



Great Keppel Island
REVITALISATION PLAN

2. DESCRIPTION OF THE PROJECT







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2. DESCRIPTION OF THE PROJECT

2.1 Location and Tenure

GKI with an area of approximately 1,308 hectares is located within the Rockhampton Regional Council local government area, approximately 12 kilometres off the coast of Yeppoon in Central Queensland. The Island forms part of the Keppel group of sixteen islands and is the largest island in the group, which also includes North Keppel Island, Corroboree Island, Pumpkin Island, Miall Island, Middle Island, Barren Island, Halfway Island and Humpy Island (refer **Figure 2.1**). Apart from GKI and Pumpkin Island, all of the other Keppel group islands are designated National Parks which exclude development for tourism purposes.

The Island (refer **Figure 2.1** and **Figure 2.2**) is located at the southern end of the GBRWHA and is approximately 200 kilometres south-west of the closest outer reefs, the Swain Reefs (refer **Figure 2.3**).

The GKI Revitalisation Plan is largely proposed to occur on land areas that are currently leased by the Proponent, GKI Resort Pty Ltd, from the Queensland Government. The real property description, land area and land tenure of the existing leased lots are outlined in **Table 2.1** and shown in the land tenure map (**Figure 2.4**).



Figure 2.1 LOCATION MAP

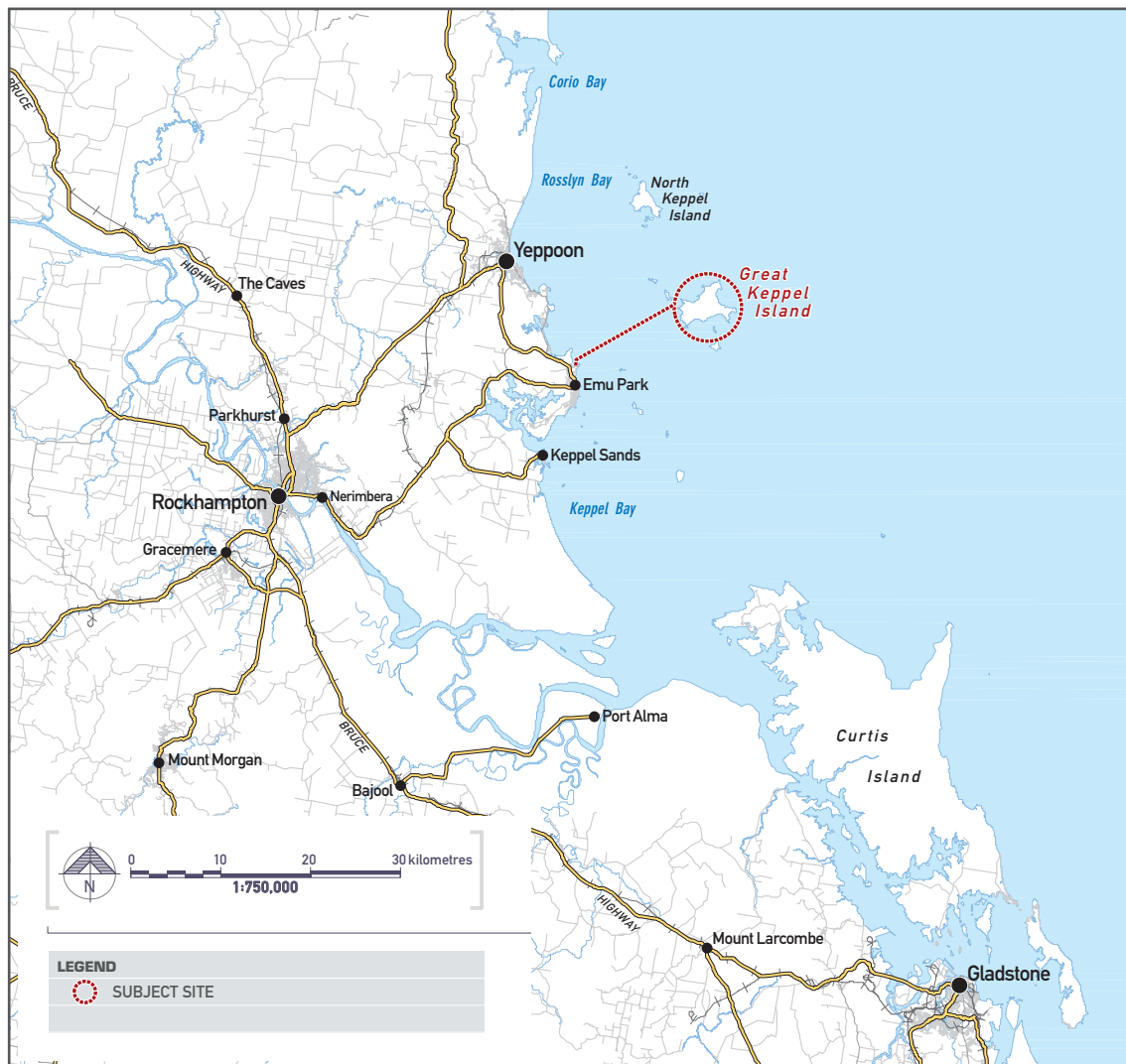


TABLE 2.1 GKI LAND TENURE PROPONENT LEASED AREAS

| Lot Number | Plan Number | Lot Area (ha) | Land Ownership Tenure | Lease Purpose |
|-------------------|-------------|---------------|----------------------------------|---------------|
| Lot 21 | SP192569 | 875 | GKI Resort Pty Ltd (Lands Lease) | Recreation |
| Lot 1 | AP2516 | 0.013 | GKI Resort Pty Ltd (Lands Lease) | Tourism |
| Lot 43 | CP843165 | 0.0003 | GKI Resort Pty Ltd (Lands Lease) | Tourism |
| Lot 2 | LN2615 | 7.986 | GKI Resort Pty Ltd (Lands Lease) | Tourism |
| Lot 31 | LN2704 | 17.75 | GKI Resort Pty Ltd (Lands Lease) | Tourism |
| Lot 45 | LN2763 | 3 | GKI Resort Pty Ltd (Lands Lease) | Tourism |
| Lot 46 | LN2763 | 0.2852 | GKI Resort Pty Ltd (Lands Lease) | Tourism |
| Lot 44 | LN2831 | 1.794 | GKI Resort Pty Ltd (Lands Lease) | Tourism |
| Lot 8 | LN2832 | 8.109 | GKI Resort Pty Ltd (Lands Lease) | Tourism |
| Lot A | AP2516 | 0.107 | GKI Resort Pty Ltd (Lands Lease) | Tourism |
| Lot A | AP5428 | 0.037 | GKI Resort Pty Ltd (Lands Lease) | Tourism |
| Total Area | | 914.1 | | |

In addition to the land currently leased by the Proponent (**Table 2.1**), the following leases are required for the GKI Revitalisation Plan¹:

- Lot 1 AP16085 (no title) 19.4 hectares, State Land (SL), for the airstrip (refer **Figure 2.4**)²;
- Lot 11 AP11326 (no title) 4.8 hectares, SL, for the airstrip (refer **Figure 2.4**);
- Lot 8 SP129154 2.99 hectares, Reserve, for the airstrip (refer **Figure 2.4**);
- volumetric road closure of gazetted road reserve, for the airstrip (refer **Figure 2.7**)³;
- area required for the marine facility 31.5 hectares (refer **Figure 2.7**); and
- area required for the utilities services corridor (power and telecommunications cables and water supply pipeline) between the mainland and the Island (refer **Appendix Q**).

The total area of the Island required to facilitate the GKI Revitalisation Plan (inclusive of the Environmental Protection Precinct and exclusive of the marina) is 941 hectares (refer **Section 2.2.3.1** for further information) The remainder of the island tenure is held by individual freehold or leased blocks, Council or State lands and Woppaburra land.

1. A permit to occupy under the Land Act 1994 for the purpose of "Investigation only" for the permittee GKI Resort Pty Ltd applies to Lot 1 AP16085 and Lot 11 AP11326 (the proposed airstrip area).

2. A permit to occupy under the Land Act 1994 for the purpose of "Investigation only" for the permittee GKI Resort Pty Ltd applies to Lot 1 AP16085 and Lot 11 AP11326 (the proposed airstrip area).

