement that a minimum proportion of a lot or a corridor along the common boundary at the rear of lots be retained in, or reinstated to, a vegetated state.

5.4 Management Strategy

The conservation and landscape strategy recognises that change will take place and proposes a range of measures to mitigate the effects of change and to protect the Islands natural environment and landscape values.

Table 5.2 provides an overview of the actions recommended to implement the conservation and landscape strategy. For each conservation aspect, the achievement measures and actions are described. Each action is accompanied by a recommended priority.

Table 5.2
Conservation Management Strategy

Achievement Measure	Actions	Priority
Protection of Rare and Endangered Flora		
Adopt measures that minimise vegetation loss.	• Rezone to preclude development from areas of high and very high conservation priority and also areas of medium conservation priority primarily on Russell, Macleay and Lamb Islands.	H
Promote the protection and establishment of indigenous flora.	• Prepare and implement management plans for the flora species of particular conservation significance.	H
	• Temporarily ban control burning from protected areas until conservation plans are finalised.	H
Protection of Rare and Threatened Fauna		
Adopt measures that minimise vegetation loss.	• Declare protected areas under the *Nature Conservation Act* for potential false water rat habitat.	H
Promote the protection and establishment of indigenous flora and fauna and encourage the re-establishment of indigenous flora.	• Declare protected areas under the Nature Conservation Act for any known habitat of a rare or threatened species.	H
	• Protect and enhance feed tree (casuarina) areas for glossy black cockatoos - particularly on Macleay and Karragarra Islands.	H
	• Encourage the planting of feed tree species by residents.	H
	• Consider use of casuarina species in rehabilitation programs, particularly in fire prone areas.	H
	• Prepare and implement management plans for fauna species of conservation significance.	H
	• Temporarily ban control burning from protected areas until conservation plans are finalised.	H
	• Provide householder education regarding dog and cat control.	M
	• Consider for purchase for conservation purposes undeveloped blocks which have old trees with hollows known to the nesting sites.	M
Marine Flora (mangroves, saltmarsh, seagrass and macro-algae)		
Adopt measures that minimise vegetation loss.	• Enforce existing controls related to development below RL2.4 m.	H
Promote the protection and establishment of indigenous flora and fauna and encourage the re-establishment of indigenous flora.	• Increase inspections of marine vegetation to monitor illegal clearing.	H
	• Implement householder education for landowners with foreshore allotments.	H
	• Remove any structures and revegetate any areas modified without permission.	M

Achievement Measure	Actions	Priority
	• Enact a policy to require replanting of any areas cleared without permit.	M
Terrestrial and Freshwater Wetland Flora with Designated Conservation Priority		
Preclude development in areas of very high conservation priority, and areas of medium conservation priority on Russell, Macleay and Lamb Islands.	• Rezone subject areas to either Open Space or Conservation. • Prepare householder and building education material on retention and planting of vegetation.	H M
Promote the protection and establishment of indigenous flora and fauna and encourage the re-establishment of indigenous flora.	• Provide householder education about invasive weed species.	M
Control development which could be detrimental to vegetation in areas of conservation priority, on foreshores and in visually prominent locations.	• Instigate a program of invasive weed eradication. • Revegetate degraded areas precluded from development.	M M
Fauna Habitat and General Vegetation Protection		
Adopt measures that minimise vegetation loss. Control clearing of vegetation in areas of high visual sensitivity.	• Adopt controls to limit the extent of clearing on lots and/or that require reinstatement of vegetation over a portion of the allotment in areas of high visual sensitivity or landscape value. The proportion should be 20% for lots under 600 m^2 and 30% for larger lots. • Control clearing of vegetation along drainage lines and adjacent wetlands.	H H
Promote the protection and establishment of indigenous flora and fauna and encourage the re-establishment of indigenous flora.	• Institute a program of householder and builder education - particularly in relation to retaining old trees with hollows.	M
Landscape Protection		
Adopt measures that minimise vegetation loss.	• Adopt clearing controls as described above.	H
Adopt design and siting controls or guidelines to promote a building character compatible with the Island landscape.	• Develop design controls or guidelines and incorporate in Town Plan to address building bulk and mass, to encourage the use of timber as alternative suitable light cladding materials, and to reduce cut and fill.	M
Encourage lot amalgamations through rate and fee reductions or other financial incentives.	• Review existing charges and procedures. Review subdivision requirements to ensure lot amalgamations are irreversible.	H
Prohibit further subdivision except where it leads to an overall reduction in lot numbers.	• Amend planning controls to increase minimum parcel size required for subdivision and amend land use zoning on large parcels.	H

Notes: H = High Priority

M = Medium Priority

6. Water Management Strategy

6.1 Purpose

The purpose of the water management strategy is to identify the range of measures that will be required to manage the quality and quantity of stormwater discharging to the freshwater wetlands and marine environment once the Islands are developed. This strategy is seen as critical to the ongoing sustainability of both the freshwater wetlands and intertidal areas which are among the Islands' most valued environmental assets.

6.2 Existing Water Quality

The location of the Islands in Southern Moreton Bay is an important consideration in water quality management. The surrounding areas host several rare or vulnerable marine animals, as well as a variety of habitats - mangrove, saltmarsh, seagrass, macroalgae, coral, rock, sand and intertidal sediment.

Some of the marine vegetation ecosystems have contracted in the area as a result of deterioration in water quality - most notably the seagrass areas south of Karragarra Island. Although there is some evidence that this is mainly a result of development in the Logan and Albert River catchments, there is a large number of other minor influences - including activities on the Islands.

Water quality around the northern islands is generally better than that around Russell Island, because the waters are constantly flushed by the tidal systems of the northern Bay. The limited data available show that water quality is well within national water quality guidelines, but has shown general deterioration as a result of the development of the Brisbane River catchment since European settlement.

The southern bay waters are subject to poorer tidal circulation due to the shallow and contorted channels in the area. The consequence is that pollutants have longer residence times and turbidity levels are usually higher. Floods, such as the May 1996 event, tend to result in extended periods of elevated nutrient, algae and suspended solid concentrations.

Several large freshwater wetlands are present on Russell and Macleay Islands, which have varying degrees of catchment development. All of them show some signs of water quality deterioration and vegetation changes resulting from nutrient enrichment.

6.2.1 Threats to Water Quality

The technical assessments suggested that the major potential environmental impacts of future development of the Islands are likely to result from:

- stormwater runoff - resulting from urban development;
- septic effluent - draining to groundwater from absorption trenches or surfacing due to hydraulic overload; and
- increased use of the waterways for recreational and commuting purposes (eg. boat strike, habitat damage, chemical and wastewater contamination)

From a land use management viewpoint, the first two categories are the most critical. Previous modelling (John Wilson & Partners, 1996) indicated that the major source of pollutants in the surface water would come from stormwater, with a minor component coming from septic effluent surfacing. The quantity and fate of septic effluents which enter the groundwater system were not modelled, but the existing lot sizes and types of treatment systems commonly used on the Islands are not considered sustainable.

The conclusions drawn from the analysis were that surface water pollution is a major issue to be further analysed and that groundwater pollution should be addressed through either a major upgrade of sewage treatment systems or a significant reduction in lot densities.

A surface water modelling analysis was undertaken based on the ultimate lot densities for the preferred strategy. Catchments which drain to sensitive receiving environments were identified on the basis of:

- poor tidal circulation (which reduces the effectiveness of dilution in the marine environment);
- direct connection to inshore seagrass areas (ie. the seagrass virtually abuts the coast and is not buffered by mangroves or mudflats); and
- containing a freshwater wetland within the catchment.

In addition to the sensitivity criterion, two other benchmarks were used - 'best practice' nutrient loads and ANZECC nutrient concentrations. These benchmarks are reasonably stringent and would result in a quality of stormwater practice comparable with the best in Australia. In other words, practices would be of significantly higher quality than the prevalent standards within existing developments in Queensland.

The term 'acceptable levels' means the following concentrations and loads:

Freshwater and Estuarine

Total - N		***Total - P***	
Load kg/Ha/yr	Conc'n mg/L	Load kg/Ha/yr	Conc'n mg/L
6	**0.5**	**1.1**	**0.05**

It should be noted that there are no ANZECC guidelines for acceptable concentrations of Total-N and Total-P in estuarine or marine waters. The only guidelines relate to ammonia, nitrate and reactive phosphorus, all of which are difficult to predict in stormwater modelling analysis.

The benchmarks were chosen on the basis of restricting the level of increase in pollutant exports, so that natural processes (such as denitrification, sediment adsorption and dilution) may be capable of sustaining the increases. The use of stormwater controls in all catchments to ensure that benchmarks can be met will need to be matched with a receiving water monitoring program because the natural system responses are complex and cannot be precisely predicted.

The 'sensitive catchments' are shown in Figures 4(a) and 4(b). The results of the analysis are summarised in Table 6.1. The table indicates the total and percentage numbers of catchments which are predicted to exceed nutrient export benchmarks when development reaches planned levels. For comparison, totals of current and ultimate (ie. no intervention) are included.

Table 6.1
Number of Catchments Exceeding Nutrient Export Benchmarks

Catchments Exceeding Benchmarks								
Location	**Current**		**Preferred Strategy**				**Ultimate**	
			Overall		**Sensitive**			
	Total No.	**%**	**Total No.**	**%**	**Total No.**	**%**	**Total No.**	**%**
Karragarra	0	0	1	13	0	0	2	25
Russell	1	4	17	68	16	64	19	76
Lamb	1	13	7	88	4	50	7	88
Macleay	0	0	22	76	17	59	22	76
Total	**2**	**3**	**47**	**67**	**37**	**53**	**50**	**71**

Those catchments requiring additional stormwater management measures are shown in Figures 5(a) and 5(b).

Without special measures to manage stormwater, even the reduced levels of development proposed in the preferred land use and development strategy would have a high proportion (68-88%) of catchments on the three largest Islands likely to exceed acceptable nutrient export rates. Even when only sensitive catchments are considered the corresponding figures range from 50-64%.

Whilst general best practice stormwater management measures can be readily adopted to deal with the majority of these catchments, development is likely to give rise to several 'hot spot' catchments which would require attention to stormwater and wastewater management. The key areas are those draining to:

- Canaipa Passage on Russell Island (R1-R11) which is tidally restricted due to the north-south tidal split near Canaipa Point; only two of the catchments (R8 and R11) will not exceed these criteria.
- The freshwater wetlands on western Russell Island (R13, R16-R22), all of which are predicted to exceed phosphorus criteria.
- The seagrass and tidally restricted waters around Lamb Island. Four of the catchments drain to seagrass areas (L2, L5-L7), and three into Lucas Passage (L4-L6), which is tidally restricted and contains seagrass. L5 includes a freshwater wetland, and future phosphorus loads to the wetland would be significantly elevated.
- Seagrass areas around Perulpa Bay (M11-M16), Lucas Passage (M18-M22) and the western shoreline (M26 and M27).
- The freshwater wetlands in the western catchments (M23-M28) all show marginally unacceptable nitrogen and phosphorus concentrations.

On the basis of the percent exceedance and the sensitivity, Table 6.2 lists priorities for action. A series of generic management actions is also listed, which range from vegetated buffers through to major constructed ponds or wetlands. These are based both on the priority and on the scale/shape of the catchment. Figure 6 depicts one possible structure for the treatment of stormwater which could be considered.

All high priority catchments should also be considered for:

- more stringent controls on on-site wastewater systems;
- review of performance of existing on-site wastewater systems;
- early staging of reticulated sewage connection; and
- possible reduction in achievable development density (lot acquisitions particularly where significant infrastructure cost savings have the potential to offset acquisition costs).

For instance, R6, R7 and R10 are very small catchments and the total export loads are relatively small compared to larger catchments. Similarly, narrow catchments which parallel the coast (such as R25) may warrant a series of small pollutant capture devices, whereas wider catchments which have longer drainage lines (such as M5) may be better managed using one or two larger devices.

Approximately 20% of the total catchments have been identified as warranting further study. The analysis used to develop this strategy was quantitative, but was essentially a screening study at catchment level. Designing water pollution control methods in some catchments will require further analysis at sub-

catchment level, so that structures are correctly sized according to the local topography, soils and subcatchment area.

Table 6.2
Priorities for Catchment Management in Catchments Exceeding Benchmarks

Location	Level of Exceedence[1]	Sensitivity	Priority for Management	Proposed Management Actions[3]		
				Major	Minor	Buffer
Karragarra						
K3	✪		Low			√
Russell						
R1	✪	Poorly flushed	Medium			√
R2	✪	Poorly flushed	Medium			√
R3	✪	Poorly flushed	Medium			√
R4	✪	Poorly flushed	Medium			√
R5	✪	Poorly flushed	Medium		√[4]	√
R6	✪✪	Poorly flushed	**High**		√	√
R7	✪✪	Poorly flushed	**High**		√	√
R9	✪	Poorly flushed	Medium			√
R10	✪✪	Poorly flushed	**High**		√	√
R13	✪	Wetland	Medium			√
R17[4,5]	✪	Wetland	Medium		√	√
R18	✪✪	Wetland	**High**	√	√	√
R19[4,5]	✪	Wetland	Medium		√	√
R20	✪	Wetland	Medium		√	√
R22	✪		Low			√
R24	✪	Seagrass & wetland	Medium		√	√
R25	✪	Seagrass	Medium		√	√
Lamb						
L1	✪✪		Medium		√	√
L2	✪✪	Seagrass	**High**		√	√
L3	✪		Low		√	√
L4	✪✪		Medium		√	√
L5[5]	✪✪	Seagrass & wetland	**High**		√	√
L6[5]	✪✪✪	Seagrass & wetland	**High**		√	√
L7[5]	✪✪✪	Seagrass	**High**		√	√
Macleay						
M5	✪✪	Seagrass & wetland	**High**	√	√	√
M6	✪✪✪		**High**		√	√
M7	✪✪✪		**High**		√	√
M8	✪✪		Medium		√	√
M11	✪	Seagrass	Medium		√	√
M12	✪	Seagrass	Medium		√	√
M13[5]	✪✪	Seagrass	**High**		√	√
M14	✪		Low			√
M15	✪	Seagrass	Medium			√
M16[5]	✪✪	Seagrass	**High**		√	√
M17	✪		Low			√
M18	✪	Seagrass	Medium		√	√
M19[5]	✪✪✪	Seagrass	**High**	√	√	√
M20[5]	✪✪	Seagrass	**High**		√	√
M21	✪	Seagrass	Medium		√	√
M22	✪	Seagrass	Medium		√	√
M23[5]	✪✪	Wetland	**High**	√	√	√

Location	Level of Exceedence[1]	Sensitivity	Priority for Management	Proposed Management Actions[3]		
				Major	Minor	Buffer
M24	✪	Seagrass & wetland	Medium	√	√	√
M25	✪	Wetland	Medium		√	√
M26[5]	✪	Seagrass & wetland	Medium	√	√	√
M27[4,5]	✪	Seagrass & wetland	Medium	√	√	√
M28	✪	Seagrass & wetland	Medium		√	√

Notes:

1. Level of exceedance ✪ <50% ✪✪ 50-100% ✪✪✪ 100-150%
2. Priorities - Sensitive catchments with > 50% exceedance and other catchments with >100% exceedance rated **high** priority**;**
   - Sensitive catchments rated **medium** priority; Other catchments with >50% exceedance rated **medium**;
   - All other catchments exceeding benchmarks rated **low** priority
3. Management actions:
   - **Major** =construction of major stormwater controls (eg. large wetlands or retention basins);
   - **Minor** = construction of minor stormwater controls (eg. minor wetlands);
   - **Buffer** = purchase/retention of vegetated overland flow buffers adjacent to waterways/ wetlands.
4. These large catchments warrant a higher priority than would be the case using the above guidelines;
5. Study of export rates, impacts and management options required for detailed design and placement of stormwater management controls.

