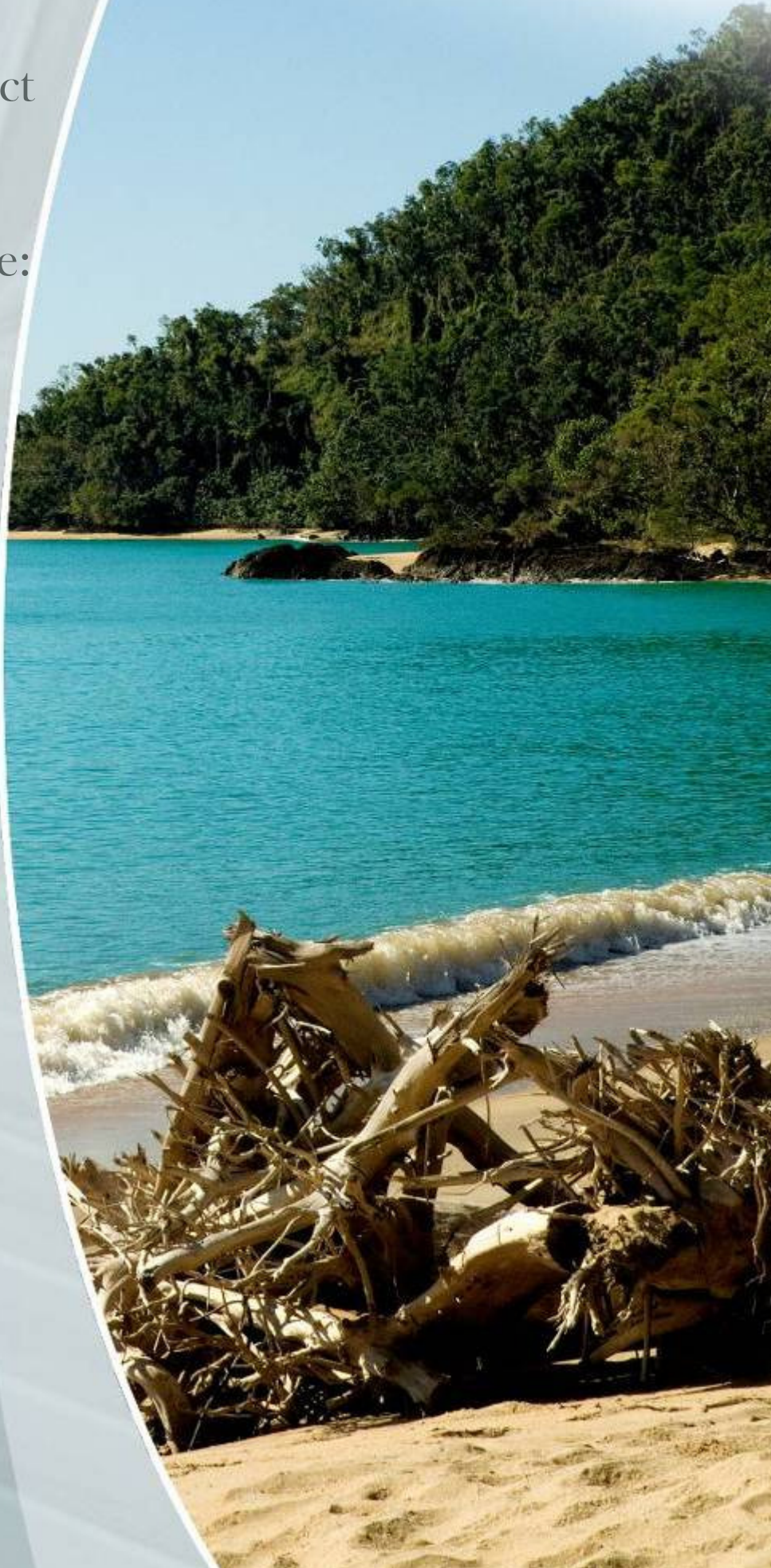


Ella Bay Integrated Resort Proposal



Supplementary Environmental Impact Statement

Submission Response: 1.2 Flora and Fauna



1.2 Flora and Fauna

1.2.1 Introduction

The Flora and Fauna response has been developed in consideration of the overall objectives and philosophy of the Ella Bay Integrated Resort Proposal as set out in the EIS Executive Summary.

In further refining our flora and fauna impact mitigation strategies, the concerns of all the submitters and key stakeholders were taken into consideration.

Specific submission concerns have been collated into the following key areas for this section:

- *Flora and Fauna Monitoring,*
- *Species Concerns,*
- *Habitat and Wildlife Corridors,*
- *Marine Environments,*
- *Vegetation Clearing,*
- *Vegetation,*
- *Weed Management,*
- *Barriers, Buffers and Setbacks, and*
- *Additional Issues.*

In response to a number of submissions relating to the Ella Bay natural ecosystem including flora, fauna and habitat, Biodiversity Assessment and Management Pty Ltd (BAAM), a specialist ecologist consultant with expert knowledge of vegetation communities and species, terrestrial and aquatic vertebrate and invertebrate fauna species and habitats, were engaged to develop a detailed response. The full report is provided in Volume 4, Appendix A.2.3 and should be read in conjunction with this section.

In addition, a draft *Integrated Package of Regulated Offsets and Additional Environmental Investments* for the Ella Bay Integrated Resort is under negotiation with government agencies and specialist ecosystem services offset broker Degree Celsius and Terrain Natural Resource Management. Further details are provided in Volume 2, Section 2.7.3 and should be read in conjunction with this section.

1.2.2 Submitter Issue: Flora and Fauna Monitoring

1.2.2.1 Amphibian Surveying

The surveying for amphibian species conducted during the dry season produced predictably low recording rates. Despite this the survey produced records of two significant species of amphibians. Specialist wet season surveys should be conducted to evaluate the importance of threatened frog sites and determine potential threats.

EIS reference: Volume 4, Section 4.7.1.2

Submitter reference: 1/52

Wet Tropics Management Authority (50)

Proponent response

The field survey (BAAM) was undertaken in October 2006 during warm conditions, following a long period of high rainfall, and was considered by the field ecologist as representing good conditions for the detection of frog species. Therefore further studies are considered unnecessary at this stage of the planning process and are unlikely to increase the number or distribution of species recorded.

Two frog species of conservation significance were detected outside and above the Development Zone during the survey. These were:

- Inelegant Frog, *Cophixalus infacetus*
Status: Rare Nature Conservation Act, 1992 (NCA), Not Listed Environmental Protection and Biodiversity Conservation Act, 1999 (EPBC).
- The Common Mist Frog, *Litoria rheocola*
Status: Endangered NCA, Endangered EPBC.

In addition, the 'Endangered' (NCA and EPBC) Australian Lacelid, *Nyctimystes dayi*, was considered to have the potential to be present, based on its ecological requirements, which are similar to those of the Creek Frog.

Cophixalus infacetus is a small rainforest frog restricted to the wet tropics between Cairns and Ingham (Barker et. al. 1995). The species does not require water to breed, and eggs are laid in damp areas beneath logs, litter, etc. with frogs emerging fully formed. This species was not found on the subject site during the fauna surveys, although the presence of suitable habitat and local records suggest that the species is highly likely to occur. Suitable habitat occurs anywhere within the development site and road alignment options where rainforest and mesic vegetation occur. Impacts of development are likely to be related to habitat loss and fragmentation, altered fire regimes and road mortality. Many of these potential impacts will be mitigated or eliminated with extensive rehabilitation and improvements to existing degraded and fragmented habitat.

Litoria rheocola was located within streams where riffle zones occur on the southern boundary of the subject site, upstream and outside of the proposed development area. None were recorded along similar streams within the development area, which may be due to surrounding land use (e.g. grazing) affecting water quality. The species is also expected in other similar stream bodies to the west of the development site, and within streams crossing the potential road alignment options.

Within its distribution the species has been located in streams from around sea level to approximately 1200 metres. However, the species has significantly declined from locations above 300 metres (Ingram and McDonalds 1993, Hodgkinson and Hero 2003) but has persisted on lowland areas (McDonald and Alford 1999). Lowland populations appear to be stable, but the long-term survival of the species is now heavily dependant on its persistence in such locations. Consequently, populations associated with the Seymour Range and the project site may be of local and regional significance.

Nyctimystes dayi may occur in all locations where *L. rheocola* has been located, in rainforest streams with riffle zones. Both species occur in lotic streams within mesic vegetation, particularly where riffle zones are present (in the upper stream reaches). They are not likely to occur in lower stretches within the development area where large pooling water bodies occur. Similar to *L. rheocola*, surrounding land use may restrict distribution of *Nyctimystes dayi*. Habitat protection and impact mitigation measures adopted for *L. rheocola* would also protect the habitat of *Nyctimystes dayi*.

Loss of habitat of *L. rheocola* and *Nyctimystes dayi* are expected to be largely restricted to streamlines along the access road. Road widening is likely to require the alteration of streamside vegetation adjacent to the existing road. The loss of this area however, is not likely to be a significant proportion of suitable habitat upstream of the roads and within the Seymour Range. Consequently, impacts are likely to be relatively low in the local context.

The upgrading of the existing Ella Bay road may pass through areas of suitable stream habitat. A potential increase in the number of road mortalities for *L. rheocola* and *N. dayi* relating to increased traffic may occur, having a local impact on these populations. Impacts therefore, are likely to be localised. It is proposed that road crossings over drainage lines will be of a suitable design to allow the safe movement of these frog species, preferably bridging streams and leaving stream banks in tact. Adverse impacts related to water quality are not considered likely, as all development activities are downstream of known and likely populations. Details on bridges that are also proposed to be incorporated are included in the *Access Road Strategy* (Environment North) found in Volume 4, Appendix A.2.6.

Based the behavior and ecological requirements of the frog species, experience of field ecologists, and the review of wildlife database searches, it has been determined that there are no other frog species of conservation significance likely to be present on the subject site. Impact assessment has taken into account the presence or likely presence of the three significant species. Further frog surveys are unlikely to increase the number or distribution of species recorded.

1.2.2.2 Aquatic Fauna Surveying

Fish sampling methodology is considered inadequate. Pre- and post-development fish surveys should be conducted as part of surface and groundwater modeling, and fish/aquatic species sampling should be undertaken to encompass seasonal variations and provide a comprehensive record of fish diversity.

A more appropriate survey technique would involve the use of a backpack electrofisher, in combination with block seine nets. A night-time spotlighting survey is also recommended.