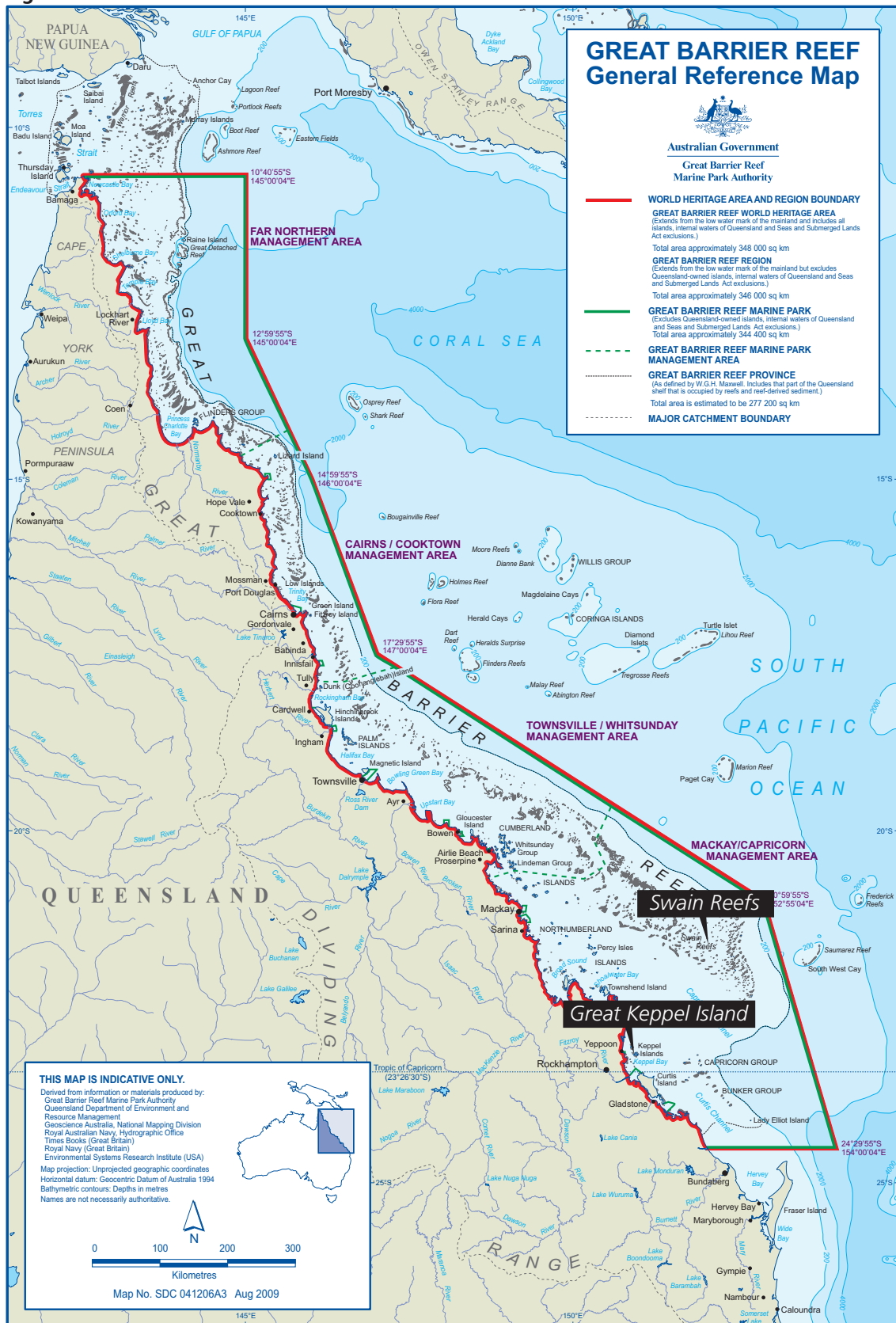
3. A permit to occupy under the Land Act 1994 for the purpose of "Investigation only" for the permittee GKI Resort Pty Ltd applies to Lot A on AP20991 (the proposed marine facility area).

Figure 2.2 AERIAL PHOTOGRAPH GREAT KEPPEL ISLAND



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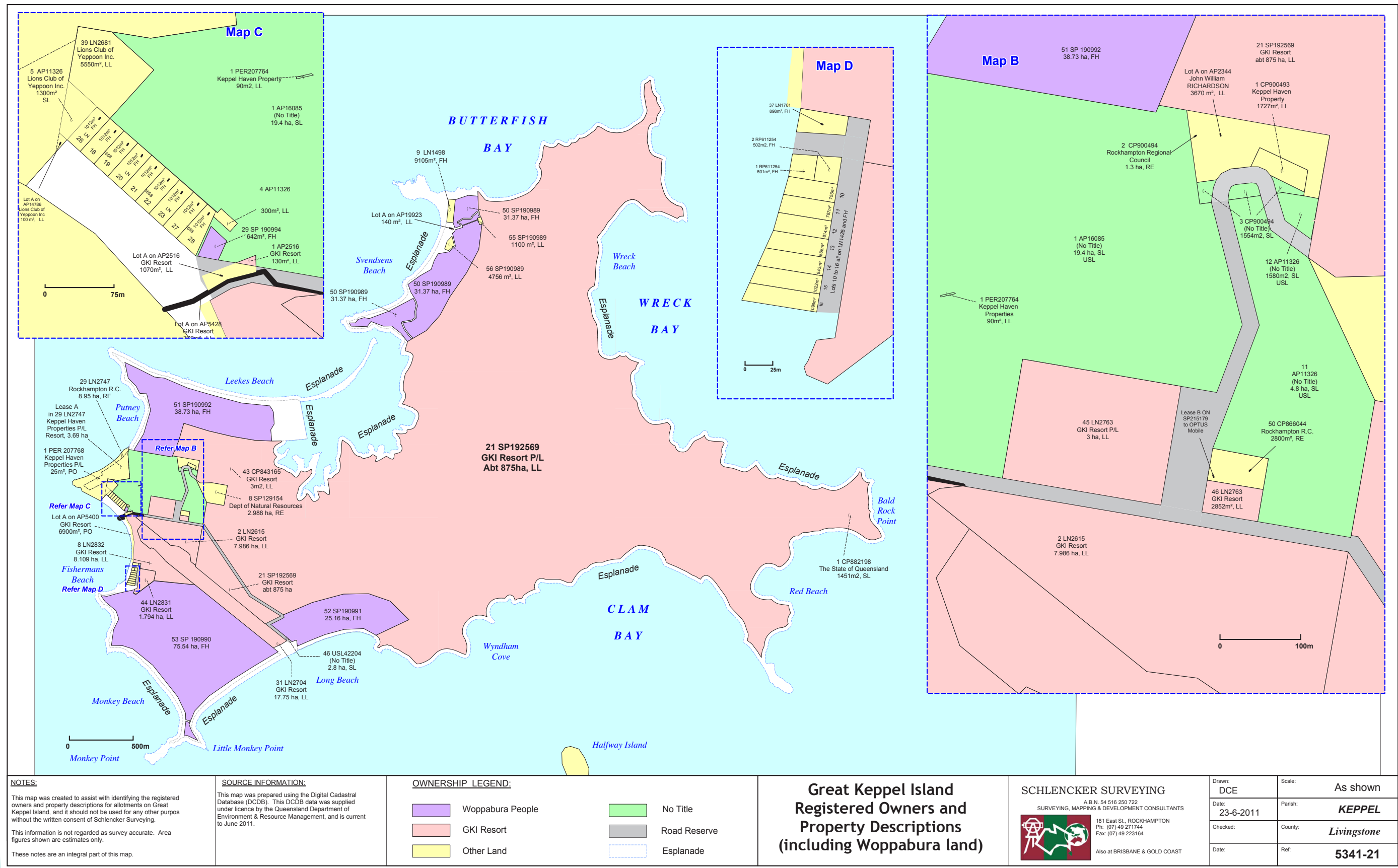
Figure 2.3 PROJECT LOCATION IN THE CONTEXT OF THE GBRWHA





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Figure 2.4 LAND TENURE MAP





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2.2 Overview of the Project

The GKI Revitalisation Plan (**Figure 2.5** and **Figure 2.6**) will see the transformation of the former GKI Resort which was closed in 2008, into a world-class ecologically sustainable tourist resort destination.