6.3 Environmental Management

The Russell Island freshwater wetlands will require high priority actions for stormwater controls to attenuate phosphorus concentrations/loads. Earlier field inspections and monitoring data suggested that all of the wetlands are already showing signs of eutrophication. The current sparse populations in the catchments suggests that if the currently possible dwelling densities occur, there will be a very large increase in nutrient exports. The scale of these areas also means that the total nutrient **loadings** from each catchment will be substantially greater than those of other catchments.

Achieving sustainable loads in those areas subject to development will require setting aside vegetated buffers surrounding the wetlands and main waterways, providing stormwater interception ponds and/or wetlands and lowering housing densities. *It is unlikely that a single measure would suffice.*

Precluding development on residential lots in areas of medium, high and very high conservation priority areas is regarded as an important measure to achieving sustainable nutrient loads. This is made particularly feasible where any acquisition or compensation costs can be offset by savings in the cost of infrastructure. Without the ability to reduce potential development levels,

some 71% of the Island catchments are likely to exceed sustainable nutrient loadings (refer to Table 6.1).

The remaining seagrass areas around the islands are restricted to the area north of Russell Island. The preferred land use and development strategy proposes relatively little change to the development densities in the three northern Islands, because most of the catchments do not contain vegetation of conservation priority. Consequently, these catchments will require adoption of a variety of stormwater management techniques if the seagrasses are to be sustained.

In practice, effective nutrient control will require a large number of actions to minimise nutrient losses. These include:

- maximising vegetated overland flow paths for runoff water;
- retaining and enhancing riparian and other catchment vegetation;
- retaining, restoring and constructing wetlands and retention ponds in sensitive subcatchments;
- reducing water velocities and peak flows through detention basins;
- minimising the concentration of stormwater runoff from roads and buildings;
- maximising the opportunity for infiltration of runoff for small runoff events;
- minimising soil erosion in open space, road verges, drainage channels and on construction sites;
- maintaining sewer pipework and minimising effluent surcharge;
- maintaining separation distances between drainage lines and wastewater disposal and treatment areas;
- preventing wastewater disposal in poorly suited locations including those with soils having poor infiltration, high watertable or are close to sea level; and
- promoting public awareness of nutrient control issues including the disposal of organic waste, pet faeces, control of soil erosion, fertiliser practices and maintenance of wastewater disposal systems.

Unless the catchments are well managed, even small population densities have the potential to exceed the target rates for nutrient export.

6.4 Lot Requirements for Stormwater Treatment Measures

Some 47 catchments have been identified as requiring additional stormwater treatment measures over and above those generally applicable across the Islands (ie. retention of vegetated overland flow paths, general use of grassed table drains and retention of high and very high conservation areas).

While the exact nature and extent of the stormwater treatment measure should be the subject of more detailed catchment by catchment analysis, preliminary investigations have identified locations where it may be necessary for Council to acquire lots to accommodate devices such as detention basins, gross pollution traps and artificial wetlands. One possible device is shown in Figure 7.

Wherever possible, treatment measures should be located on existing Council owned land, on land that has a significant drainage constraint and has previously been identified for acquisition or within unutilised sections of the road reserve. Adopting this approach, the additional number of allotments that have been identified for acquisition are as follows:

Russell Island	22
Macleay Island	8
Lamb Island	2
Karragarra Island	0

These lots are shown on Figures 7(a)-7(g).

6.5 Management Strategy

6.5.1 Stormwater

Table 6.3 sets out the achievement measures, actions and priorities for the management of stormwater on the Islands.

Table 6.3
Stormwater Management Strategy

Achievement Measure	Action	Priority
All Catchments		
• Maximise use of natural drainage lines.	• Rezone to preclude development on Residential lots in areas of medium, high and very high conservation areas (some lots on Karragarra Island designated medium conservation priority may be developed - refer Section 5).	H
	• Retain natural drainage paths and avoid the use of kerb and channel on roads.	H
	• Prepare stormwater management guidelines for lots abutting freshwater or intertidal wetlands.	H
	• Undertake regular targeted inspections and aerial reconnaissance of such lands.	M
• Utilise techniques to retard and pretreat stormwater runoff and to increase infiltration of stormwater.	• Implement staged controls (with priority given to the sensitive catchments shown in Figures 4(a)-4(b)) to minimise phosphorus and sediment transport from the catchment, including:	M
	– constructed wetlands and retention ponds – retention of ground vegetated buffer strips – maintenance and replanting of riparian vegetation - including aquatic plants in waterway inverts.	H
• Adopt erosion and sediment control measures for development during construction.	• Review Council's existing sediment and erosion controls to cover all construction activities.	H
• Consider viable alternatives to the release of stormwater into waters with poor circulation.	• Encourage the use of on-site rainwater tanks and soakage pits to reduce runoff.	M
• Encourage rehabilitation of degraded areas, drainage corridors and areas which could provide strategic linkages between conservation areas.	• Liaise with Bushcare and other community groups to identify key sites for rehabilitation.	H

Achievement Measure	Action	Priority
Catchments Draining to Freshwater Wetlands		
• Adopt special measures for development in catchments draining to freshwater wetlands.	Implement additional measures to minimise phosphorus and sediment transport from the catchment, such as householder education on washing practices and detergent purchases.	H
Catchments Draining to Estuarine and Marine Waters		
• Adopt special measures for developments in catchments draining to estuarine areas, tidal creeks and tidal wetlands.	• Implement additional staged controls to minimise nitrogen and sediment transport from the catchment to acceptable levels, including: – foreshore vegetation retention or replanting; and – conformance with guidelines and/or standard approval conditions for earthworks on foreshore blocks	H

6.5.2 Wastewater

Table 6.4 sets out the achievement measures, actions and priorities for the management of stormwater on the Islands.

Table 6.4
Wastewater Management Actions

Policy	Achievement Measures	Priority
On-Site Treatment Systems		
Adopt measures to minimise the contamination of estuarine areas, creeks and wetlands by runoff to surface or ground waters from on-site treatment systems.	• Revise the current on-site effluent management policy to ensure that all new systems are sustainable[1] and that the policy reflects section 33 of the *Environmental Protection (Water) Policy*.	H
	• Introduce water conservation measures for new dwellings such as the requirement for low pressure shower roses.	H
	• Ensure that the policy is performance based to allow for innovative systems and considers both groundwater and surface water impacts.	H
	• Review **all** current installations and require modifications where they are unsustainable.	H
	• In catchments identified as high priority for water pollution control or nominated by JWP for priority staging of sewerage, consider the introduction of more stringent effluent treatment and disposal requirements for on-site systems.	H

Policy	Achievement Measures	Priority
Long Term Effluent Management		
Identify servicing priorities, staging and likely timing for the introduction of sewerage. Investigate future effluent disposal options.	• Adopt the JWP strategy as an interim basis for planning, subject to the modifications proposed in the next two points.	H
	• Conduct a full planning and environmental assessment study prior to deciding on the preferred option for treatment and effluent management. Strong preference should be given to sustainable land based disposal.	H
Alternative forms of on-site effluent disposal for lots over 6000 m^2 and for smaller lots as an interim measure prior to the introduction of sewerage to be assessed on their merits.	• Applicants for alternative on-site disposal technologies will be required to demonstrate the suitability of the technology for use on the Islands.	H

Notes:

1. Sustainable means:
   - no effluent surfacing under any conditions
   - soil type is suitable for the type of disposal system.

2. John Wilson & Partners, 1996.

7. Strategy for Land Subject to Flooding or Tidal Inundation

7.1 Purpose

The purpose of this strategy is to identify those lots affected by overland flow or potential tidal inundation and establish whether or not they are suitable for development. Lots on which development may have direct impacts on system drainage or coastal ecosystems are also identified in this assessment.

7.2 Classification of Drainage Affected Lots

There are some 5,061 lots on the Islands assessed as being affected by overland flow and a further 614 lots assessed as being wholly or partly below RL 2.4 m. This has been adopted as the level below which lots are potentially subject to tidal surge and development has potential to directly impact on coastal ecosystems.

The proposed strategy for these lots relates to the extent they are affected by overland flows or lie below the RL2.4 m development line. Ten categories of drainage affected lots have been identified and these are depicted on Figures 7(a)-7(g). Table 7.1 shows the number of lots in each category on each Island.

Table 7.1
Number of Lots in each Drainage Problem Category

Island		Drainage Problem Category									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	124	162	8	23	4566
Grant Total	**75**	**502**	**468**	**255**	**3789**	**2**	**201**	**413**	**12**	**33**	**5675**

Some 23 lots currently zoned Drainage Problem have been identified as not being constrained by drainage and would be recategorised. These lots are also shown on Figures 7(a)-7(g).

Table 7.2 provides a description of each category together with the implications for the development of lots within each category. Recommended actions which should be taken in relation to lots in each category are summarised. Each action is accompanied by a recommended priority and responsible agency.

Section 7.3 provides further details on how this strategy is to be implemented.

Table 7.2
Strategy for Land Affected by Flooding or Tidal Inundation

Category Description	Development Implications	Actions	Priority
DP0 Drainage Problem Cat 0 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 in the lot which is required to convey the water for up to a Q100 flood event will have an easement for drainage purposes applied. This easement will prohibit the construction of works or any other such activities which may limit the conveyance of stormwater.	• Owners to be advised that an easement will be required over affected properties.	H
DP1 Drainage Problem Cat 1 Lots 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 lots are unlikely to receive building approval.	• All owners should be advised that development is unlikely to be approved on these lots. • The majority of these lots would be acquired and rezoned Open Space or Conservation.	H M
DP2 Drainage Problem Cat 2 Lots 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.	• Owners should be advised accordingly. • A residential development code should be prepared against which applications for these lots can be assessed. • These lots should be given an overlay designation that recognises any development would be constrained by drainage.	H H H
DP3 Drainage Problem Cat 3 Lots 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 lots which cannot be provided with access clear of the Q2 inundation.	These lots are unlikely to receive building approval.	• All owners should be advised that development is unlikely to be approved on these lots. • The majority of these lots would eventually be acquired and should be rezoned Open Space or Conservation.	H H

Category Description	Development Implications	Actions	Priority
DP4 Drainage Problem Cat 4 Lots 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 from DP.	The majority of these lots are affected by drainage problems. They are also likely to be within the conservation priority areas. These lots are unlikely to receive building approval. Lots identified for recategorisation will most likely receive building approval.	• All owners should be advised that development is unlikely to receive building approval on these lots, excluding those lots where existing approvals exists and lots identified for recategorising. • The majority of these lots should ultimately be acquired to facilitate management of conservation priority land.	H L
DP5 Drainage Problem - Cat 5 Identified lots which are required to provide access where existing access to allotments is restricted by Q2 inundation or the access is below RL 2.4 m.	These lots or partial lots are required for acquisition and would avoid the necessity of constructing roadworks in flood-prone and potentially sensitive areas.	• Owners should be advise that their lots, or part thereof, would be required for acquisition. • These lots should be rezoned to Special Use.	H H
DP6 Drainage Problem - Cat 6 Lots which according to topographic data generally have less than 450 square metres of land above RL 2.4 m. This may include allotments which cannot be provided with access above RL 2.4 m.	These lots 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 which 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.	• All owners should be advised accordingly. • These lots should be given an overlay drainage designation which recognises any development would be constrained by drainage. • Lots which become available should be purchased and rezoned Open Space.	H H H
DP7 Drainage Problem Cat 7 Lots where there are more than 450 square metres of useable land above RL 2.4 m.	Development may be permissible with Council approval.	• All owners should be advised accordingly. • These lots should be given an overlay drainage designation which recognises any development would be constrained by tidal influence.	H H

Category Description	Development Implications	Actions	Priority
DP8 Drainage Problem Cat 8 Lots which are required to accommodate the diversion of excess stormwater flows, once the capacity of the road system has been exceeded.	These lots will be required to improve stormwater management and provide for the natural drainage system. These lots have been identified for acquisition.	• Owners should be advised that their lots would be required for acquisition • These lots should be zoned Open Space.	H H
Access Problem Grade (APG) `Cat 9 Lots which do not have access via existing road systems due to excessive grades.	Development may be permissible with Council approval, subject to alternative access being approved.	• All owners should be advised accordingly. • Access to be covered by residential development code.	H H

7.3 Acquisitions

Consideration should be given to the early acquisition of all Residential A lots not suitable for development to enable them to be more effectively managed for stormwater conveyance or as open space. The overall estimated acquisition cost of these lots (Categories 1, 5 & 8) would be in the order of $579,000. This assumes an average cost of $1,000 for each lot subject to natural drainage constraints, and $5,500 for each lot required to accommodate drainage or road related works.

The actual cost would clearly depend on the market value current at the time of acquisition. This latter figure ($5,500) has also been adopted as an average value for Residential A lots in the conservation priority areas.

Those lots required for the installation of stormwater treatment measures discussed in Section 6.4 will also need to be acquired. The estimated cost of acquisition is $320,000 based on an assumed value of $10,000 per lot. This higher nominal value reflects the position of those lots close to the foreshore, whilst still recognising they are likely to be constrained for development due to drainage.

The cost implications of alternative acquisition options are discussed further in Section 14.

8. Economic Development Strategy

8.1 Purpose

The purpose of the economic development strategy is to provide opportunities for the establishment of employment generating uses which recognise the unique location and character of the Islands and which are consistent with the overall Island vision.

8.2 Discussion

Employment opportunities on the Islands are currently limited to a number of small population *serving* enterprises and trades, with the majority of the workforce commuting to the mainland for work.

The Islands' ability to attract population *supporting* economic activity is limited primarily due to access constraints. Such activities would include manufacturing establishments together with industries or professions which serve a wider population than just the residents living on the Islands. Whilst this may be viewed as an impediment to the growth of economic activities on the Islands, it is also a characteristic which contributes to the Islands unique character. In fact, among residents, economic development is seemingly of little concern or value. Nonetheless, growth will bring the need for more economic activities which in turn need to be planned for.

8.2.1 Population Serving Activities

Service activities will be increasingly required to meet the needs of the resident population. Typically, some 30% of the workforce are involved in such activities which include the following:

- convenience retailing;
- local health and welfare services;
- service trade uses (mower repairs, mechanics, hardware stores etc);
- trades (builders, plumbers, etc); and
- education facilities.

Current trends suggest there is likely to be increasing demand for home-based industries. This is a legitimate form of land use and one which is thought to generate a significant proportion of the Island-based employment. Whilst the pattern of development is relatively sparse, these home-based industries are likely to cause little concern to neighbours. However, opportunities will need to be provided for activities such as mower repairs, mechanics etc. to relocate to alternative sites as intensification of development occurs. Such activities

should be centrally located and preferably co-located with shops and other facilities for the convenience of the community and for economic benefits (spontaneous shopping etc.) to the businesses.

8.2.2 Population Supporting Activities

There are several economic activities which could be further developed on the Islands which would be compatible with the Island vision and which have the potential to provide some Island-based employment opportunities. These include the following:

(i) **Day Tripping and Tourism**

Opportunity exists on all Islands (Karragarra being the possible exception due to its small size) for the development of facilities for day visitors and tourism related uses. Day trippers, in particular, are poorly catered for on the Islands. There is need for facilities and tourism related enterprises in walkable distance from the jetties. Opportunity for kiosks, Island interpretation centres and outlets for Island produce should be available and accessible to Island visitors. Also, natural recreation sites further afield need to be linked with improved paths, trails and public transport.

The establishment of cottage industries on the Islands has occurred and could be further developed and integrated with tourism development.