EIS reference: Volume 4, Section 4.7.1.2

Submitter reference: 1/52

Department of Primary Industries and Fisheries. (43)

Proponent response

The impact assessment and recommendations (BAAM, 2007, EIS Appendix A6.2) were aimed at protecting and enhancing the creek habitats and water quality to the greatest extent possible assuming that drainage lines support habitats of significance for all freshwater species.

Consultation with the Curator of Freshwater Fish at the Queensland Museum (who undertook the identifications) has indicated that, for the subject site, the combination of fish traps and dip netting is just as effective given the nature of the environment. Seine nets would not have been suitable given the small size of the drainage lines, the amount of debris present and steepness of the banks. Use of an electrofisher could have been as effective but under the circumstances the techniques used were adequate. Further freshwater fish surveys could be conducted to improve knowledge of species present and their habitat requirements for rehabilitation purposes. The proponent would consider undertaking further aquatic vertebrate data collection and long term monitoring of water health.

1.2.2.3 Marine Flora Habitats Survey

While freshwater aquatic habitats on the development site have been addressed, additional information could be provided on onsite marine flora. The development of a section description of foreshore marine flora should be considered.

EIS reference: Volume 4, Section 4.7.1.2.5

Submitter reference: 1/52

Department of Primary Industries and Fisheries. (43)

Proponent response

The BAAM field survey (2006) indicated that no marine flora was recorded from the study area. In addition, the Golder (2007) *Conceptual Surface Water and Groundwater Hydrology Models* (Volume 4, Appendix A.2.1) indicates that the site is a freshwater system, with only occasional “outbreaks” of the interdunal wetland to Ella Bay during extended wet periods, and occasional breaching of the frontal dune by tidal waters during storm surge. Therefore the vegetation present reflects a predominantly freshwater environment. If during further investigation any marine flora is identified the proponent will seek the appropriate approval.

1.2.2.4 Study of Flora and Fauna of the Ella Bay Wetlands

Additional study of flora and fauna of Ella Bay Wetlands is recommended including the periods throughout the year when the wetland is connected to streams on site, and to what extent these flows are utilised by migrating fish species. The role of the wetland as a fish nursery and habitat for endangered flora and fauna species should also be further considered.

EIS reference: Volume 4, Section 4.7.1.1 & 4.7.1.2

Submitter reference: 21/52

J Dall (6), E Bock (11), B Harvey (C4) (12), R Eastment (13), J Beasley (14), Performa letter (15 submissions) (17, 22-35), Department of Primary Industries and Fisheries (43)

Proponent response

The proponent considers that an additional study of the flora and fauna of the Ella Bay Wetlands is not required at this stage, as the Golder report found that there is no groundwater connection and only minimal surface water flow between the Site and the Ella Bay Wetlands [refer to the *Conceptual Surface Water and Groundwater Hydrology Models* (Golder) – Volume 4, Appendix A.2.1].

A refinement of the Master Plan to mitigate potential water runoff impacts on the wetland has been undertaken. The portion of the development that occurs within the wetland catchment will be altered to three organic golf course fairways, with the majority of the residential component being relocated further south in a different catchment zone. Organic fairways do not use fertilisers or pesticides. Surface water from the fairways can be more easily monitored and managed to achieve the required water quality and quantity guidelines. With the minimal hydrological connectivity of the site and the Ella Bay Wetland and with the proposed mitigation measures, additional studies of biota and the role of the wetland as a fish nursery are not considered to be required at this stage.

As part of their *Consultant Submission Response*, Biodiversity Assessment and Management Pty Ltd made comment in relation to the role of the wetland (Volume 4, Appendix A.2.3). While research into the relationship between the relevant portion of the development site and the wetlands for aquatic species is necessary for planning and monitoring purposes, planning at this stage will ensure the complete protection and enhancement of the subject drainage lines and water quality and quantity leaving the site and entering the wetland.

1.2.2.5 Other Fauna Surveys

Search efforts for aquatic vertebrate species such as turtles and platypus should be discussed and seasonal conditions for fauna and flora surveys should be further considered.

Additional surveys should be made along the road alignment to evaluate the risk of the widening of Ella Bay Road on other wildlife such as the Spotted-tailed Quoll or Red-legged Pademelon.

EIS reference: Volume 4, Section 4.7.1.2

Submitter reference: 2/52

E Bock (11), Wet Tropics Management Authority (50)

Proponent response

Further freshwater fauna surveys could be conducted to improve knowledge of species present and their habitat requirements for rehabilitation purposes. The data collected, preferably over a range of seasons and conditions, would form the basis of a long-term monitoring program for waterway health (refer to the *Water Quality Management Strategy* – THG Volume 4, Appendix A.2.2). In the absence of more detailed information, the recommendations of BAAM (2007) were aimed at protecting and enhancing the creek habitats and water quality to the greatest extent possible assuming that the drainages lines support habitats of significance for all freshwater species. The presence of Platypus is considered unlikely due to habitat conditions.

Specialist studies, reports and strategies have been developed in consideration of the impact on fauna and flora along the road alignment. This includes a *Terrestrial Flora and Fauna Assessment* conducted by BAAM which is incorporated into a wider *Access Road Strategy* (Environmental North) (see Volume 4, Appendix A.2.6). Mitigation measures include water runoff strategies and bridges across creeks. The results of these reports are also discussed in the *Getting to Ella Bay* section of this report (Volume 2, Section 2.1) and the *Road and Transport* submission response (Volume 1, Section 1.4).

1.2.3 Submitter Issue: Species Concerns

1.2.3.1 Beach Stone-Curlew

Ella Bay beach is about 8 km long with proposed resort activities occurring for 2 km. There is no headland or creek to prevent resort patrons from using the full length of beach and may possibly exclude the Beach Stone-Curlew entirely, or at least their breeding opportunities.

EIS reference: Volume 4, Section 4.7.1.2.2

Submitter reference: 1/52

Wet Tropics Management Authority (50)

Proponent response

While a specific study is yet to be undertaken, if considered appropriate a study will be conducted as part of the detailed design and operational works phases. This assessment could be carried out to determine the number and significance of local and regional pairs of the Beach Stone Curlew. The subsequent development of a Management Plan would guide detailed planning of beach access and pedestrian movement. It should be noted that the current design includes limited walking tracks to the beach (see figure 1.2.1).



Figure 1.2.1: Plan indicating limited access points to the beach (Volume 3, Section 3.1)

1.2.3.2 Coastal Fauna Impact

Pilot Whales, Pacific Dolphins and Humpback Whales have been sighted within the region. Dugong feeding on sea grasses, and Turtle and White-bellied Sea-eagle nesting according to sightings in surrounding areas also occurs within Ella Bay. The potential impact on these species should be further considered.

EIS reference: Volume 4, Section 4.7.1.2

Submitter reference: 3/52

J Dall (6), M Hooker (15), C Head & C Belbin (21)

Proponent response

Impact on Marine Fauna

Subject to maintaining and/or mimicking existing hydrology the Golder (2007) *Conceptual Surface Water and Groundwater Hydrology Models* (Volume 4, Appendix A.2.1.) concluded that the development represents a low risk to adjacent wetland swales and ecological systems (Farm Wetland Swale and WTQWHA). Management of the Development Zone to limit changes to surface water and groundwater hydrology within adjacent wetland areas would, by definition, also protect existing surface water and groundwater discharges to Ella Bay and the Reef Lagoon.

With the implementation of water quality management strategies, sediment discharge to creeks and wetlands, adjacent wetlands or the Reef Lagoon is not considered a significant risk to water quality, during or following each stage of construction works. These measures will therefore mitigate impacts on marine habitat and fauna within Ella Bay which may include Pilot Whales, Pacific Dolphins, Humpback Whales, Dugongs and Turtles.

White -bellied Sea-eagle

While no potential White-bellied Sea-eagle nests were observed on site during the time of survey, it is possible that the larger trees present on the site could be used for nesting purposes in the future. None of these larger trees are proposed to be removed for the proposed development, although the species is known to be discouraged from nesting by human activity. Given the available, undisturbed habitat in the local area and additional foreshore revegetation and rehabilitation, the alienation of the development area for White-bellied Sea-eagles will not threaten the long term viability of the species locally, regionally or nationally.

Turtle Nesting

The potential for the beach area for turtle nesting was examined (BAAM, 2006) and found to be less than ideal, although the possibility of occasional turtle nesting in this area was not discounted. A

monitoring program is to be conducted which may contribute to development design at the detailed design phase if necessary.

Sediment Control

Sediment reduction measures to protect coastal ecosystems and the Reef Lagoon from large-scale sediment sources such as agriculture and smaller-scale sources such as coastal developments have been identified and implemented over a whole of government and industry approach within the past ten years (refer to Volume 4, Appendix A.2.1—Section 8). Well designed and maintained roads, resorts, residences and other open space areas within the Development Zone will mitigate most of the existing sediment impact from the Site and provide additional sediment retention capacity through the use of Water Sensitive Urban Design (WSUD) techniques (i.e. constructed swales and sediment/wetlands treatment areas). Post construction this should significantly reduce the overall existing sediment load to creeks, adjacent wetland areas and the Reef Lagoon, having minimal effect on potential marine fauna.

Within the Development Zone it is planned to use WSUD techniques as part of sediment control measures during and following construction through:

- the use of water harvesting and porous paving to reduce run-off from hardstand areas;
- limiting the extent of disturbed areas open at any time;
- managing surface water using WSUD techniques such as constructed swales, sediment/wetlands treatment areas and gross pollutant traps to reduce flow velocities and provide suitable retention times to trap sediment prior to discharge off-site; and
- implanting WSUD techniques that will also maximise the direction of surface water sheet flow into natural buffers to waterways that will be provided by vegetation to be retained and rehabilitated adjacent to gullies, creeks and wetlands.

The primary method of erosion and sediment control during construction will be the preparation and implementation of Erosion and Sediment Control (ESC) Plans for each development area, down to single lot scale, in accordance with the strategies promulgated by the Far North Queensland Regional Organisation of Councils (FNQROC). All ESC Plans will be required to be prepared by appropriately trained and approved personnel in accordance with FNQROC policies as applied by Johnstone Shire Council. This would include review of all ESC Plans as part of each construction works Approval to be provided by Council. Auditing of erosion and sediment control implementation and a comprehensive water quality monitoring program would be required during and following construction.