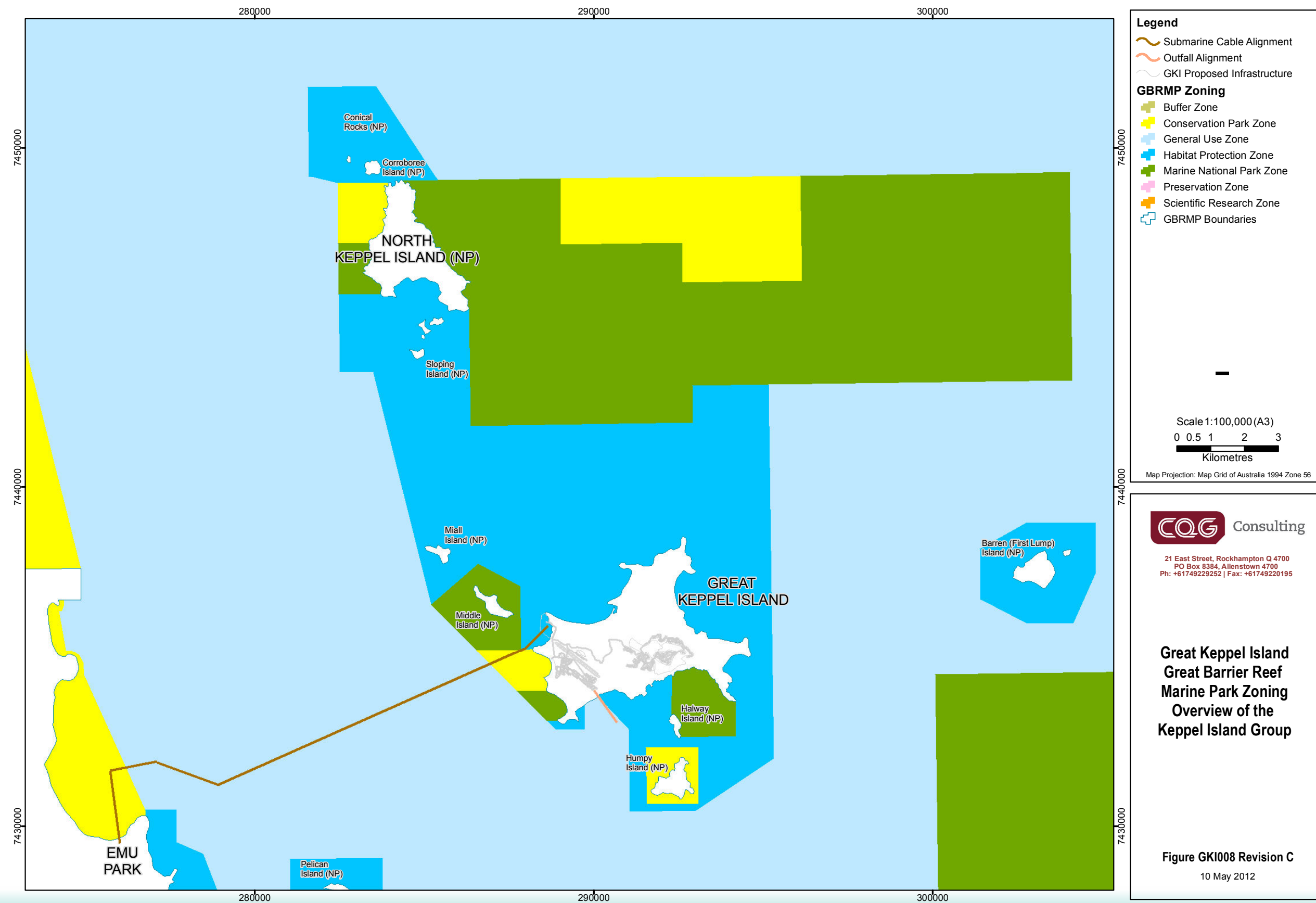
The GKI Revitalisation Plan has been designed through an environmental, world heritage, cultural and visual constraints based approach to ensure the development results in minimal disturbance to the natural environment. Several project alternatives as discussed in **Section 1.5** have been considered during the design process to ensure minimal impact.

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Figure 2.5 GREAT KEPPEL ISLAND RESORT REVITALISATION PLAN



Figure 2.6 SUBMARINE CABLE





2.2.1 GKI Revitalisation Plan Design Objectives

The GKI Revitalisation Plan is underpinned by the following design objectives:

- to seek to ensure the ecological and sustainable development of the GKI Resort;
- to respect and protect the OUV of the GBRWHA;
- to conserve the superlative natural phenomena and areas of exceptional natural beauty and aesthetic importance on the Island;
- to protect the biodiversity, terrestrial and aquatic ecosystem function, of the Island and surrounding marine environment;
- to provide equitable, safe and convenient access to the Island by air and by sea;
- to ensure that the design is responsive to the effects of climate change, including sea level rise and storm surge impacts;
- to promote a built form typology that:
 - integrates with and is subordinate to the natural environment in terms of scale, bulk, materials and colour;
 - passively and actively responsive to the Island's mild sub-tropical climate; and
 - complements the Queensland sub-tropical modern architectural design aesthetic.
- to respect and enhance the Island's existing landscape character and utilise endemic plant species where possible in revegetation and landscaping; and
- to provide physical infrastructure commensurate with the intended scale and density of development.

These objectives led the development of the 'Great Keppel Island Resort Revitalisation Plan – Plan of Development' (Plan of Development) which provides a planning framework for the future development of the Island (refer **Appendix N**).

The over-arching objectives for the Project are the objectives identified in the EPBC Act and GBRMP Act.

EPBC Act Objectives -

- to provide for the protection of the environment, especially those aspects of the environment that are MNES;
- to promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resources;
- to promote the conservation of biodiversity;
- to promote a co-operative approach to the protection and management of the environmental involving governments, the community, land-holders and Indigenous peoples;





- to assist in the co-operative implementation of Australia's international environmental responsibilities;
- to recognise the role of Indigenous people in the conservation and ecologically sustainable use of Australia's biodiversity; and
- to promote the use of Indigenous peoples knowledge of biodiversity with the involvement of, and in co-operation with, the owners of the knowledge.

2.2.1.1 Principles of Ecologically Sustainable Development

The EPBC Act outlines the following principles of Ecologically Sustainable Development.

- decision making processes should effectively integrate both long term and short term economic, environmental, social and equitable considerations;
- if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation;
- the principle of inter-generational equity - that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations;
- the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision making; and
- improved valuation, pricing and incentive mechanisms should be promoted.

GBRMP Act Objectives -

The main object of this Act is to provide for the long term protection and conservation of the environment, biodiversity and heritage values of the GBR Region.

The other objects of this Act are to do the following, so far as is consistent with the main object:

- allow ecologically sustainable use of the GBR Region for the purposes including the following:
 - public enjoyment and education
 - public education about and understanding of the Region
 - recreational, economic and cultural activities
 - research in relation to the natural, social, economic and cultural systems and values of the GBR Region
- encourage engagement in the protection and management of The GBR Region by interested persons and groups, including Queensland and local governments, communities, Indigenous persons , business and industry;
- assist in meeting Australia's international responsibilities in relation to the environment and protection of world heritage (especially Australia's responsibilities under the World Heritage Convention); and





- The principles of ESD have been a driving factor in the development of the GKI Revitalisation Plan. The cornerstone of the GKI Revitalisation Plan's ESD initiatives is a commitment to the use of renewable energy by embracing one of Australia's most significant natural resources, its abundant sunshine. The GKI Revitalisation Plan has adopted an ambitious sustainability strategy to produce more clean renewable energy than it consumes each year. This is a specific and targeted response by the proponent to begin to address the issue of climate change.

2.2.1.2 Revitalisation Plan Architectural Ethos

The architectural design for the GKI Revitalisation Plan has been prepared by one of the world's leading design firms for the hospitality, leisure and entertainment industries, WATG (more information can be found at the firm's website: www.watg.com and **Appendix M**).

WATG has a legacy of environmentally sensitive planning, architecture and design. A hallmark of WATG is its sensitivity to the influences of the local culture, the natural environment, the people and the spirit of the location.

WATG has practiced environmental and cultural design sensitivity for as long as the firm has been in existence: more than 60 years. Having designed projects in more than 150 countries and territories, the firm respects the unique environment and cultural heritage of each host country, region or community, and works to make a positive contribution to the lives and culture of that area. Their mission is *"to design experiences that lift the spirit."*

2.2.2 Resort Accommodation and Management

The key design objective for the GKI Revitalisation Plan tourism accommodation is to ensure that it remains low rise (three-storey maximum) and that the built form will not dominate the Island's natural landscape. In a report titled a *Summary Report - Building Height Surveys prepared for Livingstone Shire Council* (c.2004) the majority of respondents agreed that a three storey maximum building height for all general residential areas (in the shire), all rural areas and local business was preferred. The survey identified that the three storey building limit was equal to 12 metres. Following the responses from this survey the GKI Revitalisation Plan will also adopt the equivalent building heights as preferred by the community and each storey referred to throughout this document or within **Appendix N** is equal to four metres.





Three types of accommodation are proposed:

- *Fisherman's Beach Hotel* – fully serviced suites with a full array of resort amenities;
- *Eco Resort Villas* – a low-rise, climate responsive (active and passive), resort accommodation option. The Eco Resort Villas will be free-standing and positioned within the natural topography of the Island. They will incorporate ESD design features; including roof top solar panels, solar hot water, rainwater tanks and be designed to maximise natural solar access and natural ventilation. The Eco Resort Villas will be ideally suited for tourist families or couples and will comprise an open plan layout, verandah, two/three bedrooms and kitchen facilities. The architecture of the Eco Resort Villas will be focussed on ensuring that they blend into the natural landscape and that their visual impact from the marine waters and the Island itself will be minimised; and
- *Eco Resort Apartments* – alternative compact accommodation options, within a low-rise climate responsive built form. The Eco Resort Apartments will include similar sustainability features to the Eco Resort Villas. In contrast to the Eco Resort Villas, the Eco Resort Apartments will provide guests with a more compact form of accommodation and be located around the marina and within proximity to the Fisherman's Beach Hotel.

The Fisherman's Beach Hotel will be managed by an internationally recognised hotel management group. Discussions have commenced between the Proponent and various providers, with a contract to be awarded post-approvals. It is imperative that a strong management group be appointed for the Hotel as this will be a focal point of the Resort.

