

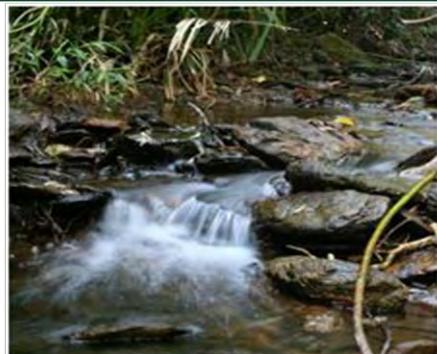


## **6.5 d Beach Access Survey Report Ella Bay**

# Ella Bay Integrated Resort Proposal

## SEIS Submission Response

### Beach Access Report



# Contents

- 1 Introduction ..... 1
- 2 Coastal Vegetation Overview ..... 3
- 3 Beach Access Path Descriptions ..... 5
- 4 Construction Strategies..... 18
- 5 References..... 19
- 6 APPENDICES ..... 20

# 1 Introduction

This report identifies the proposed locations, and concept design for beach access tracks for the Ella Bay Development plan. The focus of the beach access tracks is for minimal disturbance to flora and fauna, to showcase the coastal vegetation and improve the existing coastal vegetation and beachfront coastline. The beach access tracks have been chosen predominately in areas of extensive weed infestation.

A ground survey during March 2010 along the Ella Bay beachfront and coastal vegetation identified the beach access points considering current locations of weeds, important flora species, locations of interest and development requirements. In a number of locations beach access points were chosen specifically due to the high concentration of weeds which will be removed and replaced with natives as part of the revegetation program.

The beach access points will be designed:

- Not to create a barrier restricting the North-South movements of the cassowaries or other fauna throughout the coastal area.
- No clearing of significant native trees and land modifications will occur.

There are six (6) surveyed locations for beach accesses. The access walks have been classified based on the "Track Classification System" by WTMA (2001). The six (6) beach access paths are illustrated in the figure 1.1.