It should also be noted that the current state of water quality onsite is poor as a result of runoff pollution from onsite cattle and agricultural practices, with waterways found to be containing high levels of nutrients and sediment (refer to figure 1.2.2 below). With the proposed water quality management

techniques the development provides the opportunity to substantially rectify and improve runoff and stream quality and potentially reduce sediment discharge into the Reef Lagoon.

For further details on water management strategies including sediment control refer to *Conceptual Surface Water and Groundwater Hydrology Models* (Golder) (Volume 4, Appendix A.2.1) and *Water Quality Management Strategy* (THG) (Volume 4, Appendix A.2.2) reports.



Figure 1.2.2: Farm Wetland Swales indicating poor water quality and high sediment levels

1.2.4 Submitter Issue: Habitat and Wildlife Corridors

1.2.4.1 Wildlife Corridors

Wildlife corridors should attempt to meet the minimum distance prescribed under the *Regional Vegetation Management Code*, so connectivity can be achieved throughout the site. Delineate the extent by which wildlife corridors are proposed to be widened. Ideally corridors should be at least 100 m in width.

EIS reference: Volume 5, Section 5.4.7.2.4

Submitter reference: 2/52

Department of Natural Resources and Water (42), Environmental Protection Agency (45)

Proponent response

The Development will provide a significant network of environmental corridors throughout the Site. Figure 1.2.3 and 1.2.4 delineate the extent of these wildlife corridors. The main north-south corridor and east-west corridors are proposed to be over 100 m in average width. Sub-corridors along water courses are to be 50 m wide. This is a significant improvement and refinement on the proponent's EIS Master Plan. It provides habitat connectivity not currently provided throughout site and is in accordance, and in some cases exceeds, the setback requirements within the *Regional Vegetation Management Code*.

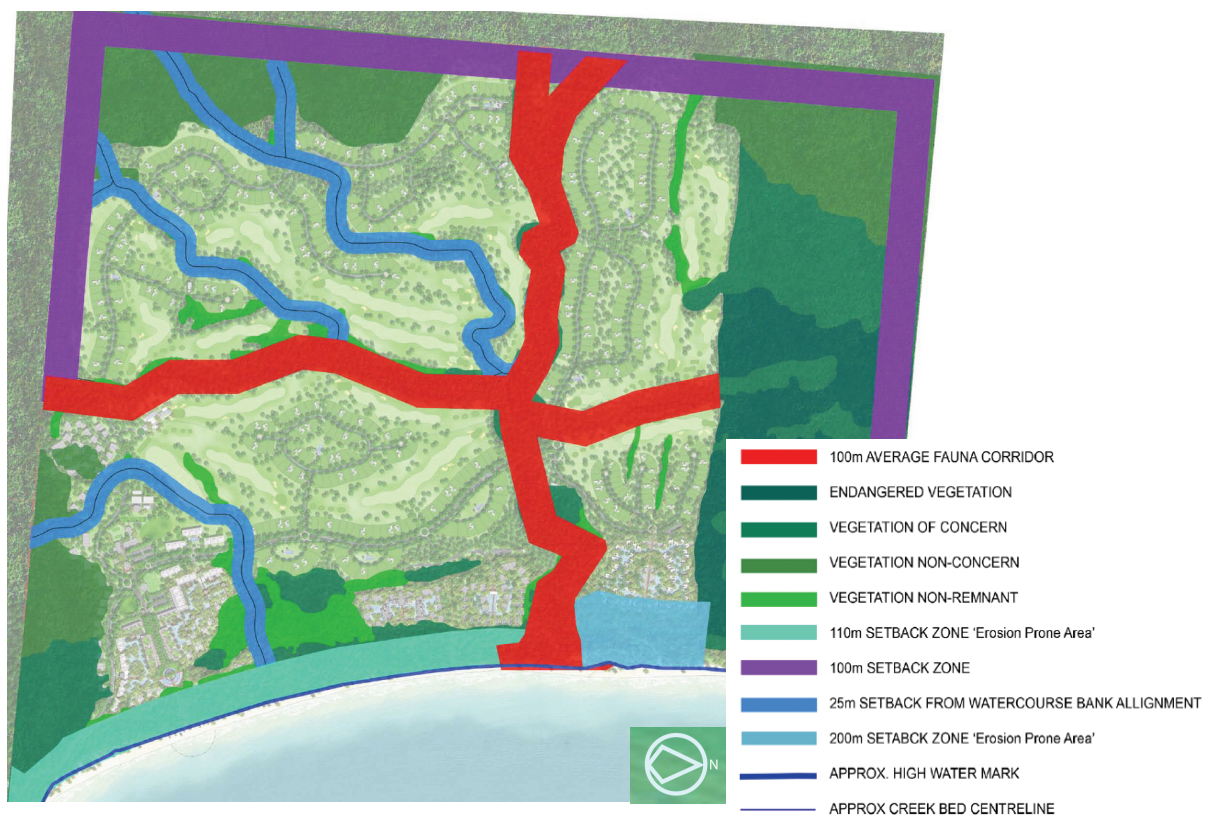


Figure 1.2.3: Proposed widths of vegetation corridors and setbacks (refer to Volume 3, Section 3.1)

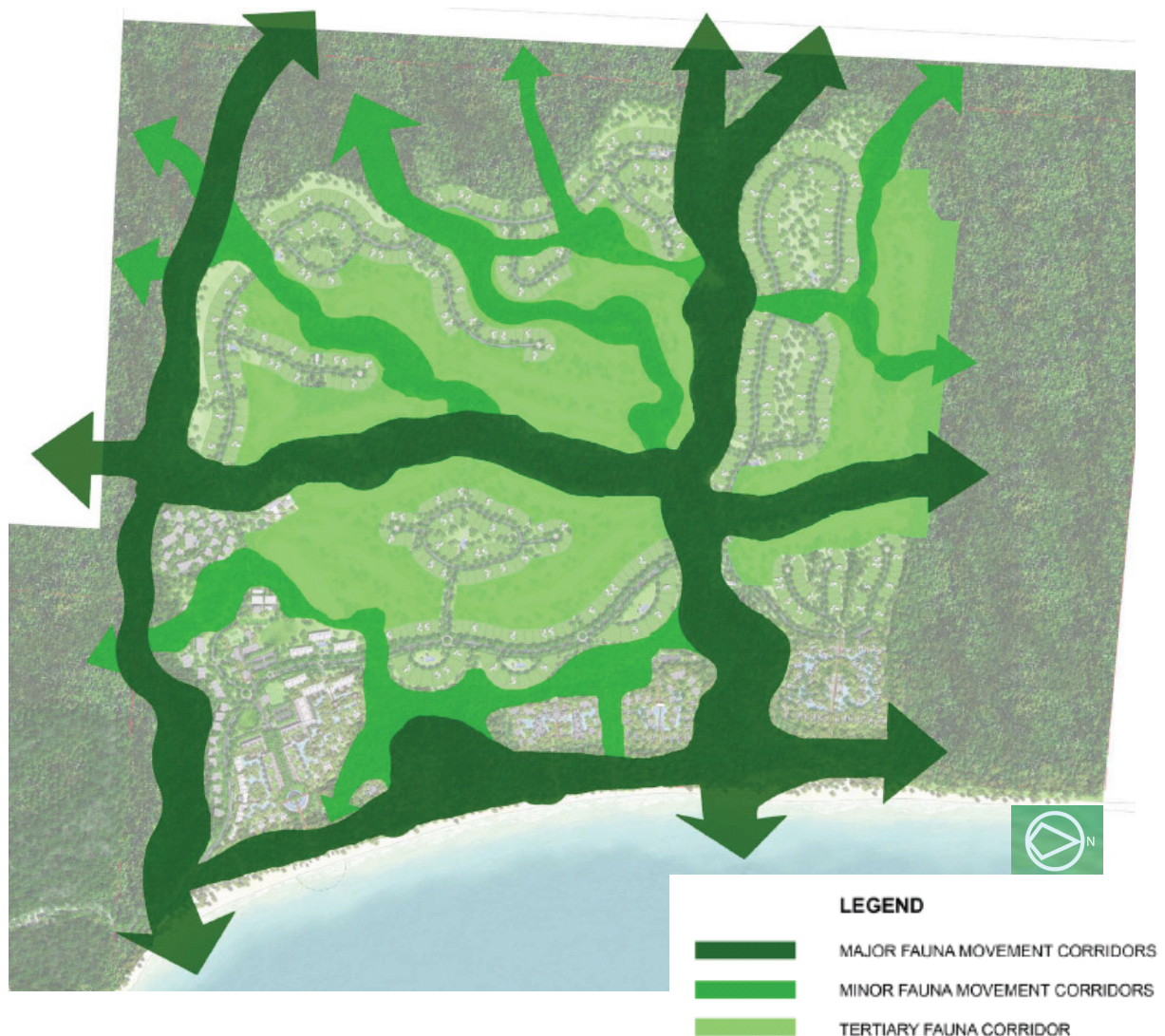


Figure 1.2.4: Plan indicating proposed fauna movement corridors (refer to Volume 3, Section 3.1)

While BAAM surveys and reporting have found that the largely cleared nature of the subject site reduces the likelihood of its contribution to local corridor values, in this context corridors of riparian vegetation on the subject site facilitate the movement of species between larger intact patches of vegetation in the south and west to coastal vegetation in the east. The riparian vegetation traversing the subject site is able to be used by a range of species. Macropods, rodents, bats and birds in particular are likely to move through these areas. Several species were observed moving along riparian habitats in behaviour that might suggest these strips are in fact utilised by local populations.

The BAAM survey concluded that at a regional level, corridor values present on the subject site cannot be considered to be significant, yet riparian vegetation may be of local importance in facilitating fauna movements in an east/west direction between rainforest vegetation and coastal/swamp vegetation. This may be of particular importance to local Southern Cassowaries which were observed traversing open pastures via this link.

The proponent aims to not only achieve no net negative impact on Cassowaries but also to restore the ecological connectivity internally within the site by expanding Cassowary habitat through an extensive re-vegetation program which will re-establish local Cassowary corridors meandering through the development. The emphasis on connecting Cassowary corridors from one habitat to the other is a key part of the Ella Bay plan. However, this will be integrated into the wider local and regional plans developed by Terrain Natural Resource Management (NRM) to help create extensive linked habitat corridors for the Cassowary.

A key aspect of the conservation/mitigation measures is the protection of fauna movement corridors and habitat. The presence of wildlife, including vulnerable and endangered species (including the endangered Southern Cassowary) within the Ella Bay site means that the Ella Bay Integrated Resort Proposal aims to incur no negative impacts upon the native fauna population and, through an extensive revegetation and rehabilitation program, including the net expansion of potential habitat and the protection and widening of east-west and north-south movement corridors, the development proposal aims to achieve a net positive impact throughout the development.