The Eco Resort Villas and Eco Resort Apartments will be available for purchase by individuals, although centrally managed by the Proponents GKI Resort Pty Ltd from the Island management office.

Tourists wishing to make a booking at the Resort will be able to either contact the management office direct, or book online through the website. The Resort will establish relationships with other domestic and international booking agencies and tourism offices to promote the Region and arrange bookings.

Permanent residential accommodation will not be part of the GKI Revitalisation Plan.



2.2.3 Revitalisation Plan Resort Precincts

Four resort precincts (refer **Figure 2.6**) are proposed by the Plan of Development (refer **Appendix N**):

- Environmental Protection Precinct;
- Fisherman's Beach Precinct;
- Clam Bay Precinct; and
- Marine Services Precinct.

2.2.3.1 Revitalisation Plan Footprint

The proposed GKI Revitalisation Plan footprint, including precinct areas and the total infrastructure footprint is provided in **Table 2.2**.

TABLE 2.2 REVITALISATION PLAN FOOTPRINT

| | Precinct Area ¹ (hectares) | Infrastructure Footprint ² (hectares) | Infrastructure Footprint as a Percentage of Island Area ³ | Infrastructure Footprint as a Percentage of Total Area of All the Keppel Islands ⁴ |
|-----------------------------------|--|---|--|---|
| TERRESTRIAL PRECINCTS | | | | |
| Environmental Protection Precinct | 575 | 0 | 0 percent | 0 percent |
| Fisherman's Beach Precinct | 141 | 27 | 2.06 percent | 1.23 percent |
| Clam Bay Precinct | 225 | 19 | 1.45 percent | 0.86 percent |
| Total Area | 941 | 46 | 3.52 percent | 2.09 percent |
| MARINE PRECINCTS | | | | |
| Marine Services Precinct | 31.5 | 20.8 | - | - |
| ALL PRECINCTS | | | | |
| Total Area | 972.5 | 104.8 | - | - |

Notes:

- 1 Precinct areas are approximate only. Accurate determination of precinct areas and project area will be subject to detailed survey of the Island perimeter and associated land title amendments.
- 2 Infrastructure footprint includes roads, buildings, airstrip, marina and other impervious physical infrastructure.
- 3 Total Island area is approximately 1,308 hectares, including 1,214.29 hectares of land title and approximately 94 hectares of Island esplanade.
- 4 The total area of the Keppel Islands is approximately 2,200 hectares.

The Clam Bay Precinct also contains, approximately 38 hectares of area is required for the establishment of the golf course (including but not limited to fairways, tees, bunkers). This area represents 2.91 percent of the Island and 1.73 percent of all Keppel Islands.

In addition to the infrastructure footprints identified in **Table 2.2** additional areas will be impacted upon by vegetation clearing, earthworks and other direct disturbance for access and lay-down areas. Potential environmental impacts, including vegetation clearing necessary to facilitate the GKI Revitalisation Plan is provided in **Section 3.2**.

Figure 2.7 PLAN OF DEVELOPMENT RESORT PRECINCTS

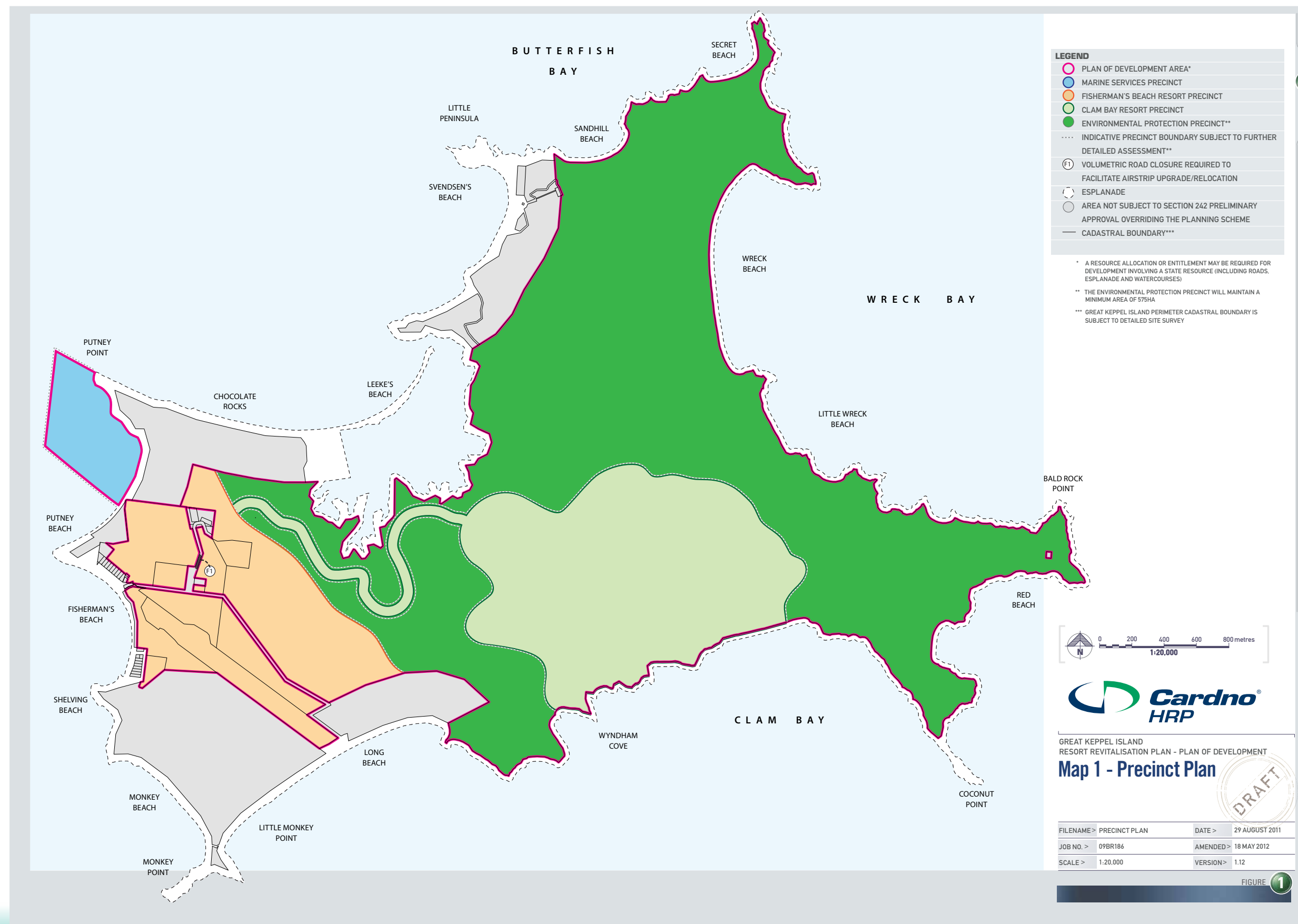
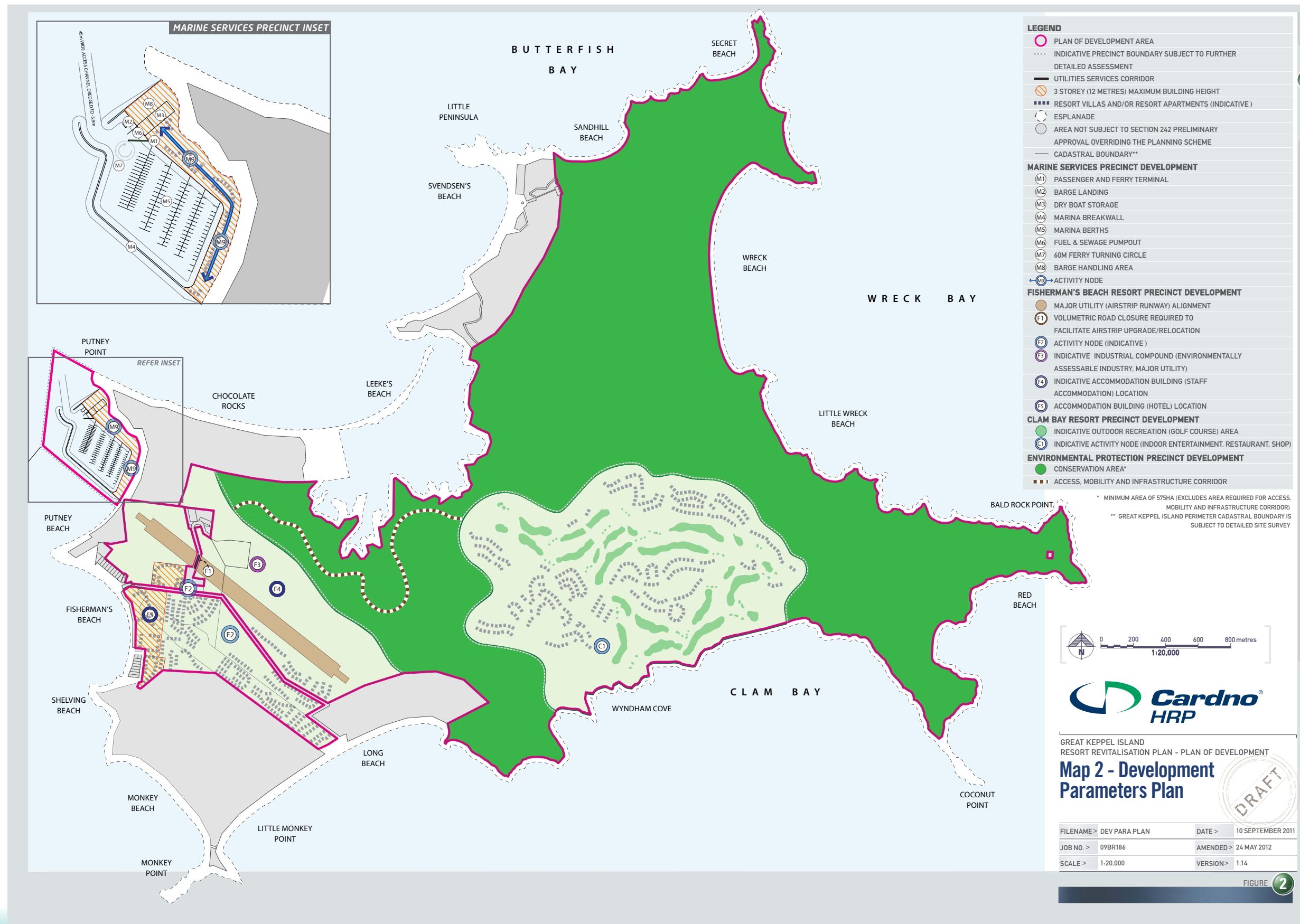