Greater benefit to the Island economy could be expected from longer stay tourism. Bed and breakfast facilities, holiday cabins and eco-resorts offering "retreat" opportunities for mainlanders would be compatible with the Island lifestyle, offering visitors the chance to experience for brief periods of time the lifestyle residents enjoy. Bayside restaurants could also be appropriate uses if properly sited.

However, development of tourism on the Islands should not be to the detriment of Island character and lifestyle, and careful consideration will need to be given to the location and scale of such activities.

(ii) Recreational Boating

The waters of Moreton Bay offer recreational boating opportunities equal to anywhere in Australia. However, there are relatively few facilities for recreational boating in the southern part of Moreton Bay. Temporary moorings and/or limited marina berths which offer associated facilities where provisions could be purchased, or boaters could simply call in to visit Island markets and facilities, are likely to be increasingly required.

(iii)Education/Research Facilities

Establishment of marine or ecological research and education facilities on the Islands would have dual benefits of providing Island employment and facilitating research and education aimed at understanding the sensitive environment in which the Islands are situated. Other uses canvassed at the 1993 Future Search Workshops include fitness/recreation camps, environmental education centre and boardwalks.

8.2.3 Improved Access

A proportion of the Islands residents are likely to commute to the mainland on a daily basis for employment. Indeed, it will be the spending power of these residents which will support a comprehensive range of population serving activities on the Islands. Improved water-based transport and public transport connections at either end will be required to enable residents to access activities and employment on the mainland.

The water-based transport strategy is therefore inextricably linked to the economic sustainability of the Islands.

8.3 Strategy

The following table summarises the proposed measures related to economic development on the Islands together with actions to achieve these measures, priorities and responsibilities.

Table 8.1
Economic Development Strategy

Achievement Measures	Actions	Priority
Provide locations for the establishment of commercial and community facilities and other appropriate non-residential activities.	• Identify sites as part of the preferred land use pattern.	H
Locate major shops and community facilities to service entire Island group in "Island themed" village centres walkable from the jetties on Macleay and Russell Islands.	• Identify suitable locations and designate on preferred land use strategy.	H
Provide opportunity for the establishment of centres which relate to the foreshore and Moreton Bay on Macleay and Russell Islands.	• Identify possible locations and carry out further detailed assessments. • Prepare management plan for each selected site.	M M
Identify precincts which provide opportunities for appropriate tourism, recreational boating and educational uses on all Islands except Karragarra.	• Identify and appropriately designate in the Town Plan as either Comprehensive Development or Tourist Related Uses zoned sites or areas which may be considered for tourism or recreation boating related uses.	H
Promote the Islands as day tripping locations.	• Develop a promotional strategy involving the Island interest groups and Redland's Economic Development Board	M
Provide opportunities for incubator industries related to Island culture or produce.	• Ensure planning controls are sufficiently flexible to enable appropriate home based or incubator industries on the Islands.	H
Provide opportunities for relocation of home based industries which out grow or are otherwise forced to relocate.	• Designate sufficient land around commercial nodes for service industry.	M
Provide outlets for the promotion and sale of Island produce.	• Make provision for sites within walking distance from the Russell, Macleay and Lamb Island jetties for Island enterprises.	M-H
Identify sites on Islands for the possible	• Initiate a program of open space and	H

Achievement Measures	Actions	Priority
development of facilities for day visitor and recreational use.	strategic foreshore access point embellishment and link with walking/ cycle trails. • Investigate the feasibility of kiosk/ interpretation type facilities associated with the development of existing and any proposed public transport jetties around the Islands.	M
Support community groups wishing to promote the Islands cultural heritage and environmental values.	• Assist the RKLM Islands Heritage Group to sign-post and manage sites of cultural or historical significance.	M-H
Develop nature trails along foreshores and in conservation areas.	• Identify linkage opportunities in the open space network, and assist Island Bushcare groups and others to develop and maintain nature trails to link interest points and facilities.	M-H
Identify and protect sites for water access and moorings.	• Liaise with DoE and DPI and develop a water access strategy that incorporates requirements for recreation as well as the water-based transport system.	H
Provide for the establishment of service industries at Centres.	• Designate sufficient land around commercial nodes for service industry on the preferred land use plan.	M
Promote the ongoing development of the water-based transport service to provide convenient access to employment opportunities and essential services on the mainland.	• Implement the Water-Based Transport Strategy.	H

9. Access and Transport Strategy

9.1 General

The need for improved access both between Islands and from the Islands to the mainland is an issue of great concern to the community and one identified as being crucial to the social and economic sustainability of the Islands.

Within the context of the overall vision, it is not envisaged that the Islands will ever offer the level of convenient access to the full range of urban services and facilities available on the mainland. The transport system must be able to provide reliable and ultimately 24 hour access to essential services on the mainland and to the broad range of cultural and recreational opportunities.

An up-graded water based transport system is considered most appropriate for the Islands, linking with coordinated and frequent land based public transport services.

This will mean the development of an integrated transport system, capable of accommodating future growth and providing transport services that are frequent, reliable and fully co-ordinated. The transport system must be economically viable and ecologically sustainable. Subsidies for bus and ferry services warrant further investigation particularly until population and patronage levels which can sustain economic viability and frequent operations are achieved. Subsidies would also help attract patrons to public transport (particularly bus) services, whilst their continued custom would rely on the reliability and convenience of the service.

Whilst the environmental implications of a bridge link to Russell Island are considered more threatening to the long term sustainability of development in the southern part of Moreton Bay, the impacts associated with water based transport will also require ongoing monitoring.

There are two components to the transport system. One is the inter-island and island-to-mainland water-based system. The other is the land based system, both on the Islands and on the mainland.

9.2 Water-Based Transport Strategy

9.2.1 Purpose

The overall purpose of the water-based transport strategy is to provide a framework for the progressive establishment of a water transport system that can meet the demands of future population and visitor growth whilst contributing to the lifestyle enjoyed by Island residents. The water based transport strategy will also provide a framework to justify the longer term provision of marine facilities around the Islands.

9.2.2 Discussion

The water-based transport infrastructure is capable of being progressively upgraded to cater for long term population growth on the Islands. Larger vessels servicing new routes and timetables are feasible and already under consideration. The strategy will need to incorporate measures which encourage further private expenditure on transport infrastructure. The introduction of service contracts to ferry and barge operators is considered critical in this regard.

Upgrading of shore-based landing and carparking facilities at Weinam Creek is due to commence shortly. However a strategy is required to provide a clear framework for the ongoing site selection and capital works related to existing and future shore based facilities (including recreational boating facilities). Consideration also needs to be given to the upgrading of facilities at the vehicle barges. There is a current need for improved queuing areas and upgrading paving. The future use of the public boat ramp located between the two barge ramps needs to be reviewed once the upgrading of facilities at Weinam Creek is completed.

Mainland public transport services connect with the ferries but are often underutilised and according to many residents, not well co-ordinated. Similarly, Island public transport needs further improvement to reduce demand for parking spaces and overall need for cars on the Islands.

Table 9.1 outlines the recommended actions and prioritises related to the water-based transport strategy.

Table 9.1
Water-Base Transport Strategy

Achievement Measures	Actions	Priority
• Identify and assess alternative sites for additional passenger jetties on Macleay and Russell Islands.	• Prepare EIS on alternative Macleay Island sites once terms of reference from DoE obtained. • Identify alternative sites on Russell Island and initiate EIS process.	H M
• Encourage the establishment of new service routes between the Islands and to the mainland.	• Facilitate the development and use of alternative jetties around the Islands for use by operators providing services to Victoria Point or Toondah Harbour.	M
• Continue to promote the introduction of service contracts for Bay Island ferry and barge operators, and other measures to improve security of tenure.	• Liaise with Department of Transport to get service contracts a priority consideration. • Provide long term tenure over mainland and Island jetty facilities.	H M
• Encourage the provision of extended hours of services.	• Consider the introduction of community service obligations as part of future service contract or facility lease with transport operators.	H
• Ensure all Island and mainland ferry nodes are upgraded to encourage and accommodate increased usage.	• Undertake proposed upgrading of the Macleay Island and Russell Island terminals. • Prepare site development plans for passenger facilities at Weinam Creek, Victoria Point and the remaining islands.	H H
	• Prepare site development plan for barge loading	H

Achievement Measures	Actions	Priority
	facilities at Redland Bay. Plan should address access to public boat ramp, queuing and paving requirements.	
• Ensure water based transport facilities are designed to provide equity in access to all users.	• Ensure upgrading proposals and development plans are consistent with the requirements of the Disabilities Discrimination Act.	H
• Ensure the long term environmental sustainability of water based transport.	• Institute monitoring program to establish the impacts of ferry and barge services on the marine and intertidal environment. • In conjunction with operators, review operational procedures and design improvements to limit the impact of water based transport.	H M
• Improve the coordination between water based transport and mainland public transport.	• Review timetables and service frequency with operators.	H
• Provide for increased barge traffic.	• Develop program for the upgrading of barge facilities on the Islands and the mainland.	H

9.3 Land-Based Transport Strategy

9.3.1 Purpose

The overall purpose of the land-based transport strategy is to provide a framework for the provision of a reliable transport system which can reduce the overall reliance on private vehicles on the Island and can meet the demands of future Island population growth and tourism.

9.3.2 Discussion

Whilst the water-based transport system can be upgraded to deliver passengers between the Islands and the mainland, it is the capacity and frequency of both the Island and mainland public transport services which will ultimately determine the viability of the overall transport system.

The on-Island transport system envisaged for the Islands is one of regular shuttle bus services linking with the ferries. Frequent hail-and-ride services or services to designated and well located bus stops would reduce private vehicle use on the Islands and avoid the need for extensive carparking areas in sensitive foreshore locations adjacent to ferry terminals.

On the mainland, transport services to Cleveland and direct to the City at regular intervals would similarly reduce the need for private vehicles on the mainland.

Presently, the number of persons using the mainland public transport service is limited, many residents seemingly preferring to rely on private vehicles kept on the mainland. However, special services that give Islanders convenient access to Cleveland for "pension day" shopping are very much patronised. Parking restrictions at terminals will eventually mean that current trends in private

vehicle usage cannot continue; the challenge will be to ensure adequate services are available to facilitate the move away from private vehicles.

This strategy is consistent with the State Government's Integrated Regional Transport Plan which promotes the use of public transport and other measures (such as car pooling) to reduce overall reliance on private facilities.

Table 9.2 lists the recommended measures to improve land-based transport along with suggested actions, priorities and areas of responsibility.

Table 9.2
Land-Based Transport Strategy

Achievement Measures	Actions	Priority
• Promote the progressive upgrading of public transport services to Weinam Creek and Victoria Point.	• Ensure adequate provision for buses is provided in terminal upgrading plans.	M
	• Limit the future provision of car parking associated with the terminal to encourage greater public transport use.	M
	• Investigate opportunities for overflow parking (for peak periods) in suitable locations away from the Bay foreshore.	M
	• Implement relevant findings of the Redland Regional Transport Study.	H
	• Identify the likely demand for special transport services (eg. pension day services) and promote their further development.	H
• Reduce the reliance on private vehicle transport on the Islands.	• Provide land use and development strategies which reduce reliance on private vehicles, and promote the use of walkways/cycleways, by having shops/facilities within walkable distance to the majority of residents.	H
• Encourage the provision of more reliable on-Island community transport services.	• Review service contracts to negotiate improved levels of service.	H
	• Pursue funding opportunities for a community based transport service in conjunction with the development of the Macleay Islands Community Centre.	M

10. Infrastructure Strategy

10.1 Purpose

The purpose of this strategy is to identify the appropriate level of infrastructure to service the ultimate development of the Islands, the likely cost of such infrastructure and timing for its provision. The strategy also addresses short term needs in relation to wastewater management.

10.2 Sewerage

As discussed in Section 6, management of domestic effluent is critical to the long term sustainability of development on the Islands. Sewerage effluent is a known source of pollutants to the surface water although a comparatively minor source compared to stormwater runoff. The impact of septic tank effluent on ground water and ultimately the receiving marine environments has not been modelled. Such effluent is generally regarded as a significant potential source of pollution.

However, the greatest short term concern is the public health risks associated with inadequate or overloaded on-site effluent disposal systems. The preliminary Sewerage Planning Report for the Bay Islands (John Wilson and Partners, 1996) indicated that on the small (500-700 m^2) lots typically found on the Islands, septic tank surcharging is likely to occur when the dwelling density in the catchment reaches 50% of the maximum yield. There are already several small catchments across the Islands where this benchmark has been reached.

The 1996 report recommended that reticulated sewerage should be introduced once this 50% development density benchmark had been achieved. Existing lot sizes are regarded as too small for sustainable on-site effluent disposal, about one-tenth of the size currently recognised as being required.

Introduction of reticulated sewerage will clearly need to be preceded by an investigation of treatment and effluent disposal options. Whilst high levels of treatment can produce effluent suitable for potable reuse or marine discharge it would be strongly preferable to consider land disposal options.

Whilst Council has recently introduced more stringent controls for septic tank installation, these measures would be insufficient to ensure the safe disposal of effluent once development densities approach the 50% benchmark.

Contemporary alternative on-site treatment and disposal technologies (composting toilets, chemical toilets etc.) are not considered appropriate as a replacement for reticulated sewerage for small residential lots. Generally they only treat one component of the wastewater stream and they rely heavily on owner management.

Alternative on-site systems would be appropriate where sufficient lots have been amalgamated to achieve a minimum area of 6,000 m^2, such as in the medium conservation priority areas on Russell Island.

Staging of Sewerage

The staging of the introduction of sewerage and the management of the effluent are critical to the long-term ecological capacity of the receiving environments. In developing an effluent management strategy, the following measures would need to be considered:

- improvements to any existing on-site treatment installations which have insufficient hydraulic capacity (ie. effluent surfacing can occur);
- requiring that all new installations are sustainable (ie. cause no surfacing of effluent and have no adverse impacts on groundwaters);
- requiring upgrades to on-site systems in high priority catchments (ie. limited ecological capacity of receiving waters to assimilate pollutant loads);
- identify long term strategies/options for the treatment and disposal of effluent associated with a reticulated sewerage scheme;
- the progressive introduction of reticulated sewerage to all small lot areas. A staging strategy would need to be prepared having regard to the technical requirements of the Scheme (location of treatment plant, disposal area, pump stations etc.) and to the desirability of giving priority to those catchments exceeding or nearing the benchmark. It may not be technically feasible to service all the dispersed stressed catchments in the initial stages of the reticulation program. Short term increases in pollutant loads in these catchments is considered acceptable providing they are programmed for ultimate seweraging; and
- once reticulated sewerage is available, limit on-site treatment systems to lots greater than 6000 m^2 in area and where long-term sustainability can be demonstrated.

Table 10.1 sets out the recommended actions in relation to the above strategy.

Table 10.1
Effluent Management Strategy

Achievement Measures	Actions	Priority
On-Site Disposal		
• Improvements to existing on-site treatment installations.	• Inspect existing installations across the Islands and advise owners of potential health risks and remediation actions.	H
• Require all new installations to be sustainable.	• Continue to limit size of dwellings to on-site disposal capacity and enforce best practice requirements. • Introduce measures to conserve water usage.	H H
• Require upgrades to on-site systems in sensitive and largely developed catchments.	• Inspect existing installations in high priority and largely settled catchments and advise owners of potential health/ environmental risks and remediation action.	H
• Require sustainable on-site treatment systems for lots over 6,000 m^2 in area.	• Investigate alternative technologies and prepare specifications for on-site treatment systems.	H
Sewerage		
• Identify long term strategies/options for the treatment and disposal of effluent associated with reticulated sewerage schemes.	• Initiate investigations into the feasibility and environmental implications of alternative treatment and disposal options.	H
• Progressively introduce reticulated sewerage to all small lots.	• Monitor development in each catchment and prepare a staging and development program once findings become available.	H
• Ensure that the impact of sewerage provision is minimised.	• Prepare an environmental management plan to mitigate impacts of reticulation installation and effluent disposal.	H

Costs

The costs of sewering the Islands was estimated in the 1996 Sewerage Planning Study. The costs were based on servicing 15,173 tenements which is some 4,883 serviced tenements more than proposed in the preferred strategy (this allows for 150 unserviced rural residential lots on Russell Island). Cost savings should mainly accrue through reductions in the reticulation network, which as Table 10.2 shows, is most pronounced on Russell Island where no sewerage is proposed in medium conservation priority areas.