The proposal will provide four main corridors and a series of sub-corridors which generally follow small gullies. This includes specific east-west and north-south movement corridors which will allow the movement of Cassowaries and other fauna, and a series of sub-corridors, focusing on drainage lines, complements this strategy. Les Moore's Cassowary Assessment prior to the EIS recommended an additional northern corridor. This recommendation is to be implemented, with a minimum 50 m width extending from the central east-west corridor to the north of the site. A further northern corridor has also been added.

The creation of these corridors through revegetation and rehabilitation will amount to an additional 85.48 hectares of onsite connective fauna habitat. Figure 1.2.4 shows the major proposed fauna movement corridors within the Ella Bay Property superimposed onto the proposed Master Plan.

For further details refer to the full set of vegetation and corridor setback plans in Volume 3, Section 3.1.

1.2.4.2 Habitat and Corridor Planting Timeframes

A strategy identifying schedules and timeframes for habitat and corridor plantings should be produced that ensures the rate of maturation of revegetation mitigates the habitat lost during construction. Ideally planting would occur as the first phase of the project before other development proceeds. Replanting should include a mix of native species, but also consider historic vegetation patterns on the site.

EIS reference: Volume 3, Section 3.2.1 & Volume 5, Section 5.4.7.2.4

Submitter reference: 2/52

Environmental Protection Agency (45), Wet Tropics Management Authority (50)

Proponent response

The proponent recognises the importance that the habitat and corridor planting process is commenced in the early phases of the development, giving vegetation the opportunity to mature with development construction. Not-for-profit organisation Terrain Natural Resource Management (NRM) will be responsible for managing and implementing revegetation and rehabilitation programs, which are to be commenced at the initial phase of the project.

A partnership has been developed with Terrain NRM and offset broker Degree Celsius to negotiate a detailed Regulated Offsets and Additional Environmental Investments Strategy and the Ella Bay Environmental Trust. Planting and rehabilitation management is to be conducted through the Trust in partnership with Terrain NRM. Funding for revegetation and rehabilitation is included in a schedule in the draft *Integrated Package of Regulated Offsets and Additional Environmental Investments* (currently under negotiation with government agencies). The proposed schedule will provide up front funding, followed by proportional funding over time to coincide with stages of development construction. The proposed initial allocation of funding will enable Terrain NRM to commence rehabilitation and revegetation programs shortly after approval. A staging plan (Volume 3, Section 3.1) also indicatively shows how the site will be revegetated in conjunction with the staging of the project.

Research is to be undertaken to determine the most suitable endemic species to be included in the replanting process, considering current, historic and appropriate vegetation patterns. Terrain NRM's Landscape Rehabilitation Unit will oversee the delivery of the significant rehabilitation of the internal corridor rehabilitation activities as well as enhancement and maintenance of the biodiversity values in the coastal zone. This work will be carried out in partnership with the Johnstone Shire Council's rehabilitation nursery, and local traditional owners. In itself, this would maximise local employment outcomes from the development. It would also allow a reasonable maintenance period to enable the achievement of effective outcomes. It is not possible at this stage to accurately quantify the proportion of weeds in the non-remnant and remnant vegetation, nor is it possible to accurately determine the period of time it would take to return the non-remnant vegetation to remnant status and quality. The scale of revegetation proposed, however, is significantly greater than the very minimal losses caused by



the proposed development, and the proponent is committing to managing these areas until satisfactorily rehabilitated.

1.2.4.3 Dead Trees

Dead trees and branches often provide hollows used for nesting by wildlife. The EIS does not discuss the value and management of dead trees and limbs.

EIS reference: Volume 5, Section 5

Submitter reference: 1/52

Wet Tropics Management Authority (50)

Proponent response

The number of dead trees within the region has greatly increased following the occurrence of Cyclone Larry in 2006. A number of the regional ecosystems damaged are proposed to be rehabilitated as part of the Terrain NRM revegetation and rehabilitation program, however it is intended that the dead trees in these areas will be retained for their value to wildlife.

The areas on the site which are proposed for development are largely restricted to cleared land, which does not include dead trees. Vegetation clearance proposed by the Ella Bay Integrated Resort is to be minimal, and restricted largely to regional ecosystems that are not of concern. Dead trees located in these minimal areas that are subject to clearing will be removed.

The Land for Wildlife Note No. 5, 'The Value of Dead Wood to Wildlife and Agriculture,' written by Doug Robinson & WB in November 1999, is a publication of the Environmental Protection Agency and Queensland Parks and Wildlife Service. The report concludes that dead wood and limbs have an important value. They provide:

- an excellent roost site for bats. Bats are insect eaters and look for food over paddocks as well as amongst trees that form the basis of woodlots and shelterbelts and which contribute to agricultural production. Insectivorous bats consume many agricultural pest species. Studies of the Lesser Long-eared Bat show that greater than 75% of roosting sites occur within dead trees, or dead sections of living trees. This may be related to the different insulating qualities of dead wood. A dead tree or branch can thus indirectly contribute to natural pest control and, consequently, reduce reliance on expensive pesticides.
- perching sites for birds of prey, and other species, which pounce on ground-dwelling prey, such as robins and Cuckoo Shrikes, which help to keep agricultural pest species in check. At night, owls may be found using dead trees or branches, whether in a forest or more open situation, as observation points for hunting.
- sources of the largest hollows that are used by black cockatoos, large owls, sugar gliders and other wildlife species. Large old trees have features that young trees do not, and dead trees are often the last representatives, in many areas, of the largest trees.

- important sources of insects for insect-eating birds. Decaying wood and flaking bark are particularly rich sites for insects and birds take advantage of this. More insect-eating birds around a property helps keep insect numbers low, reduces reliance on potentially dangerous chemical controls, and assists with protecting the health of bushland used for shade, shelter or to prevent land degradation.
- a place to nest for some bird species that place their nest solely or primarily on dead branches. For example, sittellas are obligate dead wood nesters and require vertical dead branches for breeding. Dead branches are often associated with hollows and hollow development. Mammals, (including bats), birds, reptiles, amphibians and invertebrates use hollows. Dead branches may be habitat in themselves for a number of invertebrate species. Twigs are an important nesting material being used by a wide variety of species, including eagles. Cuckoos use dead branches for singing, an important part of courtship prior to breeding.
- a source of lichen and cobweb that is used by birds in nest construction. Fantails, cuckoo shrikes, robins, sittellas, thornbills, warblers, and many honeyeaters use spider web either as an agent to attach the nest or to bind the other nest materials. Lichens and cobweb are most abundant on dead wood.
- supplies of logs, branches and twigs that provide important habitat for ground-dwelling wildlife such as Bush Stone-curlew, nightjars, reptiles and small native mammals, as well as in-stream habitat for fish and invertebrates.

1.2.5 Submitter Issue: Marine Environments

1.2.5.1 Impact on Marine Plants

The nature, extent and location of any proposed marine plant disturbance must be clarified. Retention of freshwater mangrove (*Barringtonia racemosa*), *Hibiscus tiliaceus* and *Melaleuca quinquenervia* must be addressed given the connectivity of these fish habitats. Details about the proposed use and potential impacts on foreshore marine plants by a protected swimming zone and any foreshore modification should also be further investigated.

EIS reference: Volume 4, Section 4.7.1.2 & 4.7.2

Submitter reference: 1/52

Department of Primary Industries and Fisheries (43)

Proponent response

As discussed in Section 1.2.2.3, no marine flora was recorded on the subject site. Stinger nets are common on the coast and impact on marine plants is minimal, and the only minor foreshore disturbance proposed is for defined walking tracks to the beach.

The proposed swimming zone will be demarcated on the seaward front by a line of coloured floats and buoys. In this area, designated for swimming, no conflicting uses will be permitted, for example the use of motorised boats or similar devices. The impact on marine habitat is minimised by restricting swimming to this zone. Therefore the presence of a swimming zone is for the protection of both the users and the marine environment.

It is acknowledged that all marine plants in Queensland are protected. Section 8 of the *Fisheries Act 1994* defines marine plants as the following:

- A plant (a tidal plant) that usually grows on or adjacent to, tidal land; whether it is living or dead, standing or fallen.
- Material of a tidal plant or other plant material on tidal land.
- A plant, or material of a plant, prescribed under a management plan or regulation to be a marine plant.

This definition includes (but is not limited to) mangroves, seagrass, saltcouch, and samphire vegetation species. It was noted in 3D Environmental (2006) that the presence of *Hibiscus tiliaceus* generally indicates occasional tidal inundation or slightly saline surface water. The regional ecosystem that was recorded as supporting *Hibiscus tiliaceus* was RE 7.2.8, outside of any tidal influence.

Melaleuca quinquenervia was recorded from RE 7.2.9 and from mapped vegetation community 33.

Once again, tidal inundation is unlikely or extremely rare in these locations and the presence of the species is related to freshwater inundation. *Barringtonia racemosa* was recorded with RE 7.2.9 and from mapped vegetation communities E3, Ra, 3a and 33 within areas that are not known to be subject to tidal

inundation. The species is most often found on the landward edge of wet tropical mangrove forests, often growing upstream in rivers. It is not confined to tidal areas.

Conceptual Surface Water and Groundwater Hydrology Models (Golder 2007) (refer to Volume 4, Appendix A.2.1) found that electrical conductivity within the wetland swale was higher than measured in surface water and groundwater to date within the Site, however the results were within or just above the freshwater aquatic ecosystem guidelines and significantly below seawater concentrations. This suggests that freshwater conditions could be predominant within the wetland swale located behind Southern Ella Bay Beach Dune during and immediately following 'wet' season periods.

1.2.5.2 Great Barrier Reef World Heritage Area

The EIS refers to the WTWHA and the Great Barrier Reef—there is a need to acknowledge the proximity of the development to the Great Barrier Reef World Heritage Area (GBRWH). The schematic drawings indicate that there will be motorised boats in the recreation zone. No further information has been provided. Such activities would require a permit from GBRMPA.

EIS reference: Volume 1, 3 & 4

Submitter reference: 1/52

Department of Environment and Water Resources (51)

Proponent response

The proposed Ella Bay Integrated Resort is located adjacent to the Great Barrier Reef World Heritage Area with The Great Barrier Reef located approximately 36 km offshore (see figure 1.2.5). The Coral Sea directly to the east of the site is located within the General Use Zone of the GBRWH.