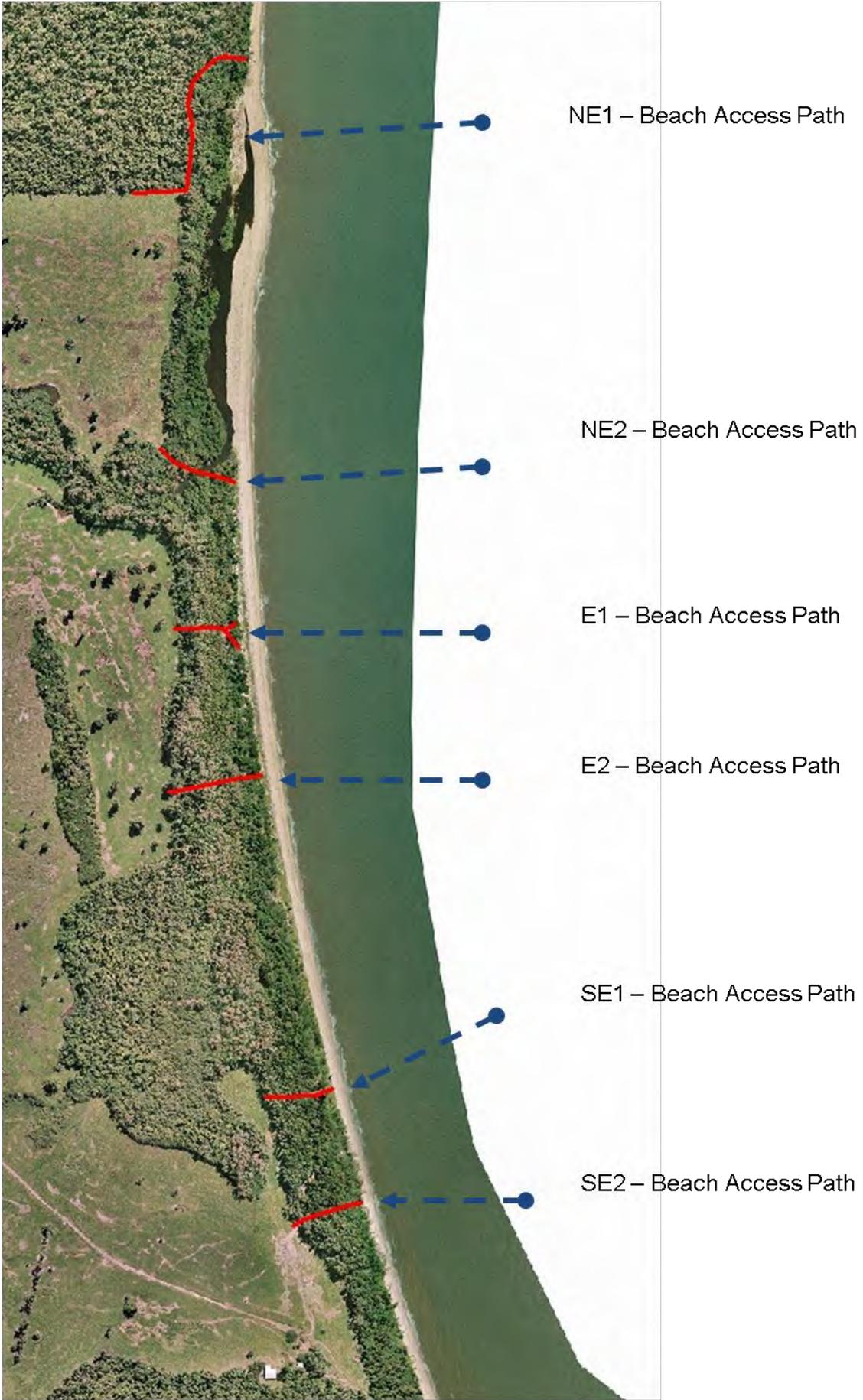


Figure 1.1 Beach Access Locations

## 2 Coastal Vegetation Overview

The existing coastal vegetation communities along Ella Bay are significantly degraded and subjected to high levels of weed invasion from previous farming practices, and seed dispersal through wind, sea, and animal transportation. The main weeds infestations identified at Ella Bay's **coastal region** are Pond Apple and Singapore Daisy. In January 2010 Ella Bay environmental staff conducted an extensive property weeds survey and the results are displayed in figure 2.1. (refer to Submission Response Volume 6.2 Weed Mapping Survey Jan 2010.

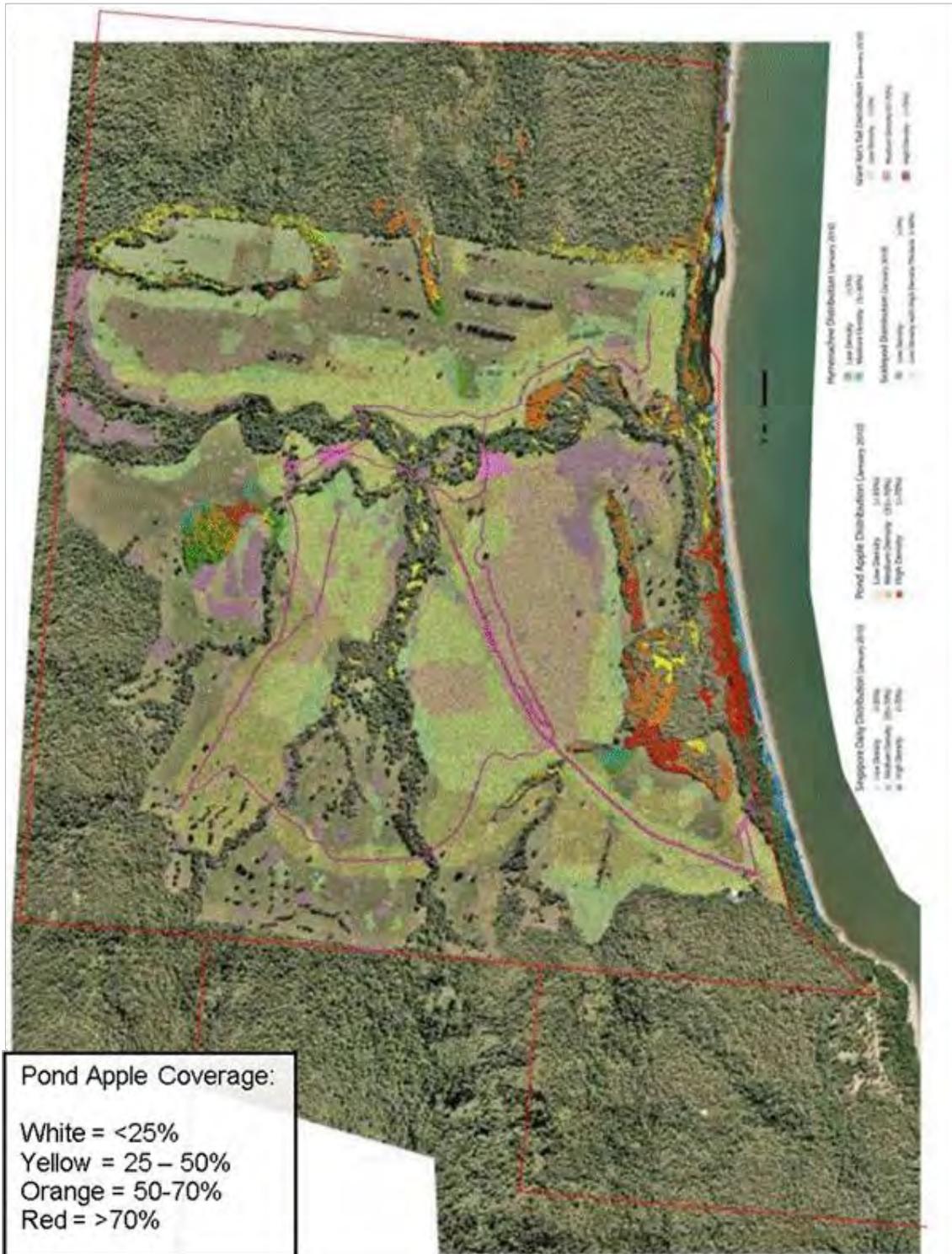


Figure 2.1 Weed Infestation mapping Jan 2010.