Table 10.2
Sewerage Costs

	1996 Estimate	Preferred Strategy
Russell	$31.4M	$24.8M
Macleay	$15.9M	$14.9M
Lamb	$4.1M	$4.1M
Karragarra	$2.0M	$2.0M
Total	$53.4M	$45.8M

Reduce reticulation by 20% on Russell Island and 6% on Macleay Island (based on % of medium conservation priority lots)

The estimates do not allow for the cost of treatment and effluent reuse or disposal. The cost of treatment has been estimated at $1,500 per equivalent tenement (JWP, 1996), total cost of around $15.7M. A further $2.0M could be required for effluent disposal infrastructure.

10.3 Roads

General

Lower dwelling occupancies together with limited destinations is likely to lead to lower traffic volumes on the Islands than would occur in similar sized mainland suburbs. The road network would be designed accordingly, and constructed in a manner which minimises disturbance to the landscape and the need for ongoing maintenance.

Three types of road are proposed:

- 6 metre wide bitumen pavement with kerb and channelling, for limited use in heavily trafficked areas and in strategic locations to control stormwater runoff. Some commercial areas may also require paved shoulders for parking;
- 6 metre wide bitumen pavement with grassed table drains, generally on collector roads which service over about 75 lots; and
- 3.5 metre wide concrete pavement with grassed table drains and reinforced shoulders as residential access streets servicing less than around 70-100 lots.

Whilst these will be the principal road types there will be variations of these to suit specific site conditions.

Whenever possible, the use of kerbing and channelling and stormwater pipes will be avoided, the preferred alternative being the use of overland flow paths to convey (and partially treat) stormwater.

Road Layout

The existing road pattern has been modified to reflect the preferred land use strategy and whenever practicable to achieve the following:

- improved stormwater flow;
- reduced construction costs and maintenance;
- reduced likelihood of through traffic (by introducing cul-de-sacs); and
- reduced impact on vegetation corridors and drainage lines.

Figures 8(a) and 8(b) show the proposed road network.

The roads will be designed to accommodate stormwater flows with shoulder drains shaped and turfed to minimise the propensity for erosion. Where kerb and channelling is required, special structures will be provided to dissipate concentrated flows before stormwater reaches the natural water courses.

Table 10.3 summarises the key elements of the road provision strategy.

Table 10.3
Road Provision Strategy

Achievement Measures	Actions	Priority
• Upgrade roads to a standard which provides safer, cost-effective all-weather use, is in keeping with the landscape character and is low maintenance.	• Initiate detailed design of a road network incorporating the following: – sealed major roads with 6 metre bitumen surface and minor roads with 3.5 metre concrete surface; – use of kerbs and channels in limited locations only (such as commercial centres) to carry stormwater runoff; and – use of grassed swale drains and natural drainage paths.	H
• Ensure all services are provided in a manner which reduces tree removal, earthworks and erosion potential.	• Ensure design includes: – minimal road formation works to enable tree retention in road reserves; and – use of pipes and culverts for stormwater conveyance. • Review procedures to ensure areas disturbed by contractors or Council during the construction of roads and engineering services are re-established.	H H

Table 10.4 shows the total length of roads to be constructed on the Islands.

Table 10.4
Road Requirements

Island	Bitumen 6 m wide (km)	Concrete 3.5 m wide (km)	Total
Russell	16.1	58.6	74.7
Macleay	18.1	28.2	46.3
Lamb	1.8	6.1	7.9
Karragarra	0	2.6	2.6
TOTAL	**36**	**95.5**	**131.5**

The existing paved roads on each of the Islands have been excluded from these calculations. By Island, the existing paved road length is as follows:

- Russell 23.2 km
- Macleay 10.5 km
- Lamb 2.4 km
- Karragarra 1.9 km

Staging

Construction priority should be given to the spine or collector roads. Priority for the upgrading of access streets should be related to the level of development. Council currently intend to undertake the upgrading process over a 3 year period by releasing packages to contractors. This accelerated program would be partially funded by the Infrastructure Levy and partially by general rates. Under these circumstances, no staging of roadworks is required.

Costs

An estimate of the overall cost of road upgrading for each of the Islands is summarised in Table 10.5.

Table 10.5
Estimated Road Upgrading Costs

Island	Bitumen $M	Concrete $M	Total $M
Russell	6.3	13.5	19.8
Macleay	7.1	6.5	13.6
Lamb	0.7	1.4	2.1
Karragarra	0.1	0.6	0.7
TOTAL	**14.0***	**22.0**	**36.1***

*Adjusted for rounding.

10.4 Water Supply

All of the islands are serviced by reticulated water supply. Russell Island received full reticulation to all developed lots in 1990 with the remaining islands receiving reticulation in 1996. Macleay, Lamb and Karragarra Islands are fully reticulated.

The Russell Island reticulation network currently services all of the developed lots. Redland Shire Council undertakes to provide a water service to any new developments following the building permit application within the period of construction.

Strategy

Provision of water supply infrastructure on Macleay, Lamb and Karragarra Islands is essentially complete. Ongoing provision of reticulation on Russell Island should have regard to the preferred land use strategy and environmental conservation strategy. In particular, the following actions are recommended:

- the water reticulation network should be designed to avoid those areas identified as having high and very high conservation priority;
- the network should reflect the development potential of the Island and be designed to avoid the need for reticulation mains through areas which are not intended for development;
- network design capacity should be revised by Council in accordance with the preferred strategy; and
- contractors should be required by Council to reinstate areas disturbed during the installation of services.

10.5 Electricity Reticulation

The South-East Queensland Electricity Corporation (Energex) is the responsible authority for providing electricity to the Islands.

The dispersed nature of development on the Islands has made it difficult to equitably reticulate electricity across the Islands, as the costs would have been borne by the earlier residents only.

Redland Shire Council subsequently negotiated an agreement with Energex to supply electricity to any property on the Islands without a connection charge. Energex would recover 22.5% of this cost over the 10 year agreement period by charging households for power. Council imposes an annual levy on all land owners on each Island, to recover the remaining costs. The extent of the levy is related to the extent of reticulation and number of consumers.

The service agreement was for ten years which is due to expire in the 1998/1999 financial year. It is expected that Lamb, Karragarra and Macleay Islands should be virtually fully reticulated by then. The levy will cease on the completion of reticulation to these Islands.

In the case of Russell Island, the demand for electricity connections has been below expectations and it appeared that the substantial implementation of electricity services would not be realised within the period of the agreement. As a result of the relatively lower population density on Russell Island, the revenues received by Energex from Russell Island residents were far below expected levels. In 1996 Russell Island was removed from the original agreement and a further 5-year agreement was re-negotiated. This agreement is due to expire in 2002 with the expected timing for the completion of reticulation.

The Russell Island agreement provides for the payment by Redland Shire Council to Energex of lump sum amounts which represent 22.5% of the actual costs of the connections. The actual costs used were calculated on the basis of estimates of the remaining works to be carried out to complete the reticulation system.

10.6 Waste Management

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.

11. Human Services and Community Development Strategy

11.1 Purpose

The purpose of the human services and community development strategy is to identify an appropriate range of human services to cater for the long term well-being of the Island community and identify initiatives and actions to achieve these. The strategy also recognises the importance of empowering the community to achieve greater levels of self-help and proposes a number of shorter term community development initiatives in this regard.

11.2 Discussion

The ability of a community to access the necessary range of facilities and services is an important indicator of social sustainability, along with level of social and economic well being (eg. basic quality of life) and overall sense of community.

It is clear that at the present time there is a significant barrier to the residents of the Islands assessing what is considered to be the "normal" range of community facilities and services necessary to sustain the social health of the community. The situation is exacerbated by the fragmentation of the community across the four Islands and the fact that each community seeks individual treatment and has differing expectations and needs. This complicates service delivery and makes it difficult for service agencies to identify the type of service or facility and a location for it that has the support of the majority of Island residents. The Macleay Island Community Centre is a case in point, being designed to service the entire population of the Island group but seemingly receiving little support from residents not living on Macleay Island.

There are significant gaps in the existing range of facilities and services which would be available to an urban community. This raises the question of whether the expectation that these facilities and services should be available is warranted or otherwise. As mentioned elsewhere, the concept of providing an alternative lifestyle clearly implies a trade-off between Island living and urban level of services.

All service providers have difficulty in providing services to the Islands. The Bay Islands do not fit within the existing models for service provision, being neither a rural nor a remote community. This puts the Islands at a distinct disadvantage having to compete with other urban areas when it comes to the allocation of scarce resources across the entire State.

The position in relation to the Islands has perhaps been most clearly expressed by Education Queensland. The extraordinary growth of South East

Queensland across a number of fronts has meant that the Department of Education has been forced to develop rigorous policies for distributing resources equitably and efficiently.

These policies centre on the concept of concentrating and sequencing growth to avoid a multiplicity of growth points, and in some cases the provision of small and inefficient schools which are extremely expensive to provide and use an inequitable proportion of the education budget.

The view of the Department is that the Islands represent dispersal of growth at its worst, and that the provision of additional services on the Islands would be both out of sequence and attempting to serve an inefficient place for population growth. Education, along with other agencies, holds the view that lifestyle choice is not a valid criterion for determining service priority.

A desirable outcome of the strategy would be for all agencies to agree to classify the Islands as "remote/rural" which will open up opportunities for funding. This does not have to be a permanent classification, but put in place until sufficient population has been achieved, which can sustain a greater range of services, and until greater levels of interaction between the Islands make alternative service provision models (as discussed below) more feasible.

Alternative or Innovative Service Strategies

The preferred strategy would result in an overall population of around 21,000 residents, about one half to two thirds of the ultimate population that could have been anticipated without intervention. Significant savings in social infrastructure provision will result from this strategy, although a longer term strategy for an appropriate level of infrastructure provision will still be required.

One option is to set up alternative or innovative methods of service provision to suit a "dispersed" model such as the Islands. The use of alternative or innovative strategies accords with the trends in modern community services planning, again in response to restrictions in funding resources.

A technique which is commonly used in urban areas is the provision of multipurpose centres, where a variety of activities can occur, but also where a variety of service providers can visit to provide services on a sessional basis. Such models often depend on the cooperation of community sector organisations, usually with local government.

Models are rarer of State and Commonwealth Government agencies combining resources to establish and operate centres; although there are some recent exceptional examples of cooperation, eg between health authorities and schools. Some innovative models in South Australia combine State, local and community sector purposes (eg. Churches) in one building.

A possible model which could be developed in a dispersed community (and over time the Island community) could incorporate elements of the above with a model recently adopted by the Office of Rural Communities, Department of Local Government and Planning, through the Queensland Government Agent

Program (QGAP). This program provides a new way of delivering services to small rural communities where there are few government agencies. The program was established as an economically viable service delivery option to ensure that residents in rural communities would have easier access to the variety of Government information and services that are readily available to those living in large urban areas. There are currently 28 "one-stop-shops" under QGAP providing a wide range of State Government transactions, information and referrals. Some of the services provided at Queensland Government Agent Offices include:

- Department of Transport - vehicle registrations, licensing, traffic offence notices;
- Queensland Ambulance Service - collection of ambulance subscriptions and payment;
- Department of Public Works and Housing - waiting lists for public housing, allocation of housing, rental matters, maintenance, property inspections;
- Workers Compensation Board - application forms, assistance and advice;
- Department of Justice - forms and information on acts, electoral rolls;
- Office of Consumer Affairs;
- Public Trustee of Queensland;
- Queensland Treasury;
- Department of Environment; and
- general enquires and information for all Queensland Government Departments.

These Queensland Government Agents are recognised as the point of contact for government assistance in their communities. A similar one-stop-shop is considered appropriate for the Islands.

QGAP does not cater for those health and welfare services requiring medical or health related professionals. This does not mean that such services should not be co-located at these centres.

This model is only applicable to communities which have achieved some degree of self sufficiency, being designed to reduce the need for trips outside the local community and leakage of expenditure usually associated with such trips. As such, it is viewed as part of a longer term strategy for the Bay Islands.

Improved Access

A further measure is "bringing the people closer to the services". Clearly, any improvement in transport between the **islands and the mainland** will increase accessibility to services which already exist on the mainland.

The Islands themselves should be regarded as a planning unit for the purposes of considering service thresholds, which would also require stronger dependence on **inter-island** transportation. This way it would be possible to provide community facilities or services on Russell and/or Macleay Islands

(commensurate with the expectations of residents on these islands, and absent landowners) to which residents on other islands would still have reasonable access.

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, with a second generation of untrained and unemployed family members. Social sustainability, particularly in terms of employment, but flowing through into adequate housing, financial security etc is unlikely to occur on the Islands without a substantial improvement in access. Having stated this, social sustainability is only one component of overall ecological sustainability and strategies must be balanced with environmental and economic considerations. Better and affordable communications are also considered a social imperative.

Sense of Community

Finally, it is considered critical to social sustainability that a strong sense of "community" and indeed self-help is adopted on the Islands. Sustainability by its very nature in fact requires a belief in and identification with the notion of community, ie. the larger collective society to which individuals belong, which creates their norms and regulates their social behaviour.

A strong collective sense of community has not yet emerged on the Islands. While a number of community groups have emerged on each of the Islands, together with a number of whole-of-Island interest groups promoting causes common to the four Islands (notably youth activities and cultural heritage), there appears to be little cohesion between these groups. As a result, the Island community as a whole is not well represented, united or empowered to promote community development on the Islands.

The community has united for brief periods over important issues (most recently the Infrastructure Levy), but interest eventually wains and momentum lost. Cohesive and empowered communities are often those which achieve highest levels of accessibility to services and facilities and an overall greater sense of well-being.

Whilst communities are primarily social constructs, they are powerfully reinforced and framed by the physical elements of landscape, townscape and urban design. Part of creating a community consequently involves creating identifiable physical communities, with real centres in which people are drawn together, and public spaces for communal activity. Above all, however, if communities are to develop, the more people that are involved in their creation, the more likely they are to belong to the communities that arise.

Clearly, better relationships with Council are required, but Islanders also need to feel a part of the Shire, and that they are involved in the decision making which affects their part of the Shire.

Lastly, while Council has been involved in various community development initiatives on the Islands and in fact spent more resources per capita on the Islands than anywhere else in the Shire, there will be a need for ongoing

commitment to resourcing the communities of the Islands. The provision of seeding grants for community projects and cultural initiatives, support, guidance and coordination in terms of community management and activities, and ultimately, contribution to funding workers who can work with the community to help them to help themselves. This concept is considered critical to establishing a viable, sustainable social environment on the Islands.

The Dispersed Model

While a key element of the human services strategy in the short term will be to have all agencies classify the Islands as "rural and remote" to enable funding for some initial services, in the longer term the recommended model for the provision of services is the "dispersed model". The ultimate population under the preferred scenario is around 21,000 residents, the population being dispersed among the Island group. A dispersed model bears similarities to the situation in a rural residential area, and also to the difficulties of service planning on a regional basis where there are multiple urban centres.