This part of the GBRWH is also located to the north of a Designated Shipping Area boundary; meaning that shipping (vessels longer than 50 m) is not permitted within this area (see figure 1.2.6). Schematic drawings provided in the EIS included motorised boats. However, no plans at this stage have been made for the inclusion of motorised boats in the recreation zone and this has been removed from the schematic Master Plan. On-site marine facilities are not proposed and the proponent does not anticipate any increased marine activities and associated impacts on the Great Barrier Reef due to this Ella Bay Integrated Resort proceeding.

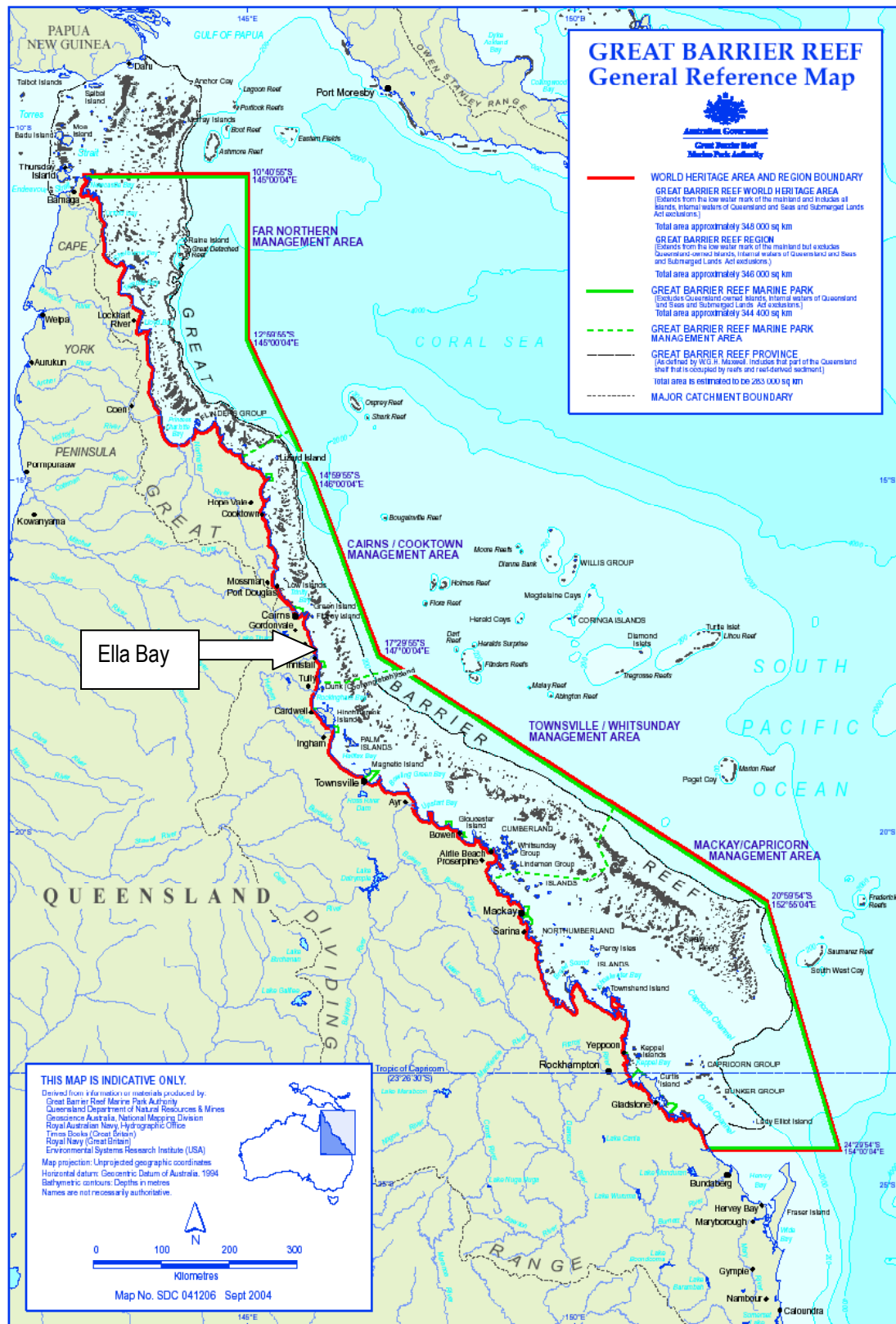


Figure 1.2.5: Great Barrier Reef General Reference Map

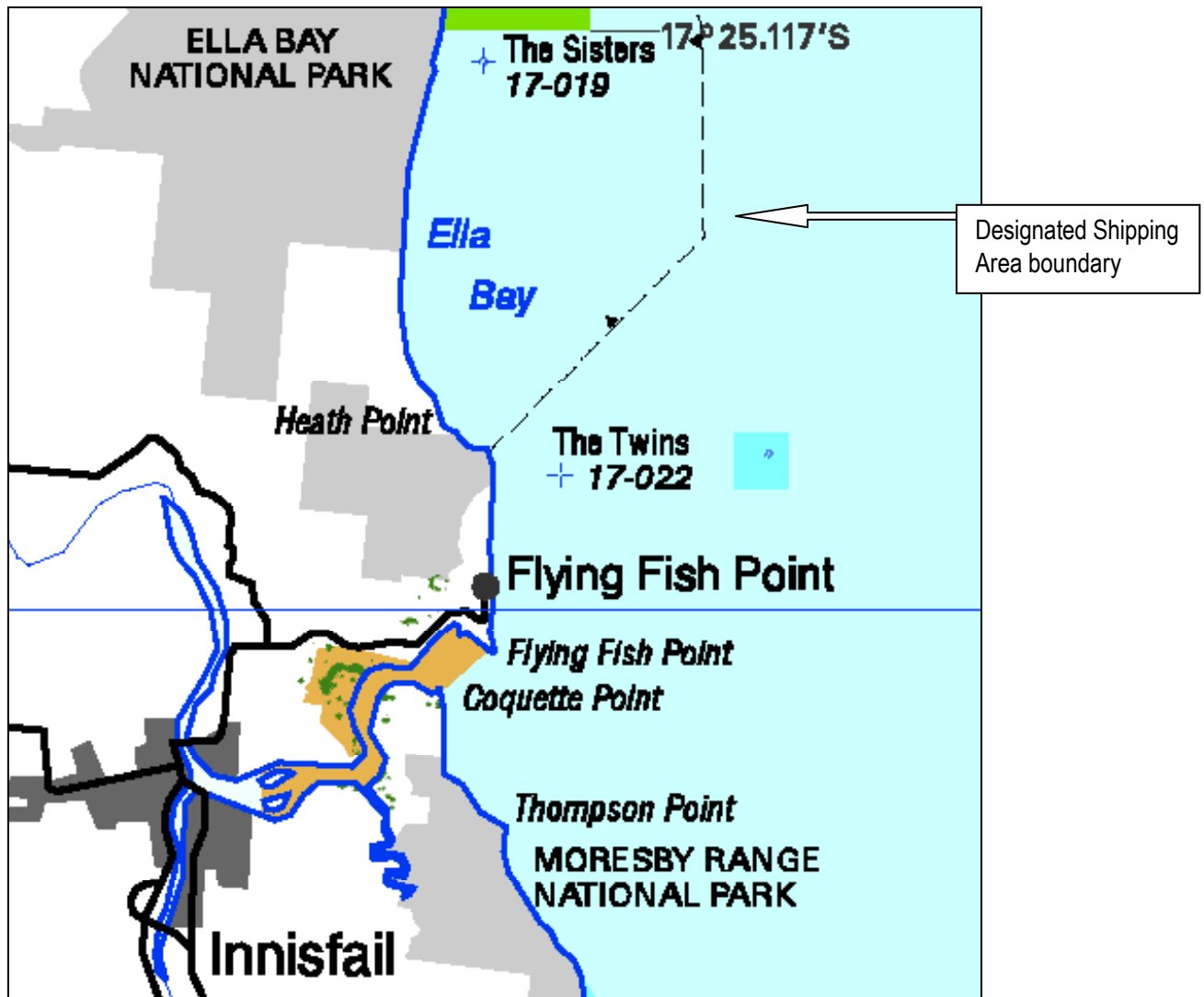


Figure 1.2.6: Designated Shipping Area boundary, Great Barrier Reef Marine Park Authority.

1.2.6 Submitter Issue: Vegetation Clearing

Background

In response to submissions received relating to vegetation clearing, the Master Plan has been refined and improved to limit the overall amount of clearing required for the proposal, and to significantly improve and increase onsite and offsite ecosystems.

In consideration of the minimal clearing required and the overall proposed rehabilitation and revegetation works, the Ella Bay Integrated Resort offers a significant 'net gain' in ecosystem of 81.16 ha. This will enhance existing ecosystem quality and quantity and provide extensive habitat connectivity within and beyond the site.

A large proportion of the Ella Bay property is currently degraded and cleared as a result of the existing cattle and agricultural use. The Ella Bay Integrated Resort proposes to construct predominantly within existing cleared areas with only minor areas of clearing to be conducted onsite.

The table below (table 1.2.1) indicates the total extent of onsite and offsite clearing for the proposal and vegetation types to be cleared.

Remnant Vegetation to be Cleared				
	Not of Concern	Of Concern	Endangered	TOTAL
Ella Bay Site	0.86 ha	0.25 ha	0	1.11 ha
Access Road	1.86 ha	0.58 ha	0	2.44 ha
TOTAL	2.72 ha	0.83 ha	0	3.55 ha

Table 1.2.1: Remnant vegetation to be cleared

The clearing required for the proposal including the access road and associated Flying Fish Point bypass is to be more than offset. The draft *Integrated Package of Regulated Offsets and Additional Environmental Investments* provides a detailed set of works and actions proposed to mitigate or offset impacts on regional ecosystems of significance and is currently under negotiation with government agencies. An essential component of the offset package will involve revegetation and rehabilitation works both offsite and onsite.

The following table (table 1.2.2) indicates the proposed areas to be rehabilitated and revegetated.