Figure 2.8 DEVELOPMENT PARAMETERS PLAN





2.2.3.2 Environmental Protection Precinct

The majority of Lot 21 will be dedicated in an Environmental Protection Precinct, of which a minimum area of 575 hectares will be rehabilitated and protected (refer **Figure 2.7** and **2.8**). The areas contained within the Environmental Protection Precinct are proposed to have a 'Conservation' lease purpose (under a Lands Lease). Environmental management initiatives for the Environmental Protection Precinct are identified in **Appendix O – Environmental Management Plan** and includes but is not limited to weed and pest management in accordance with a Weed and Pest Animal Management Plan, including in particular the eradication of the Island's feral goat population.

The Environmental Protection Precinct will provide for the rehabilitation, ongoing maintenance, management and protection of the environment; including culturally significant sites, and the Island ecology.

The proposed Plan of Development (refer **Appendix N**) identifies overall outcomes for the Environmental Protection Precinct including:

- locate consistent development within the Environmental Protection Precinct as delineated on Plan of Development Map 1 – Precinct Plan (refer also **Figure 2.7**);
- protect a minimum area of 575 hectares;
- protect the ecological values and ecological function of the Environmental Protection Precinct;
- rehabilitate areas within the Environmental Protection Precinct where the natural environment is degraded and requires enhancement; and
- provide ecological education opportunities, including passive recreational walking trails for nature appreciation within the Environmental Protection Precinct where the ecological significance of the area is not negatively impacted.

Allocation of land for the Environmental Protection Precinct and the implementation of the above initiatives by the Proponent are dependent on the following key aspects of the GKI Revitalisation Plan which will provide the necessary funding for the rehabilitation and restoration of the Island:

- the provision of safe, efficient and equitable air transportation to the Island which enables direct flights from Brisbane, Cairns, Sydney and Townsville requiring the relocation and upgrade of the existing airstrip to accommodate aircraft capable of undertaking these direct flights;
- the provision of safe, all weather water-based access to the Island in the form of a new marina;
- the inclusion of an 18 hole championship golf course that is integral to the sustainable water cycle management plan for the Island and reported by the Proponent to be critical to be competitive in the Australian and South-East Asia tourism market (refer **Section 2.2.3.4**); and
- a range of tourist accommodation and retail/commercial activities to broaden the former resort's tourist market and to establish a high quality, sustainable, carbon (energy) positive, built form typology that respects the World Heritage Values of this Australian island asset.



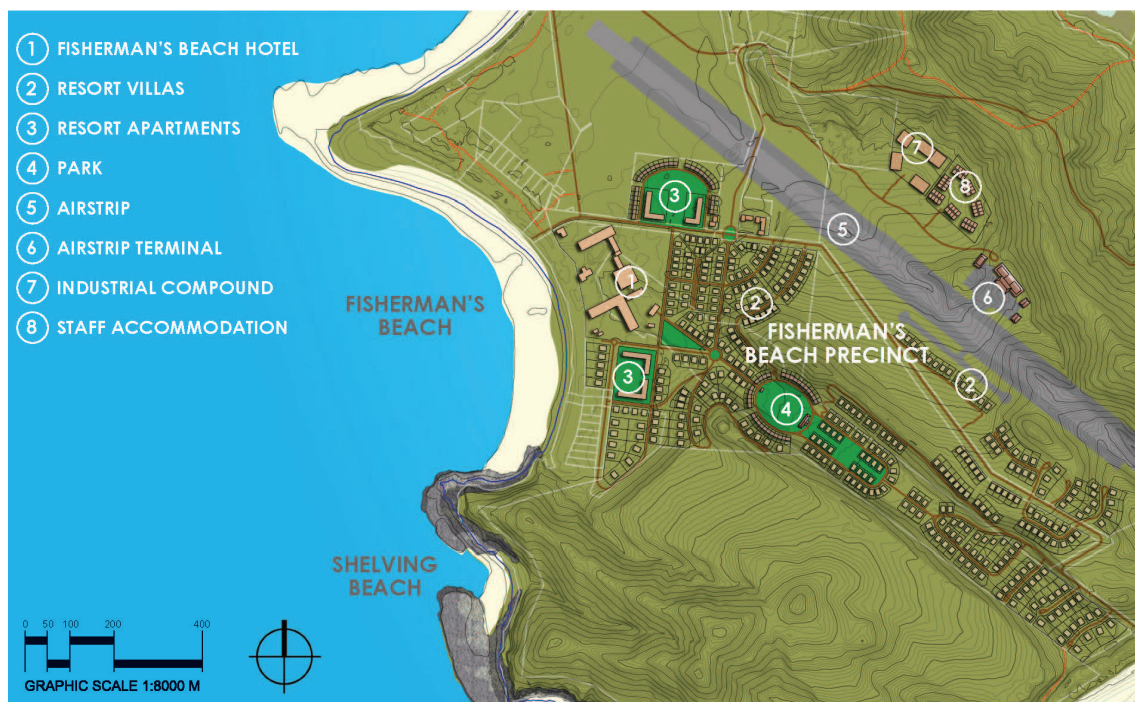


2.2.3.3 Fisherman's Beach Precinct

The Fisherman's Beach Precinct, located in the south-west of the Island (refer **Figure 2.5** and **2.9**) will predominantly comprise an upgraded and relocated airstrip, Fisherman's Beach Hotel and a range of supporting tourist accommodation including Eco Resort Villas and Eco Resort Apartments.

This precinct will be developed as a lively and active tourism node and will complement the range of activities occurring in the Marine Services Precinct. The site planning and architecture of the Fisherman's Beach Precinct is also intended to complement the natural environment and will adopt styles and colours that reflect the landscape. The existing hillside villas, with their reflective white roofs will be demolished and replaced with Eco Resort Villas which, in accordance with the overarching design philosophy for the GKI Revitalisation Plan will integrate with the existing landscape.

Figure 2.9 FISHERMAN'S BEACH PRECINCT



Source: Modified from 'Great Keppel Island Resort – Revitalisation Plan' (2011) - WATG

The Fisherman's Beach Hotel (refer **Figure 2.9**) will be located in a beach-front position along the most popular beach on the Island, Fisherman's Beach. Located on the site of the former resort hotel, the new Fisherman's Beach Hotel will be integral to the GKI Revitalisation Plan and will be the focal point of this precinct.



A variety of other accommodation types are proposed in addition to the Hotel; including Eco Resort Villas and Eco Resort Apartments. The accommodation mix is intended to provide a variety of options to meet the diverse interests of the tourist market and to maintain a compact urban form that also fosters a resort village ambience. The resort village will extend into areas occupied by the existing airstrip and will accommodate Eco Resort Villas in a relaxed subtropical landscaped resort setting. Dedicated public access will also be made available between Fisherman's Beach and Long Beach.

Figure 2.10 provides an artistic impression of the Fisherman's Beach Precinct.

Figure 2.10 FISHERMAN'S BEACH PRECINCT VISUAL IMPRESSION⁴



Colours and layout of the Hotel will be designed to blend into the surrounding environment to minimise visual impact.

4. **Figure 2.10** is an artistic impression only. Refer to **Section 3.2.2** for visual impact assessment.