Previous models along this line have been premised on the following:

- a spread of services across the region (in this case, the Islands);
- strengthening local communities so they are better equipped to support each other;
- sharing infrastructure, resources and facilities;
- active linking of services across the region and use of available technology to increase access to services; and
- acknowledging local differences and tailoring services to local needs.

They also usually base their service delivery on a hierarchy of local, secondary and major centres.

Baseline Level of Service

It would appear appropriate in the case of the Islands that the concept of strengthening a local community is applied to islands such as Karragarra, and Lamb, where residents have a preference for little or no development, and no or minor increases in facilities or service to bring them only to a baseline level.

On this basis, all Islands should have at least a baseline of community facilities and services, which encourages community development and local support networks. Generally there would not be external service provision, unless visiting, but information, training, support and referral would be available at higher order centres (islands).

The concept of baseline facilities and services has been relatively well developed. Recent trends suggest the use of the application of performance criteria to determine facilities and services which should be provided, rather than specification of particular facilities and services.

In other words, the approach to determining appropriate facilities and services should be subject to local alternatives and solutions to meeting performance criteria. The suggested baseline criteria are:

- a place (or places) for the community to meet;
- some form of child care/children's play area;
- an office or other suitable space for community workers or visiting specialists; and
- access to a neighbourhood shop.

Clearly these can be met in a variety of ways and at vastly differing costs and scales, dependent upon the size and values of the community.

It would also appear relevant, in the case of the less developed islands, that it is ensured that basic elements of physical infrastructure are provided, so that on-island access to services is available. In the case of the Island communities these could include sealed roads, shelters, storage/garaging facilities, public telephones etc.

A significant increase in basic inter-island transport is integral to this strategy to ensure access to the next level of services on adjacent islands.

Moderate Level of Service

A moderate level of service provision should be adopted on Macleay Island (possibly Lamb in the longer term). This would reflect the existing higher level of population on that island, and the expectation of some higher level provision of amenities, but respect the values of residents who generally favour no development, or, if necessary, slow and controlled development.

The level of service to be established should reflect the potential role of the Island in servicing outlying Islands with essential services. Many of these could be provided from a multipurpose facility. Identification and addressing of local needs will depend on the support and initiative of local residents, with resourcing and coordination by local and state agencies.

It is recommended that performance criteria for this level of service should include:

- a multipurpose facility which can serve the diverse human service needs of a small community (the proposed community centre may be able to fulfil many of these needs);
- coordination of local services, activities, community information and facility management (eg. by a community development officer);
- liaison with and technological access to wider district level community services and government agencies;
- development of activities for specific target groups in the community, eg. youth;

- adequate arrangements for response to emergency situations;
- active recreation facilities appropriate to a range of age groups;
- access to a neighbourhood shopping centre.

Again, improvements in physical infrastructure which will facilitate on-island, inter-island and island-mainland transport, will be necessary to ensure access to higher level facilities and services. This might include footpaths and walkways, sealed roads, street lighting, public phones and other forms of communications.

Major Level of Service

The highest level of service on the islands should essentially be determined by the population threshold reached by the Island group (similarly to a region) as a whole. This level of service would appear appropriately located on Russell Island, where residents and absentee landowners seem to support some development accompanied by an increase in available amenities.

The facilities and services to be provided based on the ultimate population are likely to include:

- extension of primary school facilities;
- access to higher order shopping facilities (appropriate to size of population);
- a range of recreation settings and leisure opportunities for all age groups;
- a multipurpose community facility which can serve district level human service and possibly community health needs;
- coordination of district and local level human services, activities, information and facility management;
- provision of specialised community advice and developmental services targeted to specific groups in the community eg youth, the aged, etc.;
- liaison with and technological access to wider regional level community services networks;
- access to government mainland services (eg. by a one-stop-shop type arrangement);
- an urban range of emergency services, available to support limited services on other islands;
- access to Redland Shire's library services;
- expression of the Island's cultural and social values; and
- access to TAFE and other training programmes possibly in conjunction with a secondary school.

The provision of such facilities on Russell Island would serve as the district level type facilities for the Bay Islands as a whole, providing essential health, community development and education facilities, and stimulating the development of support services and community activities. However the

effectiveness of these functions would be dependent on improved inter-island transport, and also improved transport between Russell Island and the mainland. Access to higher order specialist, large scale and regional services (eg hospitals, universities) would still be to the mainland.

The priorities for establishing facilities such as those above, eg. further primary and secondary schools, would need to be established in competition with those in all other growth areas of the state, and in sequence with growth in the Redland's area generally. If growth is slow it is likely that such facilities would not be established for some years. Joint use, co-provision and co-location of facilities should be pursued in reaching local service solutions wherever possible.

It should be noted that the Department of Education currently has no plans for a secondary school on any of the Islands and would be reluctant to provide a school to serve a relatively limited catchment. Small secondary schools can not offer the curriculum of larger schools and, on a per student basis, are more expensive to operate. Any future decision on a secondary school would need to be mindful of the above and the capital and recurrent costs weighed against future transport subsidies for students to attend mainland secondary schools. Broad costings are further discussed in Section 14.

11.3 Strategy

Suggested short term and longer term actions related to the delivery of services to the Islands are summarised in Table 11.1.

Table 11.1
Human Services Strategy

Community Development Initiative	Actions	Priorities
Immediate Term Strategy		
• Encourage greater interaction of Island communities.	• Promote activities which have interest to a wide cross-section and encourage interaction by rotating venues and subsidising transport.	H
• Encourage establishment of whole of Island Community Group.	• Consider ongoing role and functions of Bay Island Community Services Working Party and the Community Reference Group.	H
• Seek ways to involve community in decision making.	• Consider having occasional Council meetings on Islands.	H
• Encourage special projects/events to lift Island profile and community esteem.	• Sponsor a sustainable dwelling/lifestyle initiative on the Islands and seek wide promotions.	H
	• Sponsor an Island Festival or similar event and rotate venues between Macleay and Russell Islands.	H
• Seek funding for basic facilities and services through agencies.	• Liaise with service agencies to achieve common classification of the Islands to "remote rural".	H
Longer Term Strategy *Baseline Service*		
• Provide place(s) for the community to meet.	• Liaise with residents of Lamb and Karragarra Islands to identify need for and type of community meeting place.	M
	• Adopt a land use strategy which provides for the establishment of community focal points (or centres).	H
• Provide child care/ childrens play area.	• Liaise with community to establish need and suitable locations for play areas, preferably adjoining community meeting places and other venues.	M
	• Liaise with Department of Education regarding insurance requirements for out-of-hours use of school playing fields.	
• Provide suitable space for community workers or visiting specialists.	• Consider joint use of community meeting areas for visiting service providers.	M
Moderate Level of Service		
• Provide multipurpose facility to service human service needs of small community.	• Progress the establishment of the proposed multipurpose facility on Macleay Island.	M
	• Review the utilisation of Russell Island Hall by all groups.	M

Community Development Initiative	Actions	Priorities
• Co-ordinate local services activities, community information and facility management	• Consider the nomination of a community development officer associated with the provision of the Macleay Island Community Centre and outreaching to other Islands.	M
• Provide access to wider district level community services and government agencies.	• Liaise with DLGP Office of Rural Communities for assistance under the Queensland Government Agent Program (QGAP) for the establishment of agencies services on Macleay Island.	M
	• Investigate alternatives for providing improved inter-island transport in association with the Macleay Island Community Centre.	M
• Develop activities for specific target groups.	• Ensure representatives from specific groups are consulted in relation to the provision of community and recreation facilities on the Islands.	H
	• Provide assistance to community groups (such as the Bay Islands Youth Association) in achieving access to appropriate facilities.	H
• Ensure adequate arrangements for response to emergency situations.	• Continue liaison with Queensland Ambulance Service for the location of permanent ambulance officers on each Island dependant upon the population of the area.	H
	• Support the establishment of community network of care providers.	H
	• Liaise with the Queensland Council of Carers for the provision of respite care.	M
	• Identify central location for the potential establishment of joint Ambulance and Fire Service depots on Russell and Macleay Islands.	M
	• Finalise the completion of Counter Disaster and Community Recovery Plans for the Islands.	H
	• Ensure Rural Fire Brigades are adequately resourced.	H
• Active recreation facilities for a range of age groups.	• Make provision for the development of active open space in the land use strategy.	H
	• Consult with the community over priority facilities to be included in Macleay Island Community Centre.	H
	• Identify suitable locations and prepare management plan for boat ramps and associated facilities.	M
• Access to a neighbourhood shopping centre.	• Provide for neighbourhood centres in land use strategy.	H
Major Level of Service		

Community Development Initiative	Actions	Priorities
• Extension of primary school facilities.	• Monitor school enrolments, demographic trends and primary school requirements.	M
• Provision for secondary school preferably in conjunction with community or recreation facilities.	• Review the suitability of the existing site and identify potential alternative future site(s) on Russell Island as part of land use strategy.	M
	• Monitor demographic trends and school enrolments at Victoria Point State High School.	M
• Access to higher order shopping facilities.	• Provide for major neighbourhood centre on Russell Island in land use strategy.	M
	• Identify likely demand for special transport services for mainland shopping.	M
• A range of recreation settings and leisure opportunities for all age groups.	• Provide opportunities in land use strategy for linked parks, playground and playfields.	H
	• Establish opportunities for walking and cycling trails.	H
	• Continue to explore further opportunities for providing specific facilities such as shared carparks/basketball courts/tennis etc.	H
• Provide multipurpose community facility for district level human service and community health needs.	• Identify possible locations for a multi purpose facility on Russell Island as part of land use strategy.	M
	• Liaise with range of government agencies to discuss possible long term co-location project.	M-L
	• Promote the early completion and use of proposed Macleay Community Centre as the primary centre for the Islands for the foreseeable future.	H
• Provision of specialised community advice and developmental services targeted to specific groups eg. youth, the aged etc.	• Liaise with Department of Families, Youth and Community Care.	M
	• Ensure Council's Community Services officer targets Island groups as part of normal duties.	M
	• Ensure provision for existing community support groups (eg. Bay Islands Community Services) is made in multi-use centralised facilities.	M
• Liaison with and technological access to wider regional level community services networks.	• Liaise with QDLGP regarding assistance under the QGAP program.	M
• Access to mainland government services.	• Discuss and negotiate communication options with State Government/including telephone (not STD) and electronic options.	H
	• Promote the upgrading of water based transport and implementation of transport strategy.	H

Community Development Initiative	Actions	Priorities
• Provide urban range of emergency services available to support limited services on other Islands.	• Assess suitability of existing sites or identify possible alternative sites on Russell Island for future establishment of joint emergency services depot.	M
• Access to Redland Shire's Library Services.	• Review current library services on each Island and establish future servicing strategy.	M
	• Consider electronic options as part of communications strategy.	M
• Expression of the Islands cultural and social values.	• Foster community based cultural development and cultural heritage initiatives and provide seed funding.	M
	• Develop cultural heritage strategy (refer to Section 12).	
• Access to TAFE and other training programs.	• Investigate opportunities for shared use of existing or proposed facilities for TAFE and Training Courses.	M

12. Cultural Heritage Strategy

12.1 Purpose

The purpose of the Cultural Heritage Strategy is to give recognition to the pre-European and early European occupation of the Islands and to ensure the protection and ongoing management of sites and places of indigenous and historic cultural significance.

12.2 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. Representative Aboriginal Bodies (RABs) may be involved in any such negotiations. 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 programs 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.

The *Queensland Heritage Act 1992* provides additional legislative controls for the protection of historic places and environments entered on the Heritage Register, established under 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:

D*o as much as necessary, as little as possible.*

The draft National Heritage Standards provide 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; define the characteristics and attributes for best practice in heritage conservation; and develop procedures, processes and protocols which aim 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.

12.3 Aboriginal Cultural Heritage

Indigenous cultural heritage includes archaeological sites and places containing evidence of ancient Aboriginal occupation such as shell midden sites, quarry sites and burials. Indigenous Cultural Heritage also includes places of anthropological significance in accordance with indigenous tradition and social significance in accordance with concepts of Aboriginal social and cultural identity. Such places include but are not limited to story places, creation sites, ceremonial places, special resource areas and cultural landscapes.

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. The following strategy recommendations prepared by the University of Queensland in conjunction with the Quandamooka Land Council reflect these findings.

Significance and Management Criteria

Significance assessment practice in cultural heritage management focuses on three types of significance:

1. *Scientific significance* - the value of the place for research or as a representative sample of threatened site type (usually archaeological, anthropological, or historical significance);
2. *Owner significance* - the value of the site or place to the community which has ownership of the resource (termed Aboriginal significance when dealing with Aboriginal heritage places);
3. *Public significance* - the value of the site or place to the wider general community.

Significance is determined by the careful consideration of the value of a site or place in terms of the above three types of significance.

It is common to find that preferred habitation places occupied by Aboriginal people in the past coincide with the preferred habitation places for development today. Consequently, a realistic approach to heritage management sometimes requires that even highly significant sites and heritage places need to be managed in an environment which is threatened by development.

For these reasons, the significance ratings of cultural heritage sites have been separated from management categories. 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). 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 that require absolute protection through acquisition and/or conservation zoning.
Management Category 2	Sites and places are in areas with low development impact that require implementation of land use planning controls to 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 12.1 provides a summary of the significance ratings and management categories for the known sites and heritage places on the Southern Bay Islands. Figures 9(a) and 9(b) show the location of areas which are of highest cultural heritage significance not already included in significant conservation priority areas.

Table 12.1
Significance Ratings and Management Categories of Known Indigenous Cultural Heritage Sites and Places

Site Name	Significance Rating	Management Category
Russell Island		
Giant'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

Site Name	Significance Rating	Management Category
Lamb Island		
Clarke's Point to Lamb's Head	2-3	1-3
Pebble Beach	1-4	1-3
Jeffs 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

12.3.1 Management in Areas Subject to Development

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, a series of broad principles and strategies designed to avoid unnecessary site destruction and to minimise damage to sites and heritage places, has been developed by the University of Queensland in conjunction with the Quandamooka Land Council. These are in accordance with the definitions of Management Categories 2-4.

Principles

General principles for the management of cultural heritage in areas subject to development are as follows:

- Aboriginal land use stories and practices be recognised in the planning and management of Southern Bay Islands development.
- The need to minimise human impacts on the environment as a whole, particularly in those areas associated with swamp and marine resources and high country story places, should be reflected in planning and management processes of Southern Bay Island development.
- The Redland Shire Council and the Quandamooka Land Council Aboriginal Corporation (QLCAC) should jointly develop background heritage studies for the Southern Bay Islands as a part of the Native Title Agreement process.
- In recognition that any ground surface disturbance on the Southern Bay Islands may damage cultural material, where possible, development should be preceded by survey and/or monitoring.

- Redland Shire Council and QLCAC jointly educate developers (large and small), alerting them to the existing and potential sites and heritage places, their obligations under the *Cultural Record (Landscapes Queensland and Queensland Estate) Act 1987*, and any provisions and regulations of Council regarding voluntary conservation agreements.

- All development activity should be confined to the lot on which development approval has been granted, and that Council inform developers of this requirement and Council's commitment to enforce it.

Strategies

Strategies for the management of cultural heritage in areas subject to development are as follows:

- For multiple block developments or developments on large blocks of land, Council facilitate an onsite meeting between the developer and a person nominated by QLCAC to discuss the development, to review planning for appropriate cultural heritage management and building development, and to foster goodwill.

- For multiple block developments or developments on large blocks of land, require that site works supervision by a person nominated by QLCAC is a condition of development. This person will monitor development and take appropriate action in the event of cultural material being found. Council would work with QLCAC to develop acceptable policies and practices with respect to monitoring activities.