Pond Apple, is a declared Weed of National Significance (WONS) *Annona glabra* which has formed dense stands throughout this area with native habitat loss occurring through the suppression and replacement of native plant species. The survey determined the location and density of the Pond Apple within this area. The criteria identifies the lower canopy densities in the following categories: less than 35% (yellow); 35>70% (orange) and >70% (red).

Pond Apple invasion is also a key threatening process to Endangered, Vulnerable or Rare plants found within this area (WONS 2000), such as the „Littoral Rainforest and Coastal Vine Thicket“. This vegetation community is listed as critically endangered under the *Environmental Protection and Biodiversity Conservation Act 1999*. The area is extensively infested with Pond Apple with lower canopy cover greater than 50%, however the upper canopy is dominated by *Melaleuca* *Luecadendra* and *M. quinquenervia*. Refer to (*Pond Apple Assessment 3D. 2010*)

Additionally *Urochloa maxima* (Guinea Grass) and *Allamanda cathartica* (Allamanda) pose a threat to trees located on the western edge of the coastal vegetation; and large swathes of *Sphagneticola trilobata* (Singapore Daisy) are found on the beachfront. The survey determined the location and density of Singapore Daisy within this area. Where the criteria identified the densities in the following categories: less than 35% (light blue); 35>70% (blue) and >70% (dark blue).



Figure 2.2 Singapore Daisy on Ella Bay Beach



Figure 2.3 Pond Apple Infestation in Dunal Swale

### 3 Beach Access Path Descriptions

#### North Eastern Beach Access 1 – NE1

Track name	NE1
DESCRIPTION	The NE1 Beach Access will connect the upper most North East point of the proposed Ella Bay Development to Ella Bay beach via a scenic north-east hard surface and elevated boardwalk route. This beach access path will showcase unique Wet Tropics characteristics comprising of beachfront wetlands swale, mangrove and tropical rainforest vegetation and water crossings. Ella Bay has carefully chosen this path location in between where currently exists a low to medium density population of pond apple weeds on the western side and medium to large density of Singapore daisy weeds on the eastern beach side. Therefore making sure no native trees or mangroves will be destroyed and the location will be carefully revegetated with native trees. The initial 20% approx of the path will be via the proposed revegetation coastal buffer location which is currently open grass pasture.
Track classification and service standards	Pathway 1
Track formation & surface	Hardened surface 40% and boardwalk 60% approx. Suitable for all visitor access including wheelchair.
Track width (approx)	2500 – 2000 mm
Gradient/steps	Flat – no steps. Subtle ramps used to change elevation if required.
Signs	Extensive signage. Information, warning and educational.
Infrastructure	Railing on elevation changes and over water courses. Some seats provided on start and mid point of track. Possible lookout at mid point of path. Toilet and amenities at start of path (west point).
Campsites	N/a
Vegetation clearing	No significant species or individual to be cleared. Weeds will be cleared around path and surrounding area. Pathway will meander around vegetation and made to fit. Minor pruning current vegetation may be required. Revegetation will be performed around path and surrounding area.
Desired monitoring frequency	Constant daily monitoring.
Safety and risk management	Safety and security standards to suit all members of the public.
Maintenance style	Daily maintenance and light maintenance vehicles able to access via path.
Biophysical (natural) setting	Natural setting of area is to be kept to maximum. Toilets and amenities close on start of pathway.
Social setting	Due to only two beach access points in the NE area, visitors can expect frequent encounters with others.
Managerial setting	High and constant managerial presence, monitoring and maintenance. Very well signposted and prompted.
Distance	400 metres approx
Distance Time	10 minutes approx

GPS Start	-17.4517 / 146.0625
GPS Finish	-17.4450 / 146.0640
Length (m)	400
Max Width (mm)	2500
Min Width (mm)	2000
Terrain/surface	Flat terrain. Initial part of path is sandy soil. Within vegetation the soil is sandy damp humus and swampy during the wet season.
Flora	Weeds: Pond apple, singapore daisy Native: Cotton wood, mangrove, red beech, melaluca, acacias, Alexandria palms, swamp pandana, native gardenia, broadleaf lilli pilly, beach pandanas, beach casuarinas.
Fauna	Cassowaries have been spotted and recorded in this area. Wallabies on dry open vegetation areas. Crocodile habitat within swamp and dunal swale water.