The proposed Plan of Development (refer **Appendix N**) identifies overall outcomes for the Fisherman's Beach Precinct which seek to:

- locate consistent development within the Fisherman's Beach Precinct including:
 - an upgraded and relocated airstrip and associated terminal facilities capable of accommodating aircraft direct from Brisbane, Cairns, Sydney, Townsville and other capital cities and regional areas;
 - a low-rise (three storey) Resort Hotel and supporting facilities including but not necessarily limited to tourist resort accommodation comprising 250 accommodation units, reception and administration activities, restaurants, swimming pools, day spa, and conference rooms (up to 40,000m² gross floor area (GFA));
 - low-rise (two storey) tourist resort accommodation in the form of up to 440⁵ Eco Resort Villas (up to 165,000m² GFA) and up to 185⁶ Eco Resort Apartments (up to 46,250m² GFA);
 - up to 200 staff accommodation units (up to 16,000m² GFA);
 - a limited activity node incorporating shop, restaurant, take-away food store, and office activities (up to 2,000m² GFA); and
 - physical infrastructure, including but not limited to a wastewater treatment plant commensurate with the scale and density of development within the Marine Services Precinct and Fisherman's Beach Precinct; a waste transfer facility for the Resort; and an emergency standby diesel electricity generation plant.
- to protect the ecological integrity of the coastal, hydrological (including groundwater) and marine environment at Fisherman's Beach and immediate inland environs;
- to provide active and passive recreation facilities including a sports field and discrete parks; and
- to provide pedestrian, electric mobile resort vehicle (EMRV), buggys and service vehicle access between the Fisherman's Beach Precinct, Marine Services Precinct and Environmental Protection Precinct.

5. The Plan of Development provides for redistribution of Eco Resort Villas between the Fisherman's Beach Precinct and the Clam Bay Precinct where the maximum overall number of Eco Resort Villas does not exceed 750.

6. The plan of the Development provides for redistribution of Eco Resort Apartment, between Fisherman's Beach Precinct and the Marine Services Precinct where the maximum overall number of Eco Resort Apartments does not exceed 300.

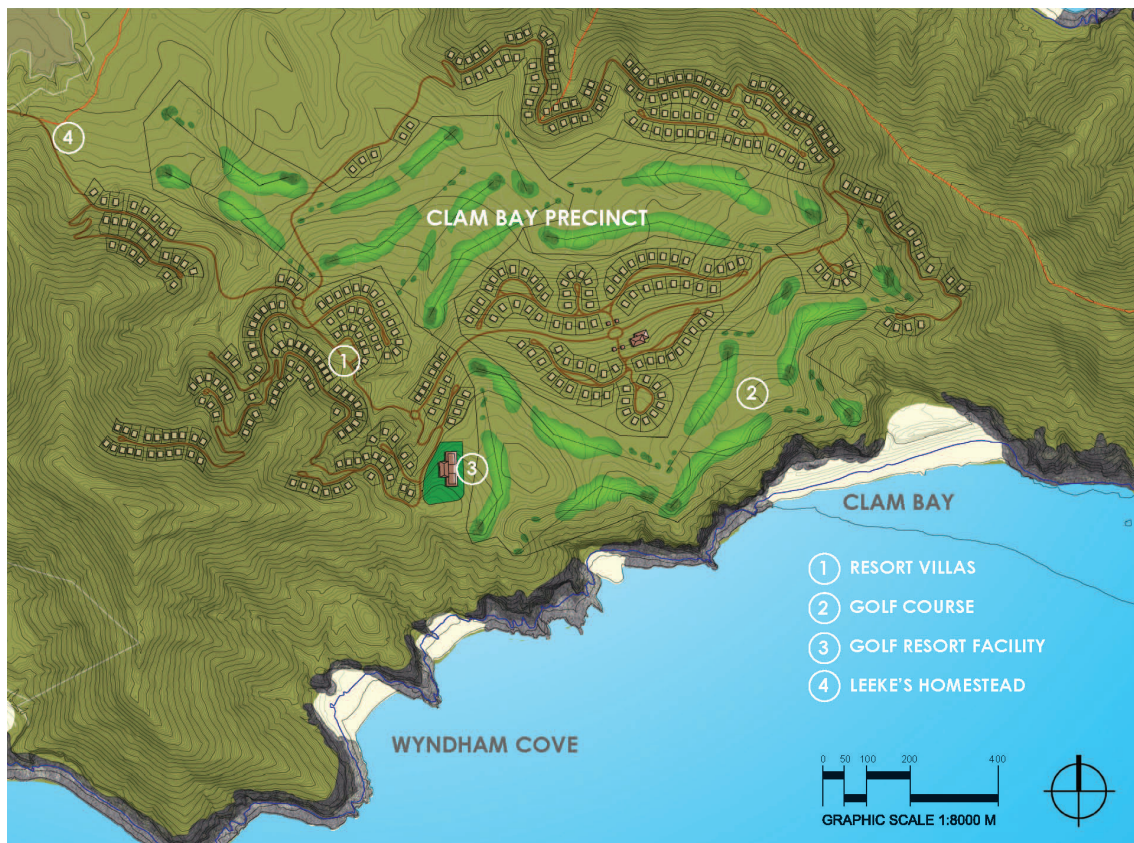
2.2.3.4 Clam Bay Precinct

The Clam Bay Precinct, located central to the Island (refer **Figure 2.5** and **2.11**) will predominantly comprise an 18 hole championship golf course, designed by Greg Norman Golf Course Design incorporating low rise Eco Resort Villa accommodation.

The Clam Bay Precinct is to include:

- up to 422 Eco Resort Villas (up to 158,250m² Gross Floor Area (GFA))⁷; and
- 2,500m² GFA for other uses including the Clam Bay Golf Club and complementary activities including restaurants, shops and indoor entertainment facilities.

Figure 2.11 CLAM BAY PRECINCT



Source: Modified from 'Great Keppel Island Resort – Revitalisation Plan' (2011) - WATG

7. The Plan of Development provides for redistribution of Eco Resort Villas between the Fisherman's Beach Precinct and the Clam Bay Precinct where the maximum overall number of Eco Resort Villas does not exceed 750.

The Clam Bay Precinct is located on the land previously used as a sheep grazing operation and during its history has been subject to vegetation clearing practices, which has left a legacy of weed infestation.

Careful consideration of the potential impacts on the environment and the GBR World Heritage Values were taken into account in the planning and design of this precinct in order to realise a resort landscape that will complement the Island's natural values. In particular, the design process sought to ensure that:

- the ecological and hydrological processes of the Island are not unacceptably impacted upon;
- there will be no adverse runoff into the wetlands located behind Leeke's Beach or into the Marine Park; and
- the visual impact of the Clam Bay Precinct will result in minimal impact on World Heritage Values.

Figure 2.12 provides a visual impression of the Clam Bay Precinct. Refer **Appendix AL** for a detailed visual impact assessment on the Project.

Figure 2.12 CLAM BAY PRECINCT VISUAL IMPRESSION⁸



8. **Figure 2.12** is an artistic impression only. Refer to **Section 3.2.2** for visual impact assessment.

Figure 2.13 provides an indicative visual impression of the siting of a Eco Resort Villa within the proposed golf course landscape⁹.

Figure 2.13 ECO RESORT VILLA LANDSCAPE AND SITING IMPRESSION



The proposed Plan of Development (refer **Appendix N**) identifies the following overall outcomes for the Clam Bay Precinct which seek to:

- locate consistent development within the Clam Bay Precinct, including:
 - provide outdoor recreation activities including an 18 hole golf course and supporting facilities including but not necessarily limited to a driving range, licensed club-house (indoor recreation), reception and administration activities, restaurant, shops, gymnasium and swimming pools;
 - low-rise (two storey) tourist resort accommodation in the form of upto 422¹⁰ Eco Resort Villas; and
 - physical infrastructure, including but not limited to a sewage treatment plant commensurate with the scale and density of development within the Clam Bay Precinct and associated golf course wastewater reuse area;
- protect the ecological integrity of the environment, including the maintenance of functional hydrological flows. In particular the wetland and estuarine system landward of Leeke's Beach is to be conserved and protected from the adverse impacts of development including runoff associated with the golf course;

9. Please note that **Figure 2.13** is a visual impression only and is not indicative of the architectural design of Eco Resort Villas, which will be subject to further detailed design.

10. The Plan of Development provides for redistribution of Eco Resort Villas between the Fisherman's Beach Precinct and the Clam Bay Precinct where the maximum overall number of Eco Resort Villas does not exceed 750.



- promote a low-rise visually unobtrusive built form (up to a maximum height of two storeys); and
- provide pedestrian, EMRV, buggys and service vehicle access within the Clam Bay Precinct including connections to the Environmental Protection Precinct.

(a) Golf Course

There is currently a nine hole golf course located on the Island, immediately inland of the former resort hotel at Fisherman's Beach (refer **Photograph 2.1**) which was a key marketing feature of the former resort operation and was also used to dispose of treated wastewater by irrigation.