- For small scale and individual block developments, Council would work with QLCAC and other relevant community groups (eg. RKLM Heritage Group) to promote community awareness of heritage and to develop incentives to encourage individuals to help maintain cultural heritage sites and places (eg. via voluntary conservation agreements, rate relief, etc.).

- Redland Shire Council and QLCAC jointly develop strategies for implementing an appropriate program of cultural heritage management on individual blocks.

12.3.2 Strategies for Known Sites

Table 12.2 below lists the proposed actions for the protection and management of the known indigenous cultural heritage sites and places on the Islands.

Table 12.2
Strategy for Protecting Known Sites and Places of Indigenous Cultural Heritage

Site	Action/Status	Priority
Russell Island		
Giant's Grave	Currently protected in very high conservation priority area.	-
Browns Bay Middens	Currently protected in very high conservation priority area.	-
Turtle Swamp Middens	Currently protected in very high conservation priority area.	-
Kibbinkibbinwa Point	Currently protected in high conservation priority area.	H
Oyster Point	Council should negotiate with landowners regarding further research and management options. Liaison with landowners and Quandamooka should be carried out to define areas that warrant protection through acquisition.	H
Bora Grounds (3 sites)	As above.	H
Rocky Point Middens	As above.	H
Other possible midden sites	All development in coastal areas should be undertaken to ensure middens are not damaged unnecessarily (refer to Strategies in Section 12.3.2).	H
Resource Areas		
Turtle Swamp	Currently protected in very high conservation priority areas.	-
Story Places (not subject to development)		
South of Tamlin Drive generally	This area is of high cultural heritage significance and wherever possible should be acquired or development managed to reduce impacts. Rocky Point should be a priority area for cultural heritage conservation and appropriate areas should be defined for acquisition through liaison between landowners and Quandamooka.	H
Turtle Swamp and Land Eastwards	This area is generally protected as high to very high conservation priority.	-
Macleay Island		
Corroboree Point	Continue to manage as park.	H
Point Perrebinpa to Point Pininpinin	Owners of lots suitable for development should be encouraged to identify and maintain cultural heritage sites (refer to Strategies in Section 12.3.2).	H
Midden and Burial Sites Perulpa Island	Designate high conservation priority areas and adjacent land up to lot boundaries as having high cultural heritage significance.	H
Reburial Location Perulpa	Currently protected as very high conservation priority	

Site	Action/Status	Priority
Island	area.	
Coondooroopa	Parts of area protected as very high conservation priority. Remaining areas outside lot boundaries should be designated as having high cultural heritage significance.	H
Tim Shea's Waterhole Midden	Waterhole is currently protected in very high conservation priority area.	-
Thompson's Point	Prepare site management plan for protection of Kanak Wharf.	
Story Places		
Eastern side of Macleay Island, north of Perulpa Bay	Designate area as having high cultural heritage significance.	H
Lamb Island		
Clarke's Point to Lamb's Head	Most of area is already protected as conservation priority area. Shoreline and coastal fringe areas up to existing property boundaries should also be protected through designation as high cultural heritage significance.	H
Pebble Beach	Most of area is already protected as conservation priority area. Shoreline and coastal fringe up to existing property boundaries should also be protected through designation as high cultural heritage significance.	H
Jeff Ward's Midden	Currently protected as very high conservation area.	
Ian Ward's park Road Reserve and Wellers Bush Care midden	Currently protected as high/very high conservation area.	
Thomas Lucas Waterhole Midden	Refer to management strategies in Section 12.3.2.	
Story Places		
SW of Lamb Island, opposite Corroboree Point on Macleay Island	Designate area as high cultural heritage significance.	H
Central Eastern side of Lamb Island	Designate area as high cultural heritage significance.	H
Karragarra Island		
Possible shell midden (eastern end)	Area currently protected as high/very high conservation priority.	-
Midden (western end)	Upgrade conservation priority at western end of Island to reflect high cultural significance of this midden and significance as a resource area and story place.	H

12.4 Historical 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 12.3 and shown on Figures 9(a) and 9(b).

Heritage Conservation Strategies

The following actions are proposed to ensure the ongoing protection and management of historical cultural heritage items on the Islands:

- develop formal mechanisms for heritage conservation planning in Redland Shire in accordance with the National Heritage Standards;
- establish a Redland Shire Heritage Advisory Committee responsible for the provision of advice to Council on the identification, assessment, management and conservation of heritage sites and places, where appropriate. Such advice may include, but should not limited to:
  - cultural heritage mapping,
  - site management,
  - public education,
  - site signage,
  - site conservation needs,
  - local and regional heritage conservation objectives, and
  - priorities for acquisition;

- list all of the historical cultural heritage sites listed in Table 12.3 and the indigenous cultural heritage sites listed in Table 12.2 on the Redland Shire Heritage Register;
- record and identify places listed on the Shire Heritage Register on appropriate Council management documents such as rate notices and the Town Plan.

Table 12.3
List of Historic Sites

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

Site Name	Site Type	Community Significance	Heritage Significance
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)

13. Preferred Land Use Pattern

13.1 General

To help achieve the overall vision of life on the Islands and in response to the previous strategies which collectively aim to achieve ecologically sustainable development, a preferred pattern of land use has been prepared for each of the Islands.

The preferred land use pattern, shown in Figures 10(a) and 10(b), identifies the general location for a range of land uses on the Islands. More detailed planning will be required to determine the exact location and extent of these allocations.

Whilst the land use strategy recognises there are extensive areas that will be subject to development, it should be emphasised that all development on the Islands must be carried out in such a manner to reduce impact on the Islands' natural environment and landscape character. Retention of vegetation on lots, minimal earthworks for roads and dwellings and sensitive location of engineering services are among the strategies described in previous sections to minimise impact.

The Islands have been divided into a number of land use localities and precincts. The existing subdivision pattern makes no provisions for the establishment of discrete nodes or "communities" on the Islands with the lot layout being unresponsive to natural drainage areas and systems. However, retention and enhancement of the drainage corridors and conservation areas provides opportunity to "localise" the pattern of development on the Islands, that is, create localities which may lend themselves to different styles or scales of development.

These localities do not necessarily represent discrete areas of unique or homogenous characteristics (eg. lot size, landscape character etc.) but rather represent identifiable and walkable precincts which enable better management and arrangements of land use.

In most instances, it is not appropriate to consider each of these discrete areas as self-contained neighbourhoods in the traditional sense. Each Island is a neighbourhood and these localities are simply definable areas within this neighbourhood. The exception is Russell Island, where some of the localities would potentially be large enough and contain sufficient population to take on the functions and characteristics of a traditional neighbourhood.

In all cases, the edges of these localities are most important given the role they perform in breaking up the subdivision pattern and providing for the natural and biological processes on the Island.

Figures 11(a) and 11(b) show the proposed areas to be acquired for conservation protection, to accommodate stormwater drainage and to protect areas from inundation. These areas form the green corridors that will define

the edges of localities and precincts, the acquisition of which would enable more effective management as open space or conservation areas. It should be noted that the boundary to the conservation areas are indicative only and will need to be subject to further survey.

13.2 Russell Island

Russell Island is the largest of the group and has extensive areas of conservation priority lands. It also has the highest ultimate population and is the most remote from Brisbane. The preferred land use pattern for Russell Island allows for the protection of extensive conservation priority areas. Development density would be highest in the northern half of the Island where there are fewer environmental constraints and where services can be readily extended. Areas of medium, high and very high conservation areas, largely located at the southern end of the Island, would be precluded from development due to high ecological and cultural heritage values and higher servicing costs.

Russell Island can be divided into 7 localities. As mentioned above, some of these, because of their size and potential population, could take on the attributes of neighbourhoods which could contain some facilities to service local or neighbourhood residents. Within a number of these localities, discrete precincts can be identified which provide opportunity for different types and styles of development.

These localities and precincts are described below.

Locality 1 - Canaipa Point

Description

(i) General

Covering Canaipa Point, this area is one of the most densely settled on the Island and as such has some characteristics of a spacious mainland suburb. Presently around 30% of lots have been developed. However, it is also a picturesque part of the Island, particularly with the Stradbroke Island backdrop, and close proximity to the foreshores, which evokes a true sense of living on an Island. The western limit of this locality is the broad drainage line west of Aquarius Road.

The Royal Queensland Yacht Squadron's facility is located at Canaipa Point, arguably one of the most attractive and accessible sites for recreation boating facilities on the Island.

(ii) Environmental Attributes

This area has been extensively cleared and has no areas of conservation priority. However, the defining open space corridor west of this locality comprises marine and terrestrial associations of very high and high conservation values respectively. The foreshores and elevated promontories are important to the sense of enclosure in this part of Moreton Bay, and are of very high visual landscape significance.

The terrestrial vegetation in this corridor skirts the edge of one large unsubdivided lot. This corridor should be retained and widened as part of any future development of this site to protect this linkage.

Intent

There is a good variation of lot sizes in this locality and several large unsubdivided parcels zoned Rural/Non Urban which breakup the subdivision pattern. This contributes to the locality as being a "dress circle" residential location comprising around 350 developable lots. It would also lend itself to limited bed and breakfast or low key tourism accommodation facilities established on the large unsubdivided lots.

Opportunity for public recreational boating facilities adjacent to those of RQYS at Canaipa Point warrants further investigation.

Locality 2 - North Eastern Area

Description

(i) General

This includes the area east of High Street extending south generally to the well defined drainage corridor near Dragon Street and east to the Canaipa open space corridor.

(ii) Environmental Attributes

There are several pockets of vegetation throughout this locality assessed as having high and medium conservation priority. These are mainly on the few unsubdivided parcels of land and along the drainage corridors. The main attributes of the visual landscape are the vegetated drainage corridors and foreshore areas which articulate and frame the subdivision pattern.

This locality can be further subdivided into three distinct precincts.

Precinct A

Description

Precinct A abuts the Canaipa Point area, and comprises large unsubdivided parcels surrounding the enclaved subdivision (of around 80 allotments) in the Carina and Cycus Streets area. The RSL Club is also located in the precinct.

Intent

The majority of land in this precinct is zoned Rural/Non Urban. It is suitably located for the establishment of employment generating uses associated with tourism, recreational boating, age persons accommodation or other use identified by the community.

Precinct B

Description

This precinct comprises the majority of the remaining land in this locality apart from the commercial strip along High Street and the State School.

This precinct is bisected by the Borrows Street drainage and open space corridor which can be extended to link with high conservation value land owned by Council on the southern side of Fern Terrace. As with Canaipa Point, this precinct is quite extensively developed, particularly in the east where views over Canaipa Passage are possible. North of Fern Terrace around 25% of this precinct has been developed and this falls to 20% in the south.

Intent

Retention of the existing subdivision pattern is generally suggested for this precinct except where allotments need to be retained for drainage purposes and where they fall within the medium, high and very high conservation priority areas. Some 850 lots are potentially developable in this precinct.

Locality 3 - Island Gateway

(i) General

This locality includes the commercial strip along the eastern side of High Street, extending from the jetty carpark to Titala Street. This area is generally zoned Comprehensive Development. Current uses include a range of shops, the community hall and the State School. The precinct also includes the commercial area west of High Street currently zoned Tourism and Comprehensive Development, together with the large unsubdivided lot adjoining to the west. Non residential uses within this locality include a range of shops and professional offices, service station and the Bay Island Transport complex.

(ii) Environmental Attributes

The Borrows Street drainage line and associated vegetation bisects this locality. This is a prominent vegetation corridor and links with the foreshore vegetation associations. Being the gateway to the Island, this foreshore vegetation in particular has very high visual landscape significance.

Intent

This locality is walkable from the jetty. As such, land east of High Street is best suited to higher order commercial or community uses which could service not only the Island residents but residents from the other Islands. The range of uses in this precinct should complement rather than duplicate those envisaged in Locality 1 on Macleay Island. Development should reflect an Island 'village' theme and be "welcoming" to visitors and residents.

South of the State School the unsubdivided block between Fern Terrace and Titala Street should be retained for future extension of commercial uses. West of High Street this locality lends itself to the consolidation of commercial and community uses. The unsubdivided parcel should be retained for future community or commercial uses including tourist accommodation. Some 60-70

developable residential lots are also located in this precinct along with some 3.2 hectares of land suitable for commercial development.

Locality 4 - North Western Area

Description

(i) General

This includes the area west of Locality 3 and extending southward to Black Cat Swamp and adjacent Council owned land.

(ii) Environmental Attributes

This area has several pockets of remnant vegetation with medium conservation priority, mainly adjacent drainage lines and on some unsubdivided lots. The southern part of this area has quite extensive tree cover and has been identified as having low conservation priority. Once again the vegetation corridors along the northern and western foreshores have very high visual landscape significance.

This locality can be further divided into 2 precincts.

Precinct C

Description

This precinct comprises the residential lands west of Locality 3 and extends southwards to a well defined open space and drainage corridor following the general alignment of Cynthia Crescent and Bamboo Road. It contains a mix of lot sizes, generally under 700 m^2 in area. Presently around 25% of the precinct has been developed.

Intent

The intent for this area is as a residential neighbourhood being serviced by commercial and community facilities in Precinct C. Overall some 650-700 lots are developable in this precinct.

The precinct also includes several large Rural/Non Urban parcels which may be suitable to accommodate any future recreation or tourist accommodation in the area.

Precinct D

Description

This 100 hectare precinct lies to the south of Precinct D, extending from the Cynthia Crescent/Bamboo Road open space corridor to Black Cat Swamp. The area is predominated by 500 to 600 m^2 lots, the total yield is approximately 1000 lots. Only around 15% of land in this precinct has been developed.

Council owns three relatively large open space/recreational sites in this precinct, all accessed from Jackson Road. These are the Jackson Cricket Grounds (also used as the emergency helicopter landing site), the Bowls Club site and a park at the intersection with High Street.

Intent

This precinct would develop as a discrete Island neighbourhood. The Bowls Club site provides opportunity for the establishment of a community focal point for Precinct D, with the long term establishment of convenience shops and services. This will be required to serve an eventual population of around 2000 residents in this precinct, many of whom would not be within walking distance to shops and services in Precinct C.

A concrete batching plant is also located in this precinct on the edge of Black Cat Swamp. While its location is relatively remote from surrounding residents and screened from vantage points on Moreton Bay, it adjoins an area of very high conservation priority including freshwater wetlands. Land in this precinct is not considered an appropriate location for the expansion of such uses. Consideration should be made to providing an area along Davidson Road adjacent to the proposed Council depot and waste transfer station for uses of an industrial nature.

Locality 5 - Central Area

Description

(i) General

This area comprises three discrete precincts, one extending from Sloop Street in the north to the Department of Education land in the south on the eastern side of the Island (Precinct E), the second around Waratah and Magnolia Streets on the western side (Precinct F). Lot size within these precincts is marginally larger than on most of the Island, being between 600-700 m^2 in area. Both these precincts are sparsely developed, with around 10% of lots developed in Precinct E and about half this in Precinct F.

The third precinct, Precinct G comprises part of the Council owned land south of Davidson Street. This cleared area is currently being developed as a waste transfer site and Council depot.

(ii) Environmental Attributes

All precincts are clearly defined by surrounding high or very high conservation priority vegetation. A large area of wetland associated vegetation in Precinct E has a medium conservation priority, and lies in the upper catchment of Black Cat Swamp. Precinct F is relatively elevated with the highest areas visually prominent from the Bay.

Some 50% of Precinct F has a low conservation priority.

Precinct G has been cleared of high conservation priority vegetation.

Intent

Precinct E

Precinct E should remain as a discrete residential precinct of some 300-350 lots in an area of around 30 hectares.

The ultimate population of this precinct would not justify the establishment of any support facilities. However, opportunity may exist to provide access to the foreshore from the end of Minjerriba Drive or nearby Skiff Street. A site should be identified for detailed assessment of its suitability for the future establishment of passenger transport facilities in this location. Some tourist/recreation type facility which could also cater for some resident needs and may be appropriately located at the chosen foreshore access point.