**Figure 3.1 North Eastern Beach Access 1 – NE1**



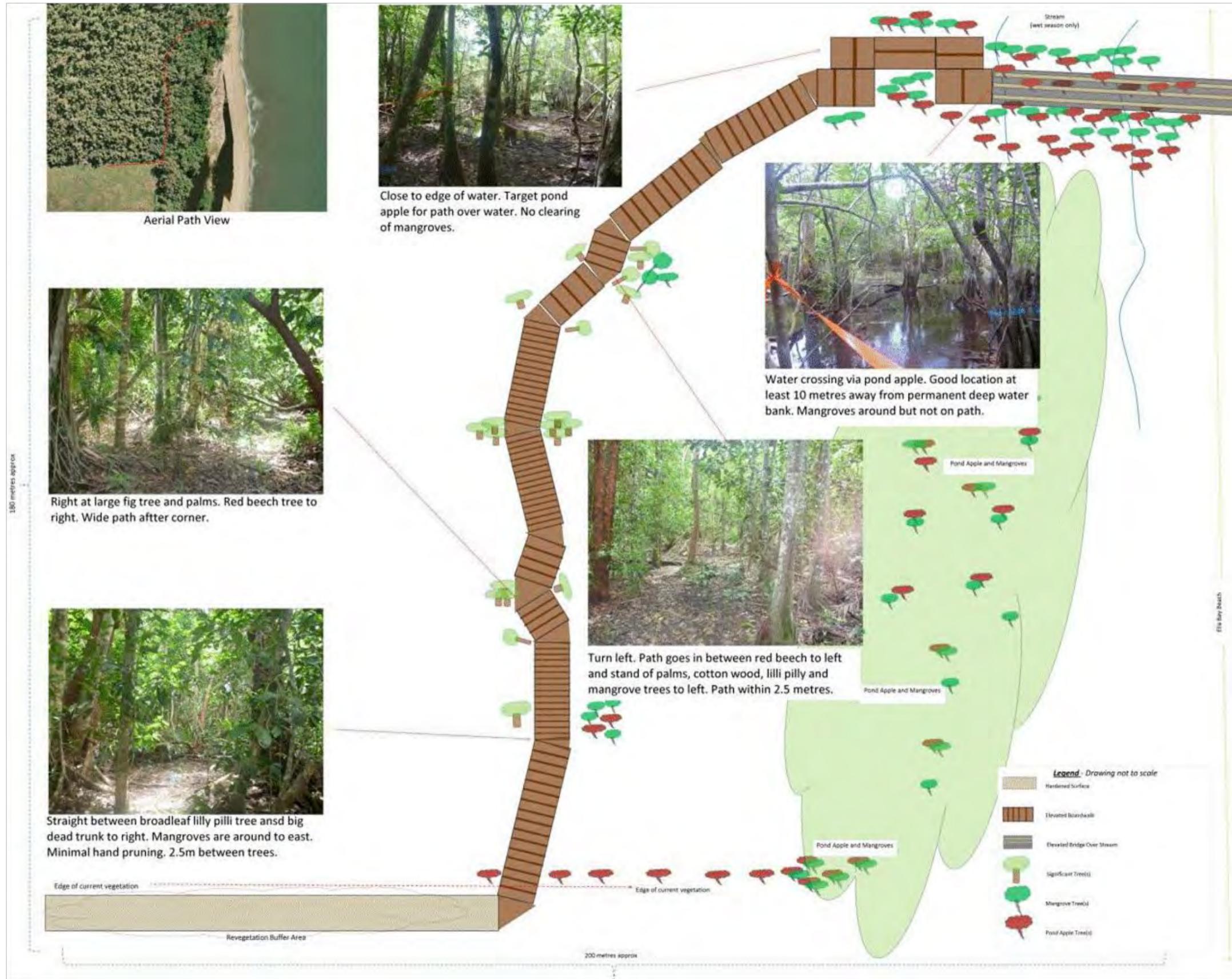


Figure 3.2 Schematic of hard stand and timber walking path. North Eastern Beach Access 1

## North Eastern Beach Access 2 – NE2

Track name	NE2
DESCRIPTION	The NE 2 Beach Access will connect access from the Northern Precinct of Ella Bay development through the coastal revegetation buffer over the beachfront wetlands swale to Ella Bay beach via a combination of hardened surface, elevated boardwalk over swampy areas and elevated bridge over the main creek. The path has been chosen in an area with minimum disturbance to the current environment. This path will be via the proposed revegetated area buffer, in between a medium density population of pond apple which will be revegetated with native trees and bridge over the creek which will be designed to conform to wet and dry season conditions. There is the presence of mangroves around this path area especially near creek banks; however the path will be designed and constructed around established mangrove trees with minimal disruption to the vegetation. This pathway access point is very important as it will act as prevention to uncontrolled access via other locations for the area especially the constantly moving dunal swale.
Track classification and service standards	Pathway 1
Track formation & surface	Hardened surface 25%, boardwalk 65% and elevated bridge structure 10% approx. Suitable for all visitor access including wheelchair.
Track width (approx)	2500 – 1750 mm
Gradient/steps	Pathway: Flat – no steps. Subtle ramps used to change elevation. Bridge: Subtle to slight elevation and descent over water.
Signs	Extensive signage. Information, warning and educational.
Infrastructure	Railing on elevation changes and over water courses. Railing and protection over bridge structure. Some seats provided on start of track. Possible lookout at mid point at bridge. Toilet and amenities at start of path (west point).
Campsites	N/a
Vegetation clearing	No significant species or individual to be cleared. Weeds will be cleared around path and surrounding area. Pathway will be made to fit and go around vegetation. Hand pruning only of current vegetation will be required. Revegetation will be performed around path and surrounding area.
Desired monitoring frequency	Constant daily monitoring.
Safety and risk management	Safety and security standards to suit all members of the public.
Maintenance style	Daily maintenance and maintenance vehicles able to access via path.
Biophysical (natural) setting	Natural setting of area is to be kept to maximum. Toilets and amenities close on start of pathway.
Social setting	Due to only two beach access points in the NE area, visitors can expect frequent encounters with others.
Managerial setting	High and constant managerial presence, monitoring and maintenance. Very well signposted and prompted.
Distance	200 metres approx
Distance Time	10 minutes approx

GPS Start	-17.45510 / 146.06283
GPS Finish	-17.4557 / 146.0639
Length (m)	200
Max Width (mm)	2500
Min Width (mm)	1750
Terrain/surface	Flat. Initial part of path is sandy soil. Within vegetation the soil is swampy and damp especially during the wet season.
Flora	Weeds: Pond apple, singapore daisy. Native: Paperbark, native gardenias, mangroves, cotton wood, beach pandanas, Davidson's plum, acacias, elkhon ferns, beach pines.
Fauna	Wallabies on dry open vegetation areas. Crocodile habitat within swamp and creek water.