Rehabilitation and Revegetation				
REHABILITATION	Not of Concern	Of Concern	Endangered	TOTAL
<i>Ella Bay Site</i>	20.535 ha*	20.535 ha*	0	41.07 ha
<i>Access Road</i>	0	0	0	0
TOTAL	20.535 ha	20.535 ha	0	41.07 ha
REVEGETATION	Not of Concern	Of Concern	Endangered	TOTAL
<i>Ella Bay Site</i>	21.575 ha*	21.575 ha*	0	43.15 ha
<i>Access Road</i>	0	0.49 ha	0	0.49 ha
TOTAL	21.575 ha	22.065 ha	0	43.64 ha
TOTAL REVEGETATION AND REHABILITATION				84.71 ha

Table 1.2.2: Proposed revegetation and rehabilitation works

The proposed *Integrated Package of Regulated Offsets and Additional Environmental Investments* (currently under negotiation with government agencies) expands on offsets as merely compensatory regulatory mechanisms and achieving performance requirements, to embrace the concept of 'additionality': a project or positive outcome that would not have come about without the project. In effect the aim is that this would be a 'net gain' development.

An example is highlighted by the proposed overall net gain in ecosystem of 81.16 ha as a result of extensive revegetation and rehabilitation works, identified in the table below (table 1.2.3).

Overall Clearing, Rehabilitation and Revegetation Summary				
	Not of Concern	Of Concern	Endangered	TOTAL
Total Rehabilitated	20.535 ha	20.535 ha	0	41.07 ha
Total Revegetated	21.575 ha	22.065 ha	0	43.64 ha
Less Total Cleared	2.72 ha	0.83 ha	0	3.55 ha
NET GAIN	39.39 ha	41.77 ha	0	81.16 ha

Table 1.2.3: Onsite and offsite clearing, rehabilitation and revegetation summary for the proposal

The following figures (1.2.7 and 1.2.8) show the location of the proposed minimal clearing works and the total area to be rehabilitated and revegetated onsite, highlighting the extent of net gain in ecosystem. They have been developed from mapping of remnant vegetation by 3D Environmental as it is considered to be more accurate than Regional Ecosystem mapping.

* split in vegetation type is indicative at this stage and subject to final calculations

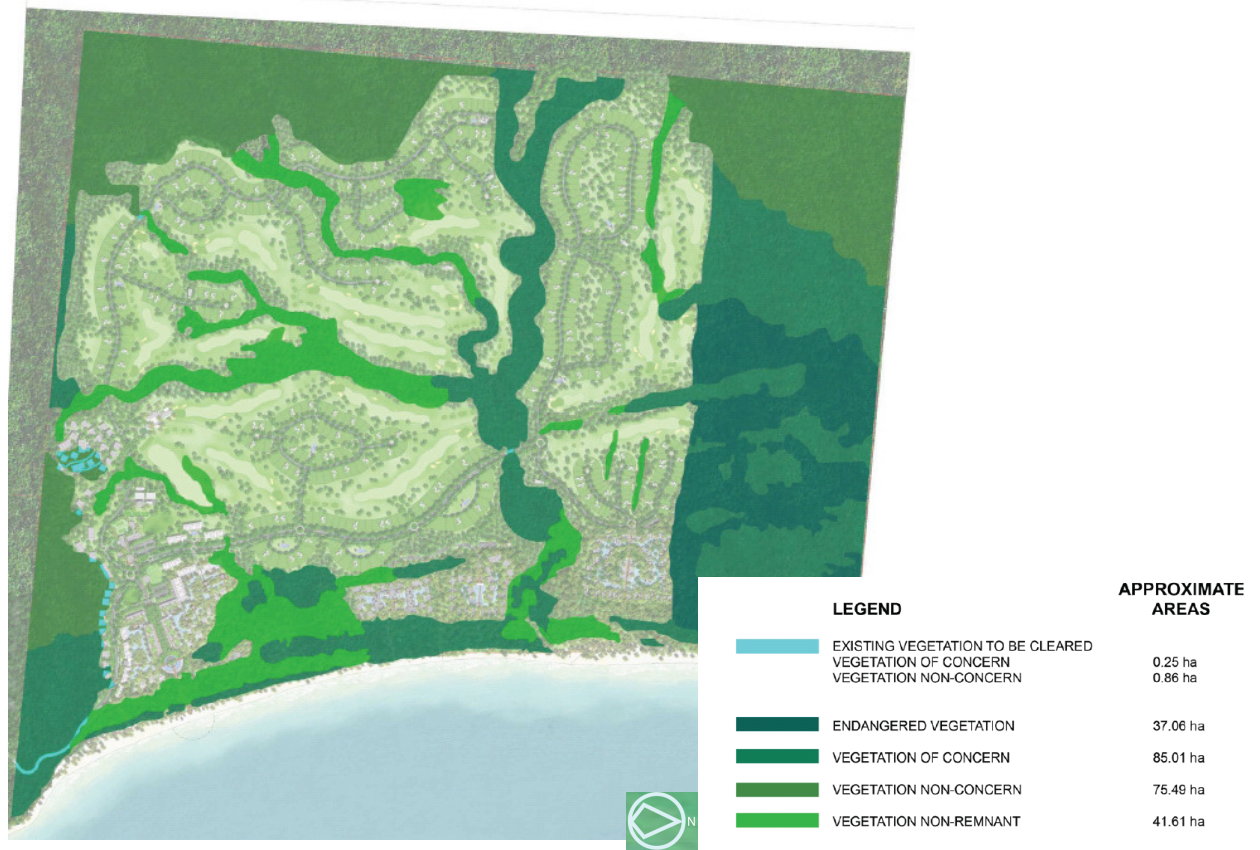


Figure 1.2.7: Areas proposed to be cleared onsite (Volume 3, Section 3.1)



Figure 1.2.8: Revegetation and rehabilitation plan (Volume 3, Section 3.1)

The following figures (1.2.9 and 1.2.10) show the location of the road alignment developed in the Access Road Strategy – Environment North (Volume 4 – Appendix A.2.6) and the minimal clearing that is required.



Figure 1.2.9: Aerial photograph of the proposed road alignment.

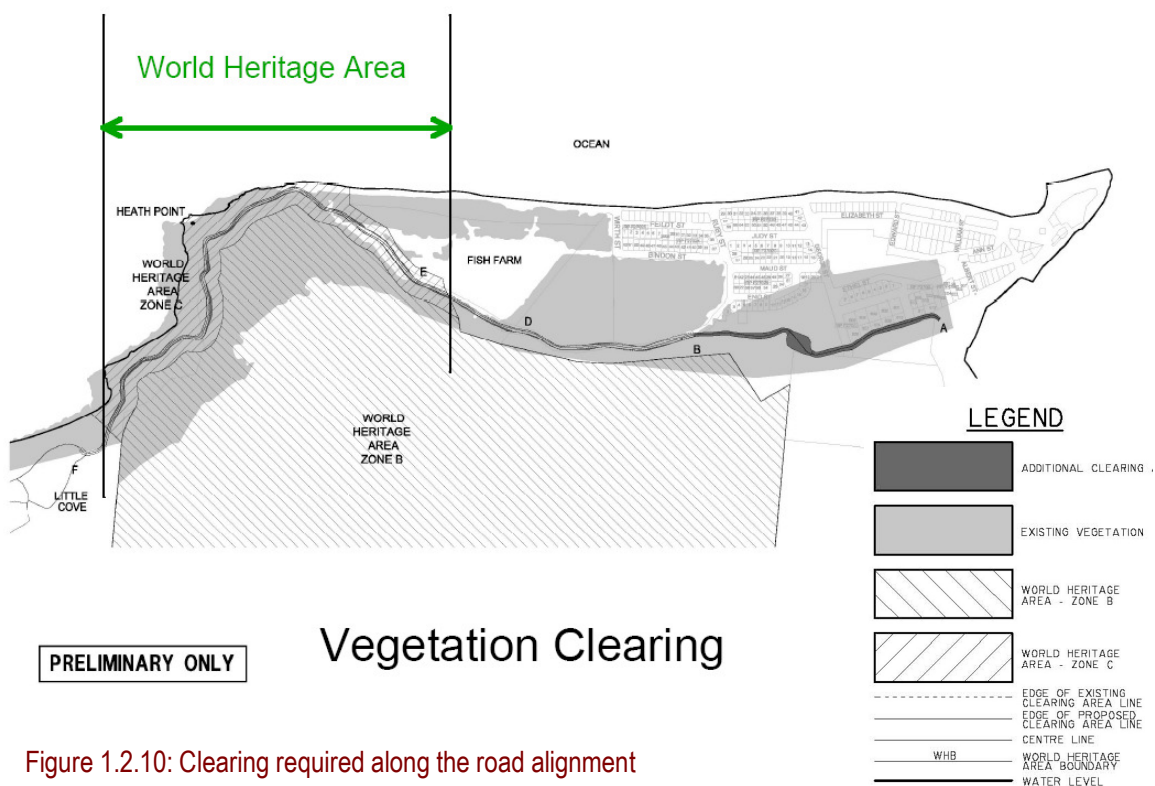


Figure 1.2.10: Clearing required along the road alignment

As a result of minimising clearing and incorporating extensive rehabilitation and revegetation works, the Ella Bay Integrated Resort offers a significant net gain in ecosystem, enhancing existing ecosystem quality and quantity and providing extensive habitat connectivity within and beyond the site. This is highlighted in the fauna corridor plan below (figure 1.2.11).