Precinct F

Precinct F, immediately west of the Department of Education land referred to above and Council owned land fronting Davidson Road, comprises an area of around 30 hectares, and contains some 300-350 developable lots.

This should also remain a discrete residential precinct with opportunity for some appropriate Island serving community or recreation facility on the unsubdivided lot in its north eastern corner (fronting Central Road).

Retention of vegetation on the Council owned land around the proposed depot site and waste transfer site in Precinct G will be paramount to the maintenance of residential amenity in this Precinct.

Precinct G

This precinct would be suitable for difficult to locate industrial type uses in a landscaped setting. It is also the preferred location of a future wastewater treatment plant to service the Island group. Only minimal vegetation removal should occur and a vegetated buffer should be retained around uses in this precinct.

Locality 6 - Southern Central Area

Description

(i) General

This is a relatively large area (124 hectares) between two well defined drainage corridors midway along Russell Island. The average lot size ranges between 500 and 600 m^2 and there are no large lots or sites for non-residential uses within this locality. Around 1 lot in every 10 to 12 has been developed.

(ii) Environmental Attributes

The northern and southern drainage corridors defining this locality have a very high conservation priority rating. However most of this area is covered by regrowth vegetation of low conservation priority, although the visual landscape quality is very high on the elevated areas in the east of this locality.

Intent

Due to the size of this area and relatively high potential population, some restructuring of the subdivision will be required to provide a site for a future local centre, possibly at the intersection of Centre Road and Karrajong Road. Also, an opportunity may exist to restructure some allotments along Wahine

Drive to respond to access and lowlying land constraints. This locality comprises some 1200 lots and could ultimately contain a population of 2400 residents.

Opportunity may exist to provide access to the foreshore from Council owned land at the end of Scenic Drive or elsewhere around the eastern end of Barcelona Terrace.

Ultimately, the development of a water oriented community and tourist service centre in this location may be feasible as another alternative 'gateway' to the Island. Further investigations are required to identify appropriate sites and prepare management plans to cater for this opportunity.

Locality 7 - South-Eastern Foreshore

Description

(i) General

This area comprises a narrow band along the south-eastern foreshore and extends from Seaward Drive in the north to the south-eastern tip of the Island. It can be further divided into two precincts.

Precinct H comprises some 27 hectares and covers the narrow band of allotments down the south-eastern foreshore. Some 200 lots are potentially developable in this precinct. At present only around 1 in 10 of these have been developed.

Precinct I is the isolated pocket of allotments south of Glendale Road and generally accessed off Crescent Drive. It is a relatively picturesque pocket covering an area of 41 hectares and offers elevated views across to Stradbroke Island and the southern end of Moreton Bay. It is also relatively developed, particularly along the foreshore. Overall the proportion of developed lots is approaching 10%.

(ii) Environmental Attributes

Precinct H has been extensively cleared and the only areas of vegetation with any (low) conservation priority being along the steep eastern escarpment. Much of this precinct is relatively elevated and visually prominent from Canaipa Passage and southern parts of the Bay.

Much of Precinct I has been cleared and retains only some areas of low conservation priority vegetation. It too is relatively prominent and has high landscape value.

Intent

Precinct H

Development in this residential precinct will be visually prominent from Canaipa Passage and warrants special consideration in relation to foreshore vegetation retention. Many of the allotments include steep heavily vegetated escarpment areas which would necessitate special design and siting measures.

Allotments fronting Bauhinia and Paringa Drives may need to be restructured to provide suitable access.

Access to the foreshore off the end of Shore Street is available in this precinct and this area could be ultimately developed as a bay oriented community centre similar to that in Locality 6.

Precinct I

The intent for this precinct is the same as for Precinct H.

Access to the foreshore is available from the Boulevarde and a foreshore park has been established. Some allotments fronting Headland Court may need to be restructured to provide suitable access. Many lots in this precinct are lowlying and have been designated Drainage Problem, leaving around 250-300 potentially developable lots.

The northern limit to this precinct is a large unsubdivided parcel at one stage identified for the establishment of a tourism facility. This parcel is of high conservation value and should be precluded from development.

Locality 8 - Southern

Description

(i) General

This area comprises the remaining lands south of Black Cat Swamp at the southern end of Russell Island.

Development density is sparse, currently less than 1 lot in 50 being built upon.

(ii) Environmental Attributes

Almost all of this area is either of medium, high or very high conservation priority. This relatively intact area of Russell Island is also regarded as having very high cultural heritage significance encompassing story places, resource areas and possible coastal sites.

Intent

Consistent with the aim of achieving sustainable levels of development and the vision of an Island lifestyle, it is intended that this area be precluded from development for the reasons outlined in Section 5.2.Existing dwellings will be serviced by a low impact road network. Rationalisation of the electricity distribution network would be required in this locality.

13.3 Macleay Island

Overview

Macleay Island is likely to remain the most popular Island for residents needing to commute frequently to the mainland.

Being the most developed of the Islands, it has fewer areas of conservation priority. However, the Island retains relatively extensive, and from a visual landscape perspective significant, vegetation cover. Management of the landscape is an important component of the preferred land use and development strategy for Macleay Island.

A description of the localities and envisaged land uses on Macleay Island follows.

Locality 1 - Gateway

Description

(i) General

This is essentially the area extending from the jetty, Progress Hall and Tavern area to the east-west drainage reserve at Frenchem Terrace. The southern portion of this locality, covering an area of around 19.5 hectares is currently zoned Comprehensive Development. North of Scarborough Road, the area is predominantly zoned Residential. This area is subdivided into approximately 220 allotments ranging in area from 450 to 1,000 m^2.

The extent of development in this locality overall approximates around 25%.

(ii) Environmental Values

West of the jetty carpark, Progress Hall and Tavern, this locality is heavily vegetated, although in biological terms this vegetation has low conservation priority. In landscape terms, this area is visually significant as it contributes to the perception of a natural backdrop to the picturesque passage between Macleay and Karragarra Islands. An area of very high conservation priority on steep elevated land at the eastern end of Scarborough Terrace is also a prominent feature of this locality.

Intent

This locality can be divided into two land use precincts.

Precinct A

Precinct A comprises the area around the jetty, Progress Hall, Tavern and vacant land to the west extending north to Scarborough Terrace.

It is intended that this precinct be the hub for the development of higher order commercial uses and community and recreation facilities serving the Island group. (A second hub is envisaged on Russell Island). It would also be appropriate for the development of tourism related facilities which target the short stay visitor or recreational boating market. Any such development would need to be subservient to the precinct's natural backdrop and complementary to the overall image of life on the Islands.

Precinct B

Precinct B comprises the remainder of this locality. It is intended that this precinct remain predominantly island-residential. That is, residential development of a scale, character and streetscape that is distinctive of the Bay

Islands. Some non-residential land uses (such as visitor accommodation) may also be appropriate within this Precinct. Such uses should not necessarily be focussed along High Central Road, but rather appropriately sited in less prominent locations and where conflict with residents would be minimal.

Drainage Open Space Corridors

The predominant drainage corridor forming the northern limit to this locality starts at the ridge near the corner of Hastings Terrace and Brighton Road, heads north-west to Frenchem Terrace and runs parallel to this Terrace as far as the wetlands on the western side of the Island.

This corridor lacks any defining vegetation of conservation priority, and almost all land along the corridor is privately owned and zoned Residential.

To accommodate stormwater flows, 13 lots have been identified for acquisition. A further 13 lots have been identified as partly affected by stormwater flows. The four partly affected lots east of High Central Road together with two other lots should be acquired to reinforce this corridor and provide opportunities for re-establishing a vegetation link. The link west of High Central Road can be widened by incorporating a buffer strip as part of the future development of a single large unsubdivided land parcel. Opportunity also exists to extent this link eastward to join with the drainage corridor along Eastbourne Terrace.

Locality 2 - Western Road Area

Description

(i) General

This is an enclave of residential land surrounded by wetlands and coastal vegetation. It is extensively developed (particularly the foreshore lots) and no future provision is made, or is warranted, for any non-residential uses. It covers an area of around 14 hectares and contains some 130 lots ranging in size of between 500 m^2 and 1,000 m^2.

(ii) Environmental Values

This area generally lacks significant vegetation, but is surrounded by marine and freshwater wetland ecosystems of very high conservation priority.

Intent

This precinct should be exclusively island-residential.

Locality 3 - Golf Course Area

Description

(i) General

This area lies to the north of Locality 1 and comprises a mixture of residential lot sizes generally under 1000 m^2. The extent of development is around 25% to

30% of lots. Two unsubdivided parcels of land are located in this locality, currently zoned Rural/Non Urban. The golf course lies in its north eastern corner. Exclusive of the golf course, the area covers around 80 hectares and contains some 650-700 lots.

The drainage corridor adjoining the shopping centre defines the northern boundary of this area and provides an attractive open space opportunity.

(ii) Environmental Values

This locality has no vegetated areas of very high or high conservation value although there are known pockets of vegetation in this locality which is attractive to the Black Glossy Cockatoo. A small pocket of unsubdivided land adjacent to the golf course has a medium conservation priority. However, the defining open space corridor links with very high priority conservation wetland areas and associated vegetation.

Intent

This area should develop as an island-residential precinct.

The shopping centre will remain an important focal point for residents in this locality, however further expansion of commercial uses in this location is not preferred. A more centralised commercial hub in the locality to the north (Locality 5) is intended. The existing shopping centre lies midway between the proposed one to the north and the proposed major commercial hub in Precinct A.

The two larger unsubdivided parcels should be retained for long term possible development of visitor or aged persons accommodation, or some other use identified by the community.

Drainage/Open Space Corridors

The northern drainage corridor adjacent to the shopping centre is well defined and vegetated. Council own the majority of lots along this corridor although a further four lots need to be acquired to accommodate stormwater flows. A further nine lots are partly affected by overland flows. These lots are not required for corridor widening.

Locality 4 - School Area

Description

(i) General

This locality extends north to the large wetland area adjacent to Lemontree Drive, West of High Central Road, and to the drainage corridor associated with this wetland in the Pecan Street vicinity east of the High Central Road.

Similar in residential lot mix to Locality 1, this precinct also includes the Macleay Island State School and former hardware store complex. These uses, on either side of High Central Road, give this locality a distinctive non-residential land use character. The area covers around 81 hectares and contains some 750-800 lots. Around 25% of lots have been developed.

(ii) Environmental Values

Unlike much of Locality 3, this area has quite widespread vegetation cover and a small pocket of medium conservation priority rated vegetation covering eight lots two of which have dwellings on them.

Intent

This precinct should remain predominantly island-residential in nature with a small area for community related uses opposite the school (around the hardware complex site). The nature of land use opposite the school will have a bearing on both the amenity of the school and perceptions of the overall character of this locality. Further service trade uses would not be inappropriate in this location, as would any use which could generate higher traffic volumes.

No further commercial land or special facility sites are considered appropriate in this locality.

Drainage/Open Space Corridors

The drainage corridor delineating the northern limit of this locality links to one of the large wetland ecosystems on the western side of the Island. Much of this wetland is currently owned by Council and is zoned Drainage Problem. The corridor east of High Central Road is also reasonably well defined by remnant vegetation. However, all but a narrow band of land is zoned Residential. Ten lots with drainage constraints have been identified for acquisition east of High Central Road which would extend the open space corridor east to Citron Street. Acquisition of an additional three lots in Citron Street, four in Walnut Court and two in Pecan Street would complete an east-west corridor. This would also obviate the need to construct Walnut Court. The foreshore area at Sunrise Esplanade at the end of this link could be developed as a public facility.

Locality 5 - Central Area

Description

(i) General

This 85 hectare area extends northward from Locality 4 to the open space system adjacent to Wanda Street, west of High Central Road, and to the large undeveloped lot (currently zoned Tourism) south of Wirralee Street, east of High Central Road.

(ii) Environmental Values

This locality includes some of the most heavily timbered land on the Island and includes quite extensive areas of medium conservation priority vegetation. The majority of this is on the large unsubdivided lots east of High Central Road which are a feature of this locality. This relatively intact area has high cultural heritage significance representing a cross-section from high ground to the sea and encompassing various story places, resource areas and possible coastal sites. Land west of High Central Road has been designated as having a low conservation priority although foreshore vegetation has a very high visual landscape value. However, the vegetation does have significant value in terms of residential and landscape amenity.

Intent

This locality is relatively central to the Island and thereby lends itself to catering for a wider range of land uses serving the needs of the entire Island population. It can be further subdivided into three precincts.

Precinct C

Lying to the east of High Central Road, this precinct comprises mostly relatively larger sized lots. Two of these large parcels are owned by Council and are currently zoned Comprehensive Development. The northern most parcel, on Nunkeri Drive, lies adjacent to an existing small shopping centre. This location is well located as a future commercial and community node for the Island, playing a complementary role to uses in Precinct A.

The southern Council owned parcel is located in a medium conservation priority area, and is used as a Council stockpile area. This parcel lends itself to service trade uses which may require screening from the public. No development is envisaged in those areas designated medium conservation priority.

Precinct D

This 73 hectare precinct includes land to the west of High Central Road and east of it between Sentose Terrace to the north and Mango Crescent in the south. This is currently subdivided into some 500 lots ranging in area from 500 to over 1,000 m^2. The extent of development varies throughout this precinct. Nearly all foreshore lots have been developed but elsewhere in the precinct, the proportion of lots falls to around 15%. There are some 480 developable lots in this precinct.

This is a residential precinct in which lot amalgamations should be encouraged in order to reduce vegetation loss.

Thompsons Point wharf site is also located in this Precinct, at the end of Wharf Street. This is one of two areas being considered for the development of a passenger jetty and associated facilities at the northern end of Macleay Island.

This is also a historical precinct being the site of a Kanak Wharf.

If selected as the preferred wharf site, development in this precinct should be in accordance with a site development plan that reflects its environmental and historical attributes. Due to surrounding uses, limited space and access constraints, the site is not considered appropriate for the establishment of a public boat ramp for water based recreation facilities.

Precinct E

Precinct E comprises the majority of lots on the southern side of the large unsubdivided parcel of land immediately to the south. This latter area is currently zoned for tourism development.

It is questionable whether this site, with its frontage to Perulpa Bay, is appropriate for the integrated tourist complex initially envisaged here. The Bay is silting up and does not provide suitable water access. Furthermore, the waters of Perulpa Bay are poorly flushed and susceptible to water quality problems and about 50% of this site comprises medium conservation priority vegetation.

The areas, of low conservation priority would lend itself to the development of sporting and recreation facilities for the Island together with possible aged persons, overnight visitors' accommodation or for future employment areas etc.

Both this precinct, and the commercial centre site to its south in Precinct D offer convenient proximity to the possible public jetty site at Thompsons Point (Precinct E).

Drainage/Open Space Corridors

The northern open space corridor comprises the Drainage Problem land between Wanda Street and Undine Street west of High Central Road, and areas of medium conservation priority vegetation on the eastern side of the road.

Locality 6 - Northern Western

Description

(i) General

This locality is situated on the western side of High Central Road, from the Wanda Street open space corridor to the drainage corridor south of Balaka Street. Block sizes range from 600 m^2 to over 1,000 m^2 and there are some 150 Residential zoned lots. Only about 15% of lots have been developed. This locality also includes the Bowls Club and Art and Craft Centre.

(ii) Environmental Attributes

About half of the lots in this locality are either zoned Drainage Problem or lie within the medium conservation priority designation. This locality has high visual landscape significance, being visible in a direct line of sight from Victoria Point and adjacent areas on the mainland.