The proposed Clam Bay Precinct golf course is integral to the wastewater treatment system for the proposed resort development. It will be designed to integrate existing native vegetation and natural waterways and will include areas rehabilitated with endemic flora species. Excavation and vegetation clearing will be limited to areas of less than five percent slope to minimise visual exposure. Grass species will, where possible be endemic to the Island and will feature drought tolerance and low-fertilizer characteristics to minimise inputs typically associated with golf courses in more urban areas.

As discussed previously the golf course will occupy an area of the Island that has been subject to historical grazing and agricultural practices, including vegetation clearing, fencing and stocking.

Photograph 2.1 FORMER RESORT GOLF COURSE (IN ITS OPERATIONAL STATE)





Throughout the GBR, there are numerous examples of Islands which have golf courses, including; Dunk Island, Dent Island, Lindeman Island, South Molle Island and Magnetic Island. Daydream Island also contains a 19 hole putt-putt golf course. Each of these island resorts strongly market their golf courses in order to attract and retain guests for extended holidays on the Island.

The proposed golf course is an essential component for the viability and sustainability of the Resort due to its appeal to prospective tourists and its high amenity value. The golf course will enable the Resort to provide more facilities and more recreational options than would otherwise be available, thereby enhancing the Resort's competitiveness as a visitor destination and its value to the Capricorn Coast.

As noted the proposed golf course will not only act as a significant tourist attraction but will also be an essential component of the Resort's total water cycle management regime. That is, the proposed water management infrastructure intends to treat wastewater to a tertiary standard (refer to **Appendix AN**) and then reuse this treated wastewater to irrigate the golf course. This will allow sustainable wastewater treatment and eliminate the need to redirect the wastewater to the mainland and/or discharge it into the marine environment as is the case on many other island resorts. Robust modelling of this wastewater irrigation has been completed by specialists to inform the design of the system to ensure no adverse impact on groundwater sources, waterways or marine waters.

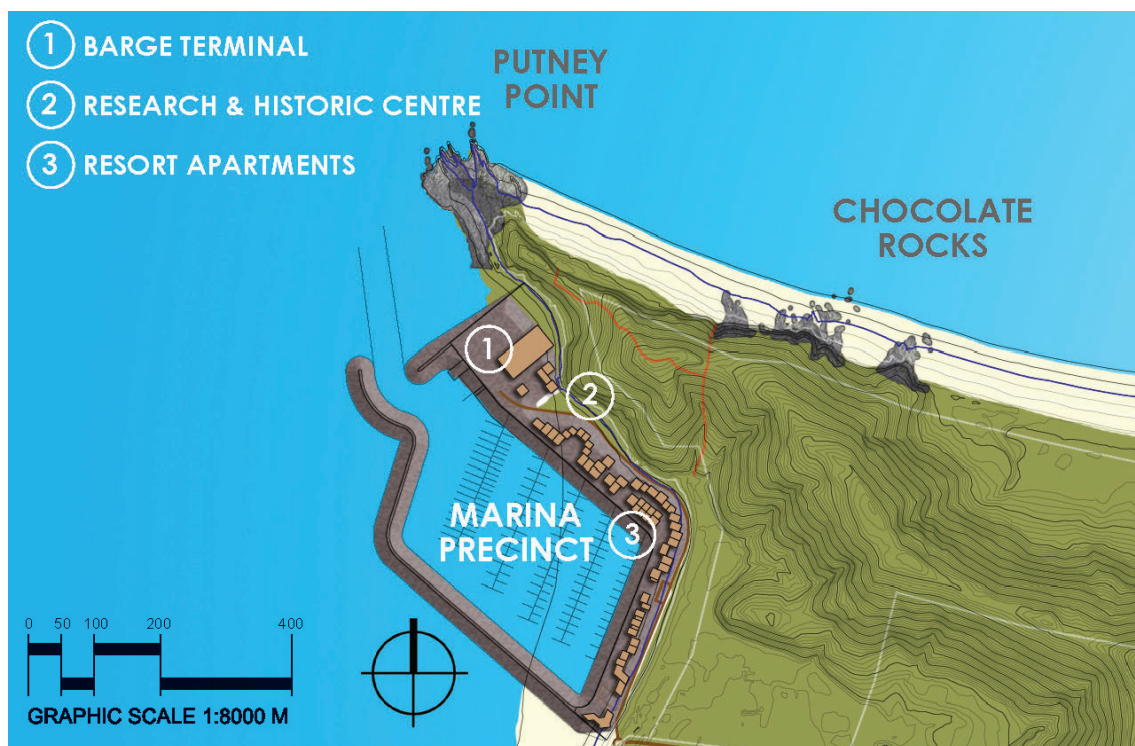


2.2.3.5 Marine Services Precinct

The Marine Services Precinct which will be located in the north-west of the Island (refer **Figure 2.5, 2.6** and **2.14**) will include a marina, barge and ferry terminal, restaurants and shops, the GKI Research Centre and Eco Resort Apartments.

The proposed marina facility is an integral and essential component of the GKI Revitalisation Plan. Central Queensland is relatively under-supplied with regard to marine facilities in comparison with the rest of Queensland. A new marina at the Island would represent a major piece of tourism infrastructure for the Region and complement the mainland marina at Rosslyn Bay. Further information regarding the justification and location of the Marine Services Precinct is provided in **Section 1.5.2** of the EIS and details regarding the proposed design and operation of the proposed marina are included in **Appendix AD**.

Figure 2.14 MARINE SERVICES PRECINCT



Source: Modified from 'Great Keppel Island Resort – Revitalisation Plan' (2011) - WATG



The Marine Services Precinct will accommodate an active mixed use waterfront village intended to appeal to day visitors and resort guests to this area during the day and night.

The proposed Plan of Development (refer **Appendix N**) identifies overall outcomes for the Marine Services Precinct, including to:

- locate consistent development within the Precinct including:
 - a 250 berth marina and associated facilities including but not necessarily limited to a passenger, barge and ferry terminal, dry boat storage, and sewage pump-out facility. All of these facilities will be made available to the general public at market rates;
 - low-rise (three storey) tourist resort accommodation in the form of approximately 185 tourist accommodation units (up to 46,250m² GFA)¹¹ that visually integrates with the headland and forested mountain backdrop; and
 - a community and tourism activity node incorporating shops, restaurants, take-away food stores, offices and Sale or Hire Premises activities (up to 7,000m² GFA).
- provide pedestrian, EMRV, buggys and service vehicle access between the Marine Services Precinct and Fisherman's Beach Precinct;
- protect the ecological integrity of the coastal and marine environment at Putney Beach and surrounds;
- undertake remediation, rehabilitation and stormwater quality control works associated with Putney Creek to improve and maintain the hydrological and aquatic ecology of the Putney Creek system;
- provide facilities for scientific marine based research and to show-case the Indigenous and historic cultural heritage of the Island via the research centre and/or museum based activities;
- ensure that the Precinct activities do not intrude upon the operational airspace of the Island; and
- ensure non-accommodation uses are designed and configured in a manner that optimises the amenity of Eco Resort Apartment and Accommodation Building uses.

Access to the marina facility is proposed over a small area of Unallocated State Land (USL) and will require necessary approvals from the DNRM. Access to the marina and the marina footprint does not include any of the land owned by the Woppaburra Land Trust.

11. The plan of the Development provides for redistribution of Eco Resort Apartment, between Fisherman's Beach Precinct and the Marine Services Precinct where the maximum overall number of Eco Resort Apartments does not exceed 300.