**Figure 3,3 North Eastern Beach Access 2 – NE2**

## Eastern Beach Access 1 – E1

Track name	E1
DESCRIPTION	The E1 Beach Access will connect the pedestrian access from the eastern development site to the beach via boardwalk which will be elevated over the dunal swamp swale system. This location has been chosen along a thick stand of pond apple. The pond apple will be felled and the path constructed after its removal. There will be no damage to any native mangrove trees or other significant species. This path, although short will be within a picturesque rainforest wetland location as it meets the beach front. This path will be important to stop unauthorised visitor movement into other areas within the swale.
Track classification and service standards	Pathway 1
Track formation & surface	Hardened surface 20%, boardwalk 65% and sandy surface 15% approx. Suitable all access including wheelchair. Wheelchair access to edge of sandy surface, but may consider timber board options at sand.
Track width (approx)	2500 – 2000 mm
Gradient/steps	Flat – no steps. Subtle ramps used to change elevation.
Signs	Extensive signage. Information, warning and educational.
Infrastructure	Railing on elevation changes and over water courses. Protection over water course structure. Some seats provided on start and end point of track. Toilet and amenities at start of path (west point).
Campsites	N/a
Vegetation clearing	No significant species or individual to be cleared. Weeds will be cleared around path and surrounding area. Pathway will be made to fit and go around vegetation. Hand pruning only of current vegetation will be required. Revegetation will be performed around path and surrounding area.
Desired monitoring frequency	Constant daily monitoring.
Safety and risk management	Safety and security standards to suit all members of the public.
Maintenance style	Daily maintenance and light maintenance vehicles able to access via path.
Biophysical (natural) setting	Natural setting of area is to be kept to maximum. Toilets and amenities close on start of pathway.
Social setting	Due to only two beach access points in the E area, visitors can expect frequent encounters with others.
Managerial setting	High and constant managerial presence, monitoring and maintenance. Very well signposted and prompted.
Distance	150 metres approx
Distance Time	5 minutes approx

GPS Start	-17.45745 / 146.06303
GPS Finish	-17.45770 / 146.06390
Length (m)	150
Max Width (mm)	2500
Min Width (mm)	1750
Terrain/surface	Flat. Path is over the dunal swale which fills during the wet season. Closer to beach soil is sandy over a dune.
Flora	Weeds: Pond apple, Singapore daisy. Native: Mangroves, paperbark, red beech.
Fauna	Crocodile habitat within swamp and dunal water area. Wallabies occasionally spotted in this area. Beach stone curlew occasionally spotted in this area.

**Figure 3.4 Eastern Beach Access 1 – E1**



## Eastern Beach Access 2 – E2

Track name	E2
DESCRIPTION	Similar to the E1 Beach Access, E2 Beach Access will connect the pedestrian access from the Central Resort site to the beach via a boardwalk which is elevated over the dunal swale. The location of E1 and E2 have been chosen to be one third and two thirds along the central area to distribute pedestrian traffic to minimise disturbance. This beach access also has large stands of pond apple along the route. The pond apple will be felled and the path constructed after its removal. There will be no damage to any native mangrove trees or other significant species. This path, although short will be within a picturesque rainforest wetland location as it meets the beach front.
Track classification and service standards	Pathway 1
Track formation & surface	Hardened surface 20%, boardwalk 70% and sandy surface 10% approx. Suitable all access including wheelchair. Wheelchair access to edge of sandy surface, but may consider timber board options at sand.
Track width (approx)	2500 – 1750 mm
Gradient/steps	Flat – no steps. Subtle ramps used to change elevation.
Signs	Extensive signage. Information, warning and educational.
Infrastructure	Railing on elevation changes and over water courses. Protection over water course structure. Some seats provided on start and end point of track. Toilet and amenities at start of path (west point).
Campsites	N/a
Vegetation clearing	No significant species or individual to be cleared. Weeds will be cleared around path and surrounding area. Pathway will be made to fit and go around vegetation. Hand pruning only of current vegetation will be required. Revegetation will be performed around path and surrounding area.
Desired monitoring frequency	Constant daily monitoring.
Safety and risk management	Safety and security standards to suit all members of the public.
Maintenance style	Daily maintenance and maintenance vehicles able to access via path.
Biophysical (natural) setting	Natural setting of area is to be kept to maximum. Toilets and amenities close on start of pathway.
Social setting	Due to only two beach access points in the E area, visitors can expect frequent encounters with others. Pathways could be used for bicycles.
Managerial setting	High and constant managerial presence, monitoring and maintenance. Very well signposted and prompted.
Distance	170 metres approx
Distance Time	5 minutes approx

GPS Start	-17.4597 146.0629
GPS Finish	-17.4595 146.0643
Length (m)	170
Max Width (mm)	2500
Min Width (mm)	1750
Terrain/surface	Flat. Path is over the dunal swale which fills during the wet season. Closer to beach soil is sandy over a dune.
Flora	Weeds: Pond apple, Singapore daisy. Native: Mangroves, paperbark, red beech.
Fauna	Crocodile habitat within swamp and dunal water area. Wallabies occasionally spotted in this area. Beach stone curlew occasionally spotted in this area.