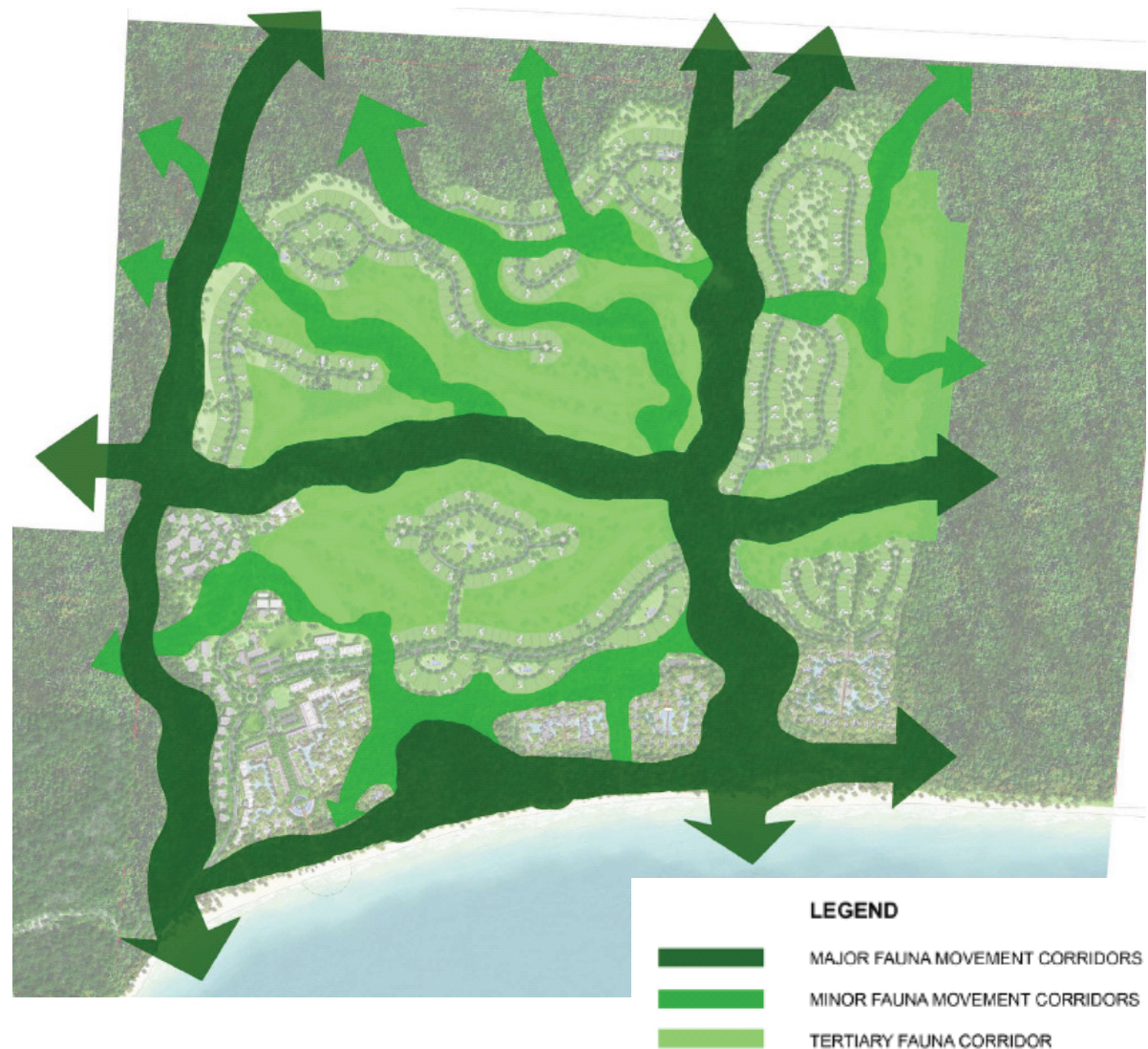


Figure 1.2.11: Proposed fauna movement corridors (refer to Volume 3, Section 3.1)

Further details on mitigation and offset measures are available in *Regulated Offsets and Additional Environmental Investments* (Volume 2, Section 2.7.3) and *Integrated Package of Regulated Offsets and Additional Environmental Investments* (currently under negotiation with government agencies)

1.2.6.1 Vegetation Clearing in the South-East Corner of the Site

A number of views were expressed regarding the proposed vegetation clearing in the south-east corner of the subject Site.

A) Regional ecosystems 'of concern' in the south-east of the proposed development needs further investigation. The report does not directly deal with the loss of these regional ecosystems or the number of rare plant species occurring there. These values may not be satisfactorily achieved by the use of off-set mechanisms. Analysis of flora and fauna needs to consider not just the existing environment but also the consequences of the proposed losses in a wider context.

B) Describe a modified plan which avoids the need for clearing 'of concern' regional ecosystems and essential Cassowary habitat in the south-eastern corner of the property, to make way for proposed development.

C) The proponent should demonstrate how the proposed development will meet Performance Requirement S.7 and S.8.

Performance Requirement S.7: In the south-east clearing will occur in 'of concern' regional ecosystem that is listed in Table 2 of the *Regional Vegetation Management Code: Coastal Bioregions* to a width greater than 10 m wide or 0.5 hectares (south-east corner, RE 7.11.25).

Performance Requirement S.8: Area of remnant vegetation subject to clearing (south-east corner) is mapped as being essential habitat as it has three essential habitat factors: Regional Ecosystem (7.3.10; 7.11.25; 7.11.1), Vegetation Community (vine forest) and Altitude to 1000 m.

D) The area is 'of concern' vegetation and is actively used by Cassowaries. Any clearing in this area will not comply with statutory requirements for clearing for Significant Projects as given in the *Regional Vegetation Management Code: Coastal Bioregion*, being classified as essential habitat for an endangered species and being mapped as 'of concern' vegetation. The proponent should investigate the legality of any removal.

EIS reference: Volume 3, Section 3.4.3

Submitter reference: 22/52

E Bock (11), B Harvey (C4) (12), J Beasley (14), Performa letter (15 submissions) (17,22-35), J Rainbird (CAFNEC) (20), Department of Natural Resources and Water (42), Wet Tropics Management Authority (50), Environmental Protection Agency.(45)

Proponent response

The south-east corner of the proposed development [see figure 1.2.12 (Supplementary EIS Master Plan) and figure 1.2.13 (EIS Master Plan) below] has now been refined and improved as a result of the submissions process, taking into consideration the concerns of the public and government authorities.



Figure 1.2.12: The refined design of the south-east corner of the proposed development (see Volume 3, Section 3.1)



Figure 1.2.13: The previous design of the south east corner of the proposed development (see EIS Exec Summary)

The south-east corner villas have now been relocated away from an area recognised as containing vegetation 'of concern' to an area of 'not of concern'. As an additional benefit, this change has created a further east-west corridor leading to the beach area. Furthermore, the Master Plan has been reviewed and some dwellings have been relocated to other areas that are less sensitive. As a result, there is no requirement for the access road up the hill thereby resulting in no segmentation of habitat and clearing of 'of concern' vegetation. As a consequence of these refinements proposed clearing of vegetation in this area has reduced and the extent of proposed clearing is on the perimeter of the 'not of concern' vegetation. Clearing of 'of concern' vegetation in the south-east corner of the site has been effectively reduced to the minimal amount required to allow for the access road into the site. This can be seen in the following figure (Figure 1.2.14), which identifies the status of regional ecosystems in the south-eastern corner and the areas proposed to be cleared.



Figure 1.2.14: Areas proposed to be cleared (Volume 3, Section 3.1)

Specific submissions relating to the south-east are individually addressed below:

- A)** *Regional ecosystems 'of concern' in the south-east of the proposed development needs further investigation. The report does not directly deal with the loss of these regional ecosystems or the number of rare plant species occurring there. These values may not be satisfactorily achieved by the use of off-set mechanisms. Analysis of flora and fauna needs to consider not*

just the existing environment but also the consequences of the proposed losses in a wider context.

As discussed above, refinements to the Master Plan have allowed for the relocation of dwellings and villas away from the area recognised as containing vegetation 'of concern' in the south-east corner. As a consequence of these refinements proposed clearing of vegetation in this area has reduced and the extent of proposed clearing is on the perimeter of the 'not of concern' vegetation.

The draft *Integrated Package of Regulated Offsets and Additional Environmental Investments* (currently under negotiation with government agencies) provides on-site and off-site works or actions to mitigate or offset impacts on regional ecosystems of significance taking into consideration existing environmental values and the consequences of losses in a wider context. However, the proposed offset package expands on offsets as merely compensatory regulatory mechanisms to embrace the concept of 'additionality': a project or positive outcome that would not have come about without the project. In effect the aim is that this would be a 'net gain' development.

- B)** *Describe a modified plan which avoids the need for clearing 'of concern' regional ecosystems and essential Cassowary habitat in the south-eastern corner of the property, to make way for proposed development.*

The Master Plan has been refined to avoid the need for clearing of 'of concern' vegetation and essential Cassowary habitat for villas or dwellings (see figures above).

- C)** *The proponent should demonstrate how the proposed development will meet Performance Requirement S.7 and S.8 of the Regional Vegetation Management Code: Coastal Bioregions.*

As discussed above, the refined Master Plan now avoids the need to clear 'of concern' vegetation for villas or dwellings. Therefore the proposal is in accordance with Performance Requirements S.7 and S.8 of the *Regional Vegetation Management Code*.

- D)** *The area is 'of concern' vegetation and is actively used by Cassowaries. Any clearing in this area will not comply with statutory requirements for clearing for Significant Projects as given in the Regional Vegetation Management Code: Coastal Bioregion, being classified as essential habitat for an endangered species and being mapped as 'of concern' vegetation. The proponent should investigate the legality of any removal.*

As discussed above, the refinements made to the Master Plan have avoided the need to clear 'of concern' vegetation for dwellings or villas in the south-east corner and is in accordance with the requirements of the *Regional Vegetation Management Code: Coastal Bioregions*.

1.2.6.2 Clearing of other areas

Other areas of proposed vegetation clearing were raised within submissions.

A) Performance Requirement S.3

The proponent should demonstrate how the proposed development meets Performance Requirement S.3 of the *Regional Vegetation Management Code (RVMC)*.

The proposed remnant vegetation removal plan (see EIS Vol 3, fig. 3.22 D, p 43) indicates that the development will require a crossing of a water course classified as stream order three. The EIS states that crossings and bridges will be constructed and that buffers along the creeks will be retained. This application is considered to fail this acceptable solution because clearing will occur within 25 m of a water course classified as stream order three.

B) Performance Requirement S.4

The proponent should demonstrate how the proposed development will meet Performance Requirement S.4 of the *RVMC*.

Two areas of concern are located in the north-east (RE 7.3.10) and south-west (RE 7.11.1) (from Regional Ecosystem Mapping NRW). The development will require clearing that will reduce areas of contiguous vegetation to less than 10 hectares and will occur where the width of remnant vegetation is less than 200 m. Specifically the Master Plan indicates that:

- a road will traverse RE 7.3.10 reducing an area of contiguous vegetation to approximately 4.45ha
- a road will traverse RE 7.11.1 reducing an area of contiguous vegetation to approximately 0.73ha
- clearing will occur where the width of remnant vegetation is less than 200 m.

The applicant has stated that they will do revegetation works as part of their development. This helps, but it is not adequate to meet the Performance Requirement.

The application is considered to fail this acceptable solution because clearing will reduce areas of contiguous vegetation to less than 10 hectares and clearing will occur where the width of remnant vegetation is less than 200 m.

EIS reference: Volume 3, Section 3.4

Submitter reference: 1/52

Department of Natural Resources and Water (42)

Proponent response

The impact of all the proposed minor clearing works are to be mitigated or offset and a detailed discussion of this process is provided in the *Integrated Package of Regulated Offsets and Offsets* currently under negotiation with government agencies.