(a) Marina

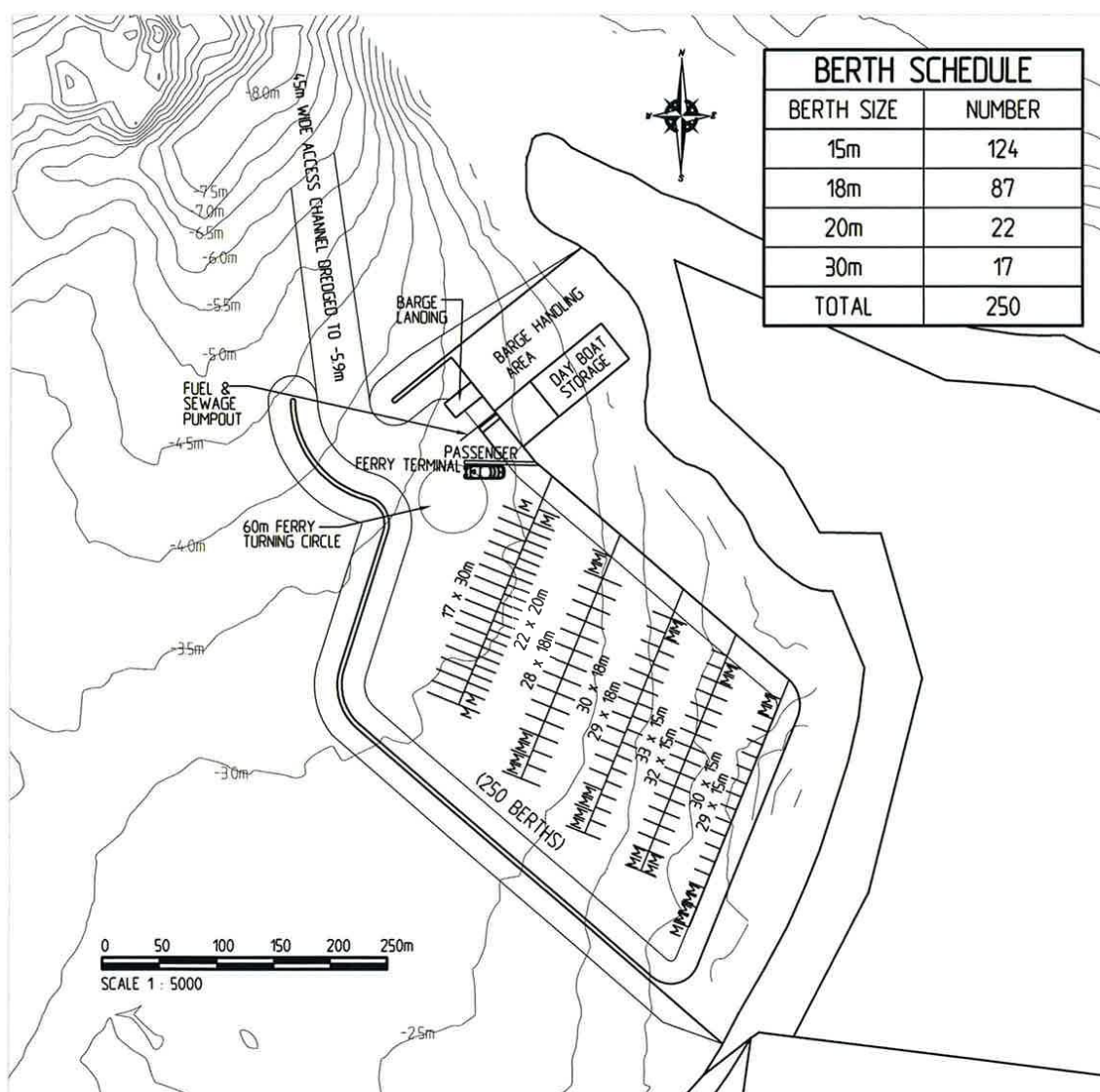
The marina will be designed to allow for safe and efficient access to the Island by sea and will be an important part of the transport infrastructure required for the GKI Revitalisation Plan. Accessibility is vital to the successful operation of an isolated island resort and the new marina will ensure equitable access to the Island. Refer to **Section 1.6.2.2** for further information on alternatives for a marina and jetty on the Island.

The marina design comprises the following attributes:

- a mix of berth sizes to suit anticipated demand with a maximum berth size of 30 metres;
- a preliminary marina berths layout (refer **Figure 2.15**) designed in accordance with AS3962-2001 Guidelines for Design of Marinas;
- configuration to provide for barges and ferries up to 40 metres overall length;
- the harbour entrance and breakwater have been configured to provide a safe all-weather haven for vessels and minimise entrance channel length to deep water; and
- an entrance channel depth at the lowest Astronomical Tide of 3.5 metres and 4.7 metres for Mean Low Water Spring Tide.

Figure ES.5 illustrates the south-west and north-west entrance channels and clearly highlights the reduced channel length of the north-west option.

Figure 2.15 PRELIMINARY MARINA BERTHS LAYOUT



1. CONTOURS ARE SHOWN IN METRES AND REDUCED TO AHD
2. CHART DATUM IS 2.4m BELOW AHD

FIGURE 2

Source: 'Marina and Vessel Management Aspects' (2011) – International Marina Consultants



Further details in regard to the proposed design and the function and operation of the marina are provided in **Appendix AD**.

Detailed environmental investigations were undertaken throughout the EIS process to assess the potential environmental impacts which may arise from the construction of the marina (refer **Section 3**). Investigations included consultation with officers from GBRMPA and MSQ who were instrumental in encouraging the Proponent to adopt innovative engineering and design solutions into the marina design.

Key areas identified during the EIS process which would reduce potential environmental impacts from the marina construction included:

- design of an alternative entrance channel route to significantly reduce the length of the entrance channel;
- assessment of alternative construction options to reduce the amount of rock armour that would be required to be transported to the Island for the breakwall construction; and
- implementation of construction methods to prevent the need for sea disposal of dredge material.

Detailed hydrographic surveys were conducted and seabed contours were developed by coastal engineers. These studies confirmed that there is a navigable channel from the north of the marina that would allow the entrance channel to be re-aligned from the south-west to the north-west. The result of this re-alignment reduced the length of the entrance channel from the original design by over 1,070 metres, significantly reducing the volume of material to be dredged - refer to **Figure ES.5** (Marina Entrance Channel Options).

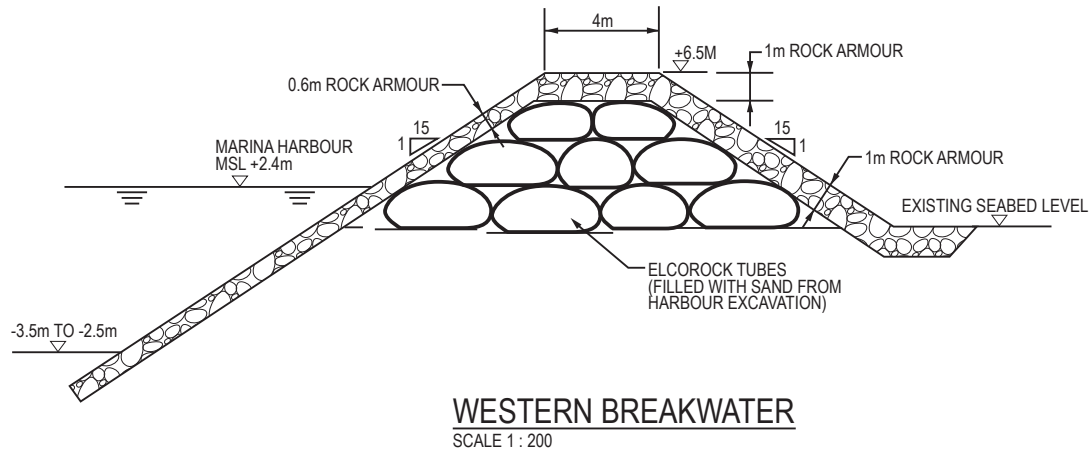
The GKI Revitalisation Plan proposes to reuse all of the marina basin dredge material to either:

- form the core of the breakwaters – constructed with geotextile containers and filled with sediment excavated from the marina basin. **Figure 2.16** displays a conceptual illustration of the breakwater design incorporating the use of sediment filled geotextile tubes; and/or
- provide the material required for marine facility land reclamation. This material will provide the majority of the reclamation requirement.





Figure 2.16 CONCEPTUAL ILLUSTRATION OF WESTERN BREAKWATER CROSS SECTION UTILISING GEOTEXTILE CONTAINERS



Source: 'Marina And Vessel Management Aspects' (2011) – International Marina Consultants

Beneficial re-use of all of the marina dredge material will eliminate the need for sea dumping. Furthermore, it will reduce the need for a quarry on the Island and will significantly reduce the amount of rock which will need to be transported to the Island to construct the marina.

Geotextile containers are robust and designed to be filled with sand, soil, gravel, recycled material, treated materials or a combination of the above such that they form a stable, durable container.

Geotextile containers have been used extensively throughout Australia for marine applications including the following locations:

- Belongil Spit, Pelican Point Protection, Stockton Surf Club and Towra Lagoon Protection, in New South Wales;
- Agnes Water Beach Stairs, Airlie Island Protection, Kirra Beach Groynes, Maroochydore Seawall, Maroochydore Beach Groyne, Russell Heads, Southport Broadwater Parklands, Narrowneck Reef and Elliot Heads in Queensland;
- Aspendale Foreshore Protection, Clifton Springs Breakwater, Lakes Entrance Groynes, Limeburners Breakwater, Lake Mulwala and Portsea Beach- Stage 2 in Victoria;
- Milang Foreshore Enhancement, South Australia; and
- Busselton Foreshore, Western Australia.

The geotextile tubes have a design life span of greater than 100 years.



(b) GKI Research and Historic Centre

The GKI Revitalisation Plan will seek to make a positive impact on the understanding and conservation of the fringing coral communities and marine ecology surrounding the Island. This objective will be initiated by establishing the GKI Research and Historic Centre within the Marine Services Precinct and the establishment of programs with various research and education groups. The Research Centre will be used to conduct research programs and conservation activities on the Island and within the Marine Park; monitor fringing coral communities and facilitate student research activities.

Students from local schools and universities will have access to the facility to advance their learning through practical application. The Research Centre will be available for scientists, government departments and other interested parties to conduct research in the Keppels. The design of the Centre will be developed with CQUniversity and interested conservation groups.