**Figure 3.5 Eastern Beach Access 2 – E2**

## South Eastern Beach Access 1 – SE1

Track name	SE1
DESCRIPTION	The SE1 beach access has been chosen along an existing cleared path to the beach. No clearing of significant trees or species will be required. The path will be hard stand with no elevated structures. It is expected that there will be a low number of visitors accessing this path and will cause minimal impact to the environment.
Track classification and service standards	Pathway 2
Track formation & surface	Hardened surface 75% and sandy surface 25% approx. Suitable all access including wheelchair. Wheelchair access to edge of sandy surface.
Track width (approx)	2000 - 1750mm
Gradient/steps	Flat – no steps. Subtle ramps used to change elevation if required.
Signs	Some signage. Information, warning and educational.
Infrastructure	Some seats provided on start and end point of track.
Campsites	N/a
Vegetation clearing	Current old path. No significant species or individual to be cleared. Weeds will be cleared around path and surrounding area. Pathway will be made to fit and go around vegetation. Hand pruning only of current vegetation if required. Revegetation will be performed around path and surrounding area.
Desired monitoring frequency	Regularly inspections.
Safety and risk management	Safety and security standards to suit all members of the public.
Maintenance style	Maintenance by foot and small vehicle when required.
Biophysical (natural) setting	Natural setting of area is to be kept to maximum.
Social setting	This access point is target for use by the spa visitors. Users can expect low contact with other users.
Managerial setting	Appropriate monitoring and management. Some signage.
Distance	125 metres approx
Distance Time	5 minutes approx

GPS Start	-17.4638 / 146.0642
GPS Finish	-17.4637 / 146.0652
Length (m)	125
Max Width (mm)	2000
Min Width (mm)	1750
Terrain/surface	Flat. Minimal elevation change at beach front. Soil is sandy covered with humus material but dry.
Flora	Weeds: Singapore daisy. Native: Wattles, white apples, native olives, fig, beach calophyllum and sarsaparilla trees.
Fauna	Some animals recorded in this area are: Beach Stone Curlew, Fig Parrots, and Coastal Bat. Cassowary evidence has been recorded on occasions at this area.

**Figure 3.6 South Eastern Beach Access 1 – SE1**



## South Eastern Beach Access 2 – SE2

Track name	SE2
DESCRIPTION	The SE2 Beach Access path will be the main access point for visitors and public. It will include access for emergency vehicle to the beach front. There is an existing wide cleared path to the beach area via an old fisherman's hut. The fisherman's hut and amenities will be removed and the area rehabilitated and revegetated. The path will be constructed within the existing cleared area in a more direct line to the beach. The canopy is open and trees are spaced apart. Some hand clearing will be required but no major species or significant species will be cleared.
Track classification and service standards	Pathway 1
Track formation & surface	Hardened surface, Suitable all access including wheelchair and emergency vehicles.
Track width (approx)	2500 mm
Gradient/steps	Flat – no steps.
Signs	Extensive signage. Information, warning and educational.
Infrastructure	Railing on arrival at beach. Some seats provided along of track. Toilet and amenities at start of path (west point).
Campsites	N/a
Vegetation clearing	Some hand clearing required. No significant species or individual to be cleared. Weeds will be cleared around path and surrounding area. Pathway will be made to fit and go around vegetation. Hand pruning only of current vegetation will be required. Revegetation will be performed around path and surrounding area.
Desired monitoring frequency	Constant daily monitoring.
Safety and risk management	Safety and security standards to suit all members of the public.
Maintenance style	Daily maintenance and maintenance vehicles able to access via path.
Biophysical (natural) setting	Natural setting of area is to be kept as much as possible. Toilets and amenities close on start of pathway.
Social setting	Due to this being the main beach access location, visitors can expect frequent encounters with others. Pathways could be used for bicycles, emergency vehicles.
Managerial setting	High and constant managerial presence, monitoring and maintenance. Very well signposted and prompted.
Distance	150 metres approx
Distance Time	5 minutes approx

GPS Start	-17.4655 / 146.0646
GPS Finish	-17.4652 / 146.0656
Length (m)	150
Max Width (mm)	2500
Min Width (mm)	2000
Terrain/surface	Flat with a dry depression present near the beach front. Dry sandy surface covered with foliage material.
Flora	Weeds: Singapore daisy at the beach front. Native: Wattles, white apples, native olives, fig, beach calophyllum, sarsaparilla and native gardenias trees. There are no mangroves present at this area.
Fauna	Some animals recorded in this area are: Beach Stone Curlew, and Fig Parrotst. Cassowary evidence has been recorded on occasions at this area.