Intent

Development in this locality should be limited in order to protect the remaining vegetation. The strategy envisages no development in areas identified as having medium conservation priority in order to retain a landscaped setting. There are around 60 developable lots in this precinct.

Drainage/Open Space Corridor

The northern limit of this locality is delineated by an extensive drainage corridor around Balaka Street. Whilst several lots will need to be acquired for drainage purposes, no additional acquisitions to extend or widen this corridor will be required as land to the south of Balaka Street has high conservation priority and is precluded from development in the proposed strategy.

Locality 7 - Northern Area

Description

(i) General

This area includes all that part of the Island north of the Bowling Club and comprises an area of around 100 hectares. It also includes a mix of residential lot sizes together with some of the most established recreational facilities/areas on the Island. These include Patts Park and the popular beach area and boat mooring off Dalpura Street.

Around 15% - 20% have been developed, although this is higher along the foreshore. Some 800 residential blocks are potentially available in this locality.

(ii) Environmental Attributes

Much of this area is lightly timbered with significant areas east of High Central Road in the low conservation priority area. A large wetland in the Kardina Street area on the eastern side has a very high conservation priority. Prominent ridgelines, headlands and all foreshore areas have high to

very high visual landscape significance, being visible from extensive areas of the Bay and mainland.

Intent

This area has relatively high visual significance and features some prominent foreshore landscapes. Block amalgamations should be encouraged to retain vegetation cover and building envelopes should be considered where block sizes permit. Some 800 lots are potentially developable in this area.

A detailed site management plan should be prepared for the Dalpura Street foreshore access reserve and a possible second reserve on Crown land at the end of Cross Street. The range of facilities at each site should be addressed as part of the Impact Assessment Study for the northern passenger jetty facility.

Locality 8 - Perulpa Area

Description

(i) General

This area comprises the Corroboree Point peninsula and Perulpa Island, comprising a total area of around 21 hectares. The area is subdivided into some 190 lots ranging in area from 500 m^2 to 1,000 m^2. Development density is around 25% - 30% of lots in this area have been developed.

(ii) Environmental Attributes

The locality is fringed by low conservation priority vegetation. This vegetation contributes to the high to very high visual landscape value of this area particularly on the headlands and the foreshores.

Corroboree Point is also a known location of sites with high Aboriginal conservation significance.

Intent

Both Corroboree Point and Perulpa Island will remain quite distinctive residential precincts, offering a "retreat" from the more populated parts of Macleay Island. Some lot amalgamation or restructuring will be required to improve access to lots fronting Boat Harbour Avenue.

13.4 Lamb Island

Overview

Lamb Island is essentially one neighbourhood divided into four distinct localities. The strategy for this Island is to reinforce these individual localities and give greater definition to the development pattern through the retention of open space corridors and the protection of those areas of conservation value.

The four localities are described below.

Locality 1 - Southern Area

Description

(i) General

This 29 hectare area extends from the jetty to the drainage corridor adjacent to Nectar Street north of Lucas Drive, and north to Helen Parade south of Lucas Drive. The area is subdivided into some 355 lots ranging in size from 500 m^2 to over 1,000 m^2. Around 30% of lots have been developed. This area also includes the Comprehensive Development zoned land near the ferry facilities. This land contains a kiosk, carpark, ablutions block, Council Depot and fire tender shed.

A parcel of land at the corner of Lucas Drive and Cresthaven Street is identified for Special Purposes.

(ii) Environmental Attributes

This locality has been extensively cleared and there is no vegetation rated as having conservation significance. However, the remnant vegetation, particularly around the eastern foreshore and adjoining the drainage lines, is of high visual landscape value.

Intent

This precinct is the gateway to Lamb Island uses, and influences the general perceptions of the Island. Consideration should be given to relocating the utility facilities near the jetty to Council land to the north of the Island and redevelop this area as a fitting entry. Apart from residential uses, community or commercial uses which would benefit from being in easy walking distance from the jetty would be appropriate in this locality.

Drainage/Open Space Corridor

North of Lucas Drive, the northern limit of this locality is defined by the prominent drainage corridor along Nectar Street. This land is largely owned by Council and no further acquisitions are required to establish this corridor.

South of Lucas Drive, the northern limit of Locality 1 is defined by the large undeveloped and extensively timbered parcel adjacent to Helen Parade.

Locality 2 - Western Area

Description

(i) General

This 28 hectare area includes the land north of the Nectar Street drainage corridor and extending to the Council refuse site west of Lucas Drive. Some 320 developable lots ranging in area from 500 m^2 to over 1,000 m^2 are available in this locality, some 20% of which have been developed. A large parcel of unsubdivided land in the south-western corner of this locality is currently zoned Rural/Non Urban.

(ii) Environmental Attributes

This area is also relatively cleared with only a few small pockets of vegetation assessed to have low conservation priority. The Council owned land forming the northern limit to this precinct contains coastal wetland communities and has a very high conservation priority. Due to its prominence it also has very high visual landscape significance.

Intent

This area should be retained as a residential precinct with lot amalgamations encouraged to increase tree retention potential. The large unsubdivided parcel should be retained for compatible non-residential uses, perhaps associated with ecotourism, aged persons accommodation or environmental education.

Locality 3 - Northern

Description

(i) General

This 15 hectare area lies to the north of the oval and refuse site around Clarkes Point. It comprises around 150 developable lots, about 25% of which have been developed. This area also has an unsubdivided parcel of land which could be retained for suitable non residential land uses.

(ii) Environmental Attributes

This area has been largely cleared although two pockets of wetland vegetation having very high conservation priority remain, along with significant foreshore vegetation assessed as having low conservation priority. The northern foreshore areas are visually prominent and assessed as having high to very high visual landscape significance.

Intent

This area should be retained for residential uses. As with Locality 2, lot amalgamation should be encouraged to retain the character of this locality.

Locality 4 - Eastern

Description

(i) General

This locality lies to the south of Lucas Drive and includes the ovals, bowls and recreation club, the Pioneer Hall together with the mostly cleared portion of the large parcel of unsubdivided land immediately south of the hall.

(ii) Environmental Attributes

The large privately owned parcel in the southern part of this locality has extensive areas of vegetation assessed to be of medium conservation priority. This vegetation, together with the vegetation along the eastern foreshore, have very high visual landscape significance. Much of this area is considered to be of high cultural heritage significance, encompassing various Aboriginal story places, resource areas and possible coastal sites. The northern area is cleared and used as playing fields and recreation facilities.

Intent

The northern portion could become the recreational and entertainment hub for Island residents and also provide opportunity for the establishment of appropriate non-residential uses which could provide employment opportunities.

The vegetation on the southern portion should be retained as it represents the largest area of terrestrial remnant vegetation on the Island, it is readily manageable being in one ownership, and it forms an important element of the visual landscape on Lamb Island.

13.5 Karragarra Island

The strategy for Karragarra Island envisages a small scale residential community reliant on Macleay Island and the mainland for facilities and services.

Karragarra Island has not been divided into localities due to its size, configuration and absence of distinct drainage corridors. The Island is extensively subdivided apart from several large parcels of Rural/Non Urban land at the extreme western end, together with similar sized parcels zoned Residential A and Open Space at the extreme eastern end.

Both ends of the Island contain Aboriginal middens and have high cultural heritage significance.

An esplanade runs the length of the northern foreshore, and to this extent the subdivision pattern actually "celebrates" the foreshore.

Several lots in the centre of the Island are zoned Comprehensive Development and are owned by Council. It is not envisaged that this Island will need (or desire) any commercial facilities. The best use of this land is either as parkland

(amalgamate with drainage affected land to the east) or retained for some future community use (eg. community common).

The southern most lots, serviced by Treasure Island Avenue, comprise the most vulnerable areas of conservation priority vegetation. Those lots on which a 450 m^2 building site cannot be achieved above the RL 2.4 m development line, or which have a high or very high conservation priority rating, should be precluded from development. On other sites, building envelopes should be identified to reduce tree removal.

Some 220 lots would be developable on this Island.

The intertidal areas to the south east and west of Karragarra Island comprises extensive mangrove communities which provide a natural backdrop to the adjoining waterways. All these areas are below the RL 2.4 m development line and would not be subject to development.

13.6 Land Use Summary

The following table provides a summary of the major land use allocations and ultimate population for each Island.

Table 13.1
Land Use Summary

	Residential Lots[1]	Population[2]	Commercial/ Mixed Use[3] (ha)	Special Use Areas[3] (ha)	Industry[3] (ha)	Conservation/ Open Space[3] (ha)
Russell	6,527	13,054	27	33	35	461
Macleay	3,756	7,512	12	23	-	126
Lamb	775	1,550	2	8	-	19
Karragarra	290	580	-	-	-	7
Total	**11,348**	**22,696**	**41**	**64**	**35**	**613**

1. Based on GIS generated lot counts. Includes lots in DP zone with existing building approvals and dwellings together with DP lots identified for recategorisation.
2. Estimate based on 2 persons per dwelling.
3. Areas are approximate only.

14. Development Costs and Funding Alternatives

14.1 Development Costs

14.1.1 Engineering Services

Table 14.1 shows the estimated costs of major engineering capital works associated with the development of the Islands, including road upgrading, the eventual introduction of sewerage, and stormwater management. The cost of providing water and electricity has not been included as part of these estimates as funding for these services has previously been established.

While the preferred strategy adopts measures to reduce the overall level of development on the Islands, as the table suggests the costs of engineering services will still be significant, around $99.5M for roadworks and sewerage alone.

The costs of road upgrading have been reduced through the adoption of design standards more appropriate for the Islands, as discussed in Section 10.

Given the size of the allotments, sewerage will ultimately be required to service the subdivision pattern, although its introduction is not envisaged in the immediate future.

Stormwater management will be crucial to the environmental sustainability of future development on the Islands and will involve the adoption of a range of measures such as retarding basins, use of vegetated drainage corridors and artificial wetlands. Notional costs of stormwater treatment structures together with the cost of acquiring land to accommodate these, and for the conveyance of stormwater, have been included in the costings. Minor works include the provision of gross pollutant traps and stormwater retarding basins/wetlands to remove rubbish, sediments and nutrients from stormwater. Major facilities allow for more substantial and elaborate structures to manage flows from larger catchments. The nature and cost of such measures will actually depend on catchment size and number of sub-catchments together with soil and site conditions, and would need to be more accurately determined through detailed design.

14.1.2 Human Services

In addition, the cost of providing human services to the Islands would also need to be considered. While the preferred strategy delivers an ultimate population some 30%-50% less than would otherwise occur without intervention, there will still be a need to provide community facilities and services for a population of around 22,700 residents. This is discussed in detail in Section 11.

Major cost items are likely to include a second primary school on Russell Island ($6.0M), police and emergency service facilities together with community health services, on either Russell or Macleay Islands.

A secondary school or Russell Island would be difficult to justify in terms of the reduced Islands population, likely demographic profile and allowing for leakage from the catchment due to students attending private secondary schools on the mainland. The Department of Education has already indicated it has difficulty in servicing the Islands in view of the competing demands from high growth areas on the mainland, and up to a point, would subsidise transport to the nearest schools in preference to establishing new facilities. At present, transport subsidies of the order of $176,000/year are being paid for secondary students living on the Islands. This could increase to around $1.5M/year once the ultimate population is reached. These costs would need to be weighed against the capital costs of $12M for a school on Russell Island and operating costs of around $1.8M/year for a secondary school with 300-400 students.

14.1.3 Acquisitions

Table 14.2 shows the potential costs of acquiring Residential A zoned lots precluded from development under this strategy due to drainage constraints, for environmental conservation and/or on the basis of reducing overall infrastructure requirements and ongoing servicing costs. It is not intended to acquire any lots with existing approved buildings or with a current Building Approval.

The cost of acquiring existing DP lots is also shown in the Table.

While it is questionable whether compensation for lost development rights would be claimable under the new *Integrated Planning Act* for these lots, it is nonetheless recommended that consideration be given to their acquisition for all the following reasons:

- the cost of precluding development through land acquisition is likely to be generally less expensive than the capital costs of providing engineering services, providing the value of the lots does not exceed $8,500 - $10,000;
- other savings to service agencies would also accrue through reduced infrastructure maintenance and operational costs (although these are largely funded through rate revenue);
- having these areas under public ownership will facilitate their protection and ongoing management; and
- there are the equity issues to be addressed, with landowners paying rates in good faith over many years in the expectation of being able to build or recoup some capital gain through the sale of their lot.

14.1.4 Acquisition Priorities

Based on the assumed land values discussed in Section 7.3, the total cost of acquisitions would be around $20.4M. Clearly such outlays would need to be staged over a number of years. The priorities for acquisition should reflect the following:

- the importance to the overall strategy and to the achievement of sustainable development of having the lots in public ownership and under public management;
- the pre-existing zoning and level of threat to environmental values on lots.

The various categories of land for acquisition are:

- Lots that are strategically significant for the implementation of the strategy, eg. those in the southern parts of Russell Island.
- Residential A lots in very high conservation priority areas.
- Residential A lots in high conservation priority areas.
- Lots in drainage categories 1, 5 and 8.
- Lots in drainage category 4 ie. existing DP lots.
- Lots in drainage category 6 which are assessed as unsuitable for development.

An Acquisition Strategy will need to be prepared to consider which combination of lots in the above categories should be given priority.

14.2 Savings

While the preferred strategy will have an overall implementation cost (if acquisition of all non-developable lots is included) of around $136.4M , this needs to be compared to the cost of servicing development on the Islands that could potentially occur under the existing planning controls. Such a comparison highlights several areas where substantial savings in infrastructure capital costs will result from the preferred strategy. These savings are listed below:

- savings of at least $12M on road and sewerage infrastructure;
- savings of around $12M through not having to provide a secondary school;
- savings in secondary school operating costs, which should negate the cost of the transport subsidy to secondary school students;
- savings in water reticulation costs, largely on Russell Island (estimated at around $9M);
- savings of around $6M through the possible avoidance of the need for a second state school on Russell Island;

- savings from reduced community facilities required to service a lower population; and
- savings in stormwater treatment costs due to lower runoff volumes and retention of natural buffers.

14.3 Funding

The figures clearly indicate that substantial levels of capital investment will need to be spent on the Islands to provide the essential infrastructure to service the ultimate development. Normally such infrastructure is provided at the time of lot reconfiguration and the costs included in the purchase price of the land. This was not the case with the Bay Islands.

If the areas identified for acquisition are deleted from development as proposed, the costs of providing infrastructure to the Islands (excluding sewerage) would be as follows:

Roads		$36.1M
Marine Infrastructure		$2.7M
Stormwater Structures		$5.2M
Drainage Land		$1.0M
Open Space		$0.1M
	Total	*$45.1M*

The possible cost of compensation/acquisition of conservation areas and DP lots is as follows:

Lots in high and very high Conservation Areas		$4.9M
Lots in strategic locations		$13.2M
Flood Affected and Existing DP Lots		$2.3M
	Total	*$20.4M*

Such funding requirements are beyond the reach of Local Government.

The Southern Moreton Bay Islands are an integral part of the Moreton Bay ecological system and a major contributor to the largely unspoilt natural backdrop to the Bay. Furthermore, the Islands themselves are rich in environmental, historical, cultural and recreational attributes, and offer both a unique lifestyle for residents and an Island "getaway" experience for visitors.

The Islands are therefore of local, regional and national significance, and the responsibility for their protection therefore rests with the broad community.

Funding for this strategy, which finally represents a solution to the threat to the Islands' (and Moreton Bay's) environmental values resulting from inappropriate subdivision patterns allowed in the past, therefore requires a unique and integrated approach from all spheres of Government. Consideration should be given to a funding strategy that is therefore unconstrained by the usual division of responsibilities between the three spheres of Government.

Table 14.1
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 14.2
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.