**Figure 3.7 South Eastern Beach Access 2 – SE2**

## 4 Construction Strategies

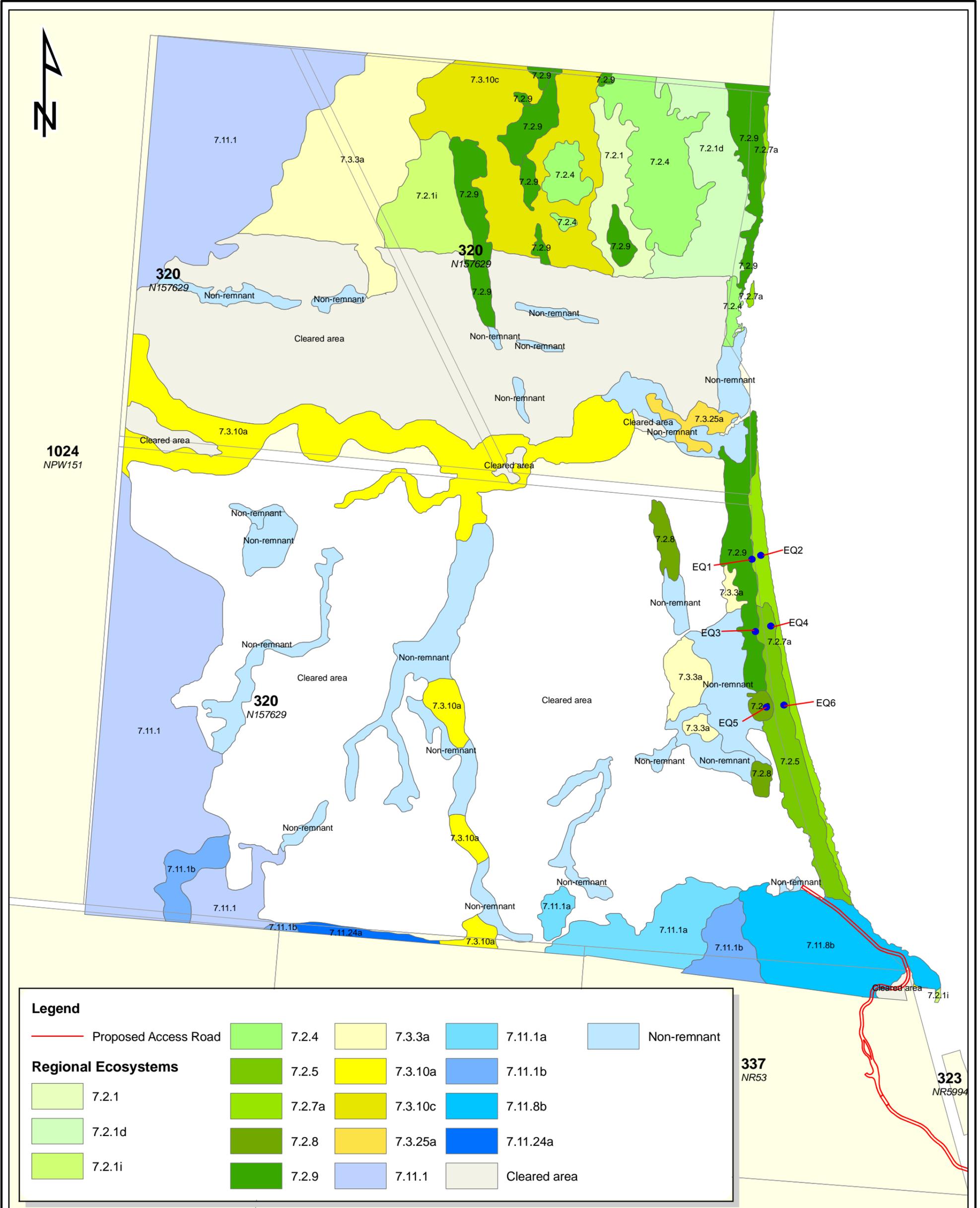
During this conceptual and design process Ella Bay will base its design ideas and construction on research into current construction and materials best practices and into future new eco-friendly technology to meet or exceed the appropriate Australian standard (AS 2156.1). Ella Bay also commits itself in performing research into other similar beach access points already in place to learn and develop innovative environment friendly designs, technology and management procedures.

## 5 References

- WONS (2000). *Weeds of National Significance Pond Apple (Annona glabra) Strategic Plan*. National Weeds Strategy Executive Committee, Launceston.
- WTMA (2001). *Wet Tropics Walking Strategies*. Wet Tropics Management Authority. Cairns
- Arias (2007). *Overview of Existing Walking Trail Classification Systems*. Department and Sustainability and Environment. Victoria

## 6 APPENDICES

Appendix 1. . JY[Yh]cb'Survey'9l hfUMg



**Legend**

	Proposed Access Road		7.2.4		7.3.3a		7.11.1a		Non-remnant
<b>Regional Ecosystems</b>			7.2.5		7.3.10a		7.11.1b		7.11.8b
	7.2.1		7.2.7a		7.3.10c		7.11.24a		7.11.1
	7.2.1d		7.2.8		7.3.25a		Cleared area		
	7.2.1i		7.2.9		7.11.1				

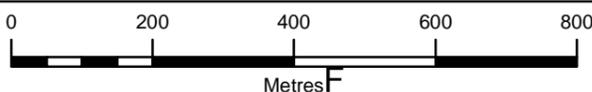
**NOTES:**

(i) This plan has been produced for exclusive use of the client and 3D Environmental  
 DIGITAL CADASTRAL DATA BASE  
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**Figure 1. Site Survey Locations (11.02.2010)  
 - Regional Ecosystems**

Client

**Satori Resorts**



Scale 1:10,000

Drawn By DG

Checked DS

File Path

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Date

13/02/09

A3

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## Dune Swale Vegetation Sites

<b>Site Number AQ1:</b> Open Swamp Forest		
<b>Canopy Height Range:</b> 23-28m , <b>Sub-Canopy Height Range;</b> 8 -12m, <b>Canopy Cover:</b> 50% <b>Sub-canopy cover:</b> 60%		
<b>Landform:</b> inundated dune swale <b>GPS Location:</b> -17.4585, 146.0636		
Species	Basal Area: Canopy	Basal Area: Sub-Canopy
<i>Annona glabra</i> (pond apple)	0	2
<i>Melaleuca leucadendra</i> (weeping tea tree).	14	0
<i>Brugiera sp.</i> ( mangrove)	0	14
		

<b>Site Number AQ3:</b> Open Swamp Forest		
<b>Canopy Height Range:</b> 23-28m , <b>Sub-Canopy Height Range;</b> 10 -18m, <b>Canopy Cover:</b> 40% <b>Sub-canopy cover:</b> 60%		
<b>Landform:</b> inundated dune swale <b>GPS Location:</b> -17.4606, 146.0639		
Species	Basal Area: Canopy	Basal Area: Sub-Canopy
<i>Annona glabra</i> (pond apple)	0	32
<i>Melaleuca leucadendra</i> (weeping tea tree).	12	0
<i>Brugiera sp.</i> ( mangrove)	0	4



**Site Number EQ5:** Open Swamp Forest.

**Canopy Height Range:** 18 - 238m , **Sub-Canopy Height Range;** 8-15m, **Canopy Cover:** 40%  
**Sub-canopy cover:** 50%

**Landform:** inundated dune swale **GPS Location:** -17.4629 N 146.0641

Species	Basal Area: Canopy	Basal Area: Sub-Canopy
<i>Annona glabra</i> (pond apple)	0	23
<i>Melaleuca leucadendra</i> (weeping tea tree).	10	0
<i>Atractocarpus fitzalanii</i> (brown gardenia)	0	1



## Beach Ridge Vegetation Sites

**Site Number EQ2:** Low open forest.

**Canopy Height Range:** 6 - 10m **Canopy Cover:** 40%

**Shrub layer:** 3 - 8m

**Landform:** Beach Ridge **GPS Location:** -17.4584 N 146.0639

Species	Basal Area: Canopy	Basal Area: Sub-Canopy
<i>Acacia crassicarpa</i>	1	No records
<i>Calophyllum australianum</i> (beach calophyllum)	1	-
<i>Terminalia arenicola</i> (beach almond)	2	-
<i>Morinda citrifolia</i>	4	-
<i>Syzygium forte</i> subsp. <i>forte</i>	1	-
<i>Chionanthus ramiflora</i> (native olive)	3	-
<i>Alstonia scholaris</i> (milky pine)	1	-



**Site Number EQ4:** Low open forest.

**Canopy Height Range:** 6 - 12m **Canopy Cover:** 40%

**Shrub layer:** 3 - 8m

**Landform:** Beach Ridge **GPS Location:** -17.4605, 146.0642

Species	Basal Area: Canopy	Basal Area: Sub-
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		Canopy
<i>Acacia crassicarpa</i>	1	No records
<i>Calophyllum australianum</i> (beach calophyllum)	1	-
<i>Chionanthus ramiflora</i> (native olive)	2	-
<i>Annona glabra</i> (pond apple)	2	-
<i>Euroschinus falcatus</i>	2	-
<i>Dillenia alata</i>	2	-
<i>Pittosporum ferrugineum</i>	1	-
<i>Millettia pinnata</i>	1	-
<i>Melaleuca leucadendra</i>	1	-
<i>Polyscias elegans</i>	1	-
<i>Dillenia allata</i>	2	-



<b>Site Number EQ6:</b> Notopyll vine forest (disturbed)		
<b>Canopy Height Range:</b> 18 - 28m <b>Canopy Cover:</b> 60%		
<b>Shrub layer:</b> 3 – 8m		
<b>Landform:</b> Beach Ridge <b>GPS Location:</b> -17.4631, 146.0647		
Species	Basal Area: Canopy	Basal Area: Sub-Canopy
<i>Acacia crassicarpa</i>	1	No records
<i>Calophyllum australianum</i> (beach calophyllum)	8	-
<i>Chionanthus ramiflora</i> (native olive)	1	-
<i>Euroschinus falcatus</i>	5	-
<i>Ficus racemosa</i>	1	-
<i>Alstonia scholaris</i>	1	-

<i>Melaleuca leucadendra</i> (weeping tea tree)	1	-
<i>Carallia brachiata</i> (freshwater mangrove)	2	-
<i>Syzygium forte</i> subsp. <i>forte</i> .	1	-
<i>Cocos nucifera</i> *.	1	-