A) Performance Requirement S.3

Performance Requirement S.3—Watercourses of Part S (Requirements for clearing of significant projects) of the *Regional Vegetation Management Code: Coastal Bioregions* is provided to regulate the clearing of vegetation in a way that does not cause land degradation, prevents the loss of biodiversity and maintains ecological processes and to maintain the current extent of assessable vegetation associated with any watercourse to provide:

- bank stability by protecting against bank erosion;
- water quality by filtering sediments, nutrients and other pollutants;
- aquatic habitat; and
- terrestrial habitat.

The Development is considered to achieve an acceptable solution to Performance Requirement S.3.

Connectivity within the development is required to allow residents and visitors to go about their daily activities. To provide this connectivity a single lane fauna friendly bridge is required to pass through the east-west riparian strip in the north-east of the site. The bridge will pass over the watercourse allowing vegetation to grow underneath and will be at low speed (20 km per hour). It will require minimal clearing as it is to be constructed at the narrowest section of vegetation and is to be approximately 8 metre wide (refer to figure 1.2.15).

Table 1 from the *RVMC* indicates the distance from the high banks of watercourses in which clearing cannot occur (see table 1.2.2). The watercourse is of 'Stream Order 3' and therefore requires a clearing free setback of 25 m from each high bank. The east-west and north-south riparian strips are proposed to involve an average 100 m wide vegetation corridor. This will ensure bank stability by protecting against bank erosion, maintain water quality by filtering sediments, nutrients and other pollutants and provide significant aquatic and terrestrial habitat.

Offsetting of the minimal areas of clearing and ongoing rehabilitation and revegetation of watercourses is to be conducted in partnership with Terrain NRM and Degree Celcius and a draft *Integrated Package of Regulated Offsets and Additional Environmental Investments* has been developed and is currently under negotiation with government agencies.

It is therefore considered that the Ella Bay Integrated Resort Proposal achieves an 'Acceptable Solution' to Performance Requirement S.3—Watercourses.

Stream Order	Subregion	Distance from Each High Bank
1, 2, 3, or 4	The Wet Tropics Bioregion and Subregions 8. 2 (Proserpine-Sarina Lowlands) and 8.6 (Debella) of the Central Queensland Coast Bioregion	25 metres
1 or 2	All other Subregions of the Central Queensland Coast Bioregion	50 metres
5 or greater	The Wet Tropics Bioregion and Subregions 8. 2 (Proserpine-Sarina Lowlands) and 8.6 (Debella) of the Central Queensland Coast Bioregion	50 metres
5 or greater	All other Subregions of the Central Queensland Coast Bioregion	100 metres

Table 1.2.2: Table 1 from the RVMC

B) Performance Requirement S.4

Performance Requirement S.4—Connectivity of Part S (Requirements for clearing of significant projects) of the *Regional Vegetation Management Code: Coastal Bioregions* is provided to regulate the clearing of vegetation in a way that prevents the loss of biodiversity and maintains ecological processes. Areas of remnant vegetation are:

- of sufficient size and configured in a way to maintain ecosystem functioning;
- of sufficient size and configured in a way to remain in the landscape in spite of any threatening processes; and
- located on the lot(s) that are the subject of the application to maintain connectivity to remnant vegetation on adjacent properties.

The development is considered to achieve an acceptable solution for Performance Requirement S.4.

The submission concern relates to the clearing in the east-west riparian strip (discussed above) and in the south-west corner of the site and are identified in the clearing plan (figure 1.2.15). These areas have been selected as they are generally the narrowest strips of vegetation and therefore clearing within these areas is to be minimal. This minimal clearing (a total of approximately 1.11 ha onsite) will occur to provide mobility and connectivity for residents within the development. Extensive offsetting and revegetation and rehabilitation works (a total of approximately 80 ha onsite) are to be conducted which will substantially improve connectivity within and beyond the site (refer to figure 1.2.11). Further details on this process are provided in the draft *Integrated Package of Regulated Offsets and Additional Environmental Investments* and is currently under negotiation with government agencies.

It is therefore considered that the Ella Bay Integrated Resort Proposal achieves an 'Acceptable Solution' to Performance Requirement S.4—Connectivity.



Figure 1.2.15: Clearing plan indicating the two areas of concern discussed (Volume 3, Section 3.1)

1.2.7 Submitter Issue: Vegetation

1.2.7.1 Regional Ecosystems

Regional ecosystem mapping should be clarified, in both type and extent in several parts of the subject site. The survey was completed five months after Cyclone Larry and the survey report acknowledged that vegetation was wind damaged. This may have underrepresented the actual remnant vegetation component.

EIS reference: Volume 8, Appendix A.6.1

Submitter reference: 1/52

Department of Natural Resources and Water (42)

Proponent response

Vegetation mapping was based on pre-Cyclone Larry aerial photography. The mapping was undertaken to represent the extent and composition of the vegetation communities pre-cyclone. The vegetation consultants are satisfied that the mapping as provided is a thorough representation of pre-cyclone conditions. The area was ground truthed in October, 2006 and the Department of Natural Resources and Water have acknowledged differences in the mapping data.

1.2.7.2 Definition

The term 'open woodland' needs defining to avoid confusion.

EIS reference: Volume 3, Section 3.4.3

Submitter reference: 1/52

Wet Tropics Management Authority (50)

Proponent response

The term 'open woodland' refers to scattered rainforest vegetation that forms landscaping of the Township for the golf course and community open space. It adds to the biodiversity value of the site and the Master Plan (see figure 1.2.16) indicates the extensive trees and vegetation to be included throughout the development, not just within wildlife corridors. While this is not a return to the condition of the land prior to tree clearing, it should be noted that this land is currently cleared pastoral lands therefore the proposed revegetation works will provide significant environmental benefits.



Figure 1.2.16: Master plan highlighting the extent of onsite vegetation (Volume 3, Section 3.1)

1.2.7.3 Pest Species

Non-native animal pest species currently not in the area or that currently occur only in low numbers could benefit from the proposed habitat modifications and impact the WTQWHA. These species includes Indian mynahs, house sparrows, cane toads and introduced species of rats.

EIS reference: Volume 3, Section 3.4.3

Submitter reference: 1/52

Wet Tropics Management Authority (50)

Proponent response

A Pest Species Management Plan will be prepared as part of the operational works phase of the project to control the numbers of feral species present, as well as potential future pest species, within and surrounding the Development. A Weed Management Strategy and a Rehabilitation and Revegetation Program will also be developed in conjunction with Terrain NRM and Degrees Celcius to eliminate pest vegetation species and to rehabilitate and revegetate habitat. Consultation with the Queensland Parks and Wildlife Services will be undertaken to co-ordinate management strategies, responses and practices within Ella Bay National Park.

It is considered that educating residents and visitors will play an integral role in the development of a successful Pest Species Management Plan. The role of the Welcome Centre (for further detail see Volume 2, Section 2.2.3) will be to raise awareness of the sensitive and significant surrounding environment, and highlight the responsibilities of residents and visitors in ensuring the eradication of pest species and eliminating the introduction of new pest species. The Principles for Design and Living at Ella Bay (see Volume 2, Section 2.6.2) will ensure owners are aware and adhere to suitable native species for landscaping—species that provide biodiversity value and do not encourage pest animal species.

1.2.7.4 Edge Effects and Cumulative Impacts

Potential cumulative impacts after construction phase were not addressed in EIS. Urban 'edge effects' can permeate between 180-254 m into surrounding habitats. Urban permeation into the surrounding landscape includes vegetation dumping in adjacent bushland, trampling of bushland during recreation activities, cropping vegetation for views and modification of adjacent bushland to give the impression of more expansive gardens.

EIS reference: Volume 4, Section 4.1.1.6

Submitter reference: 1/52

Wet Tropics Management Authority (50)

Proponent response

Buffers through physical setbacks have been established to mitigate potential cumulative impacts and urban edge effects. There is a vegetated buffer of about 300 m to the National Park and World Heritage Area and will be retained on the northern boundary. Improvements to the Master Plan allow for the golf course to be located along the northern boundary providing a further buffer from urban areas.

The Welcome Centre and associated community education program (for further detail refer to Section 2.2.3) will increase resident and visitor awareness of the significant surrounding ecosystems and the responsibilities of individuals within these sensitive environments. By establishing a high level of environmental awareness within the community, urban permeation effects including vegetation dumping in adjacent bushland, trampling of bushland during recreation activities, cropping vegetation for views, and modification of adjacent bushland will be minimised.

Furthermore, in addition to simply restoring corridors and enhancing the coastal vegetation asset, it is recognised that much degradation of natural vegetation adjacent to development areas comes from the risk of garden escapees from formal landscaping and individual backyards. The proponent seeks to go above its regulatory offset requirements by focusing on the use of endemic/local biodiversity in its formal landscape and golf course development program. This will enhance the biodiversity values of the entire Ella Bay site. The Principles for Design and Living at Ella Bay (see Volume 2, Section 2.6.2) will enforce people to use local native vegetation within landscaped areas and avoid potential environmental pest species.

1.2.7.5 Offsets

Submitters were generally supportive of offset measures, however only minimal detail provided by the proponent about these offset measures, i.e. how and where it would occur. There were concerns that off-setting Cassowary impacts via buying or revegetating off-site land may not be effective due to the local scale of development impacts (offset measures are only realistic if they occur within the range of local Cassowary populations). Any offsetting of 'of concern' vegetation needs to be done in accordance with Department of Natural Resources and Water's offsets policy.

EIS reference: Volume 3, Section 3.4.3

Submitter reference: 2/52

Department of Natural Resources and Water (42), Department of Environment and Water Resources (51)

Proponent response

A draft *Integrated Package for Regulated Offsets and Additional Environmental Investments* has been developed and is currently under negotiation with government agencies, and the *Improved Natural Environment* (see Volume 2, Section 2.2.9) has been prepared with consideration to these concerns. Further details of Cassowary management measures in relation to submission response can also be found in Section 1.3.

1.2.7.6 Fencing Offsets

The proposed Cassowary fences will require vegetation offsetting in some places and may require approvals depending on the location and extent of proposed clearing to enable construction of the fences.

EIS reference: Volume 4, Section 4.7.1.2

Submitter reference: 1/52

Department of Natural Resources and Water (42)

Proponent response

The vegetation removal required as a result of the implementation of the proposed cassowary fencing is expected to be negligible, with the majority of fencing now located around smaller urban precincts away from remnant vegetation (see figure 1.2.17). It is therefore unlikely that vegetation offsetting for fences will be required.



Figure 1.2.17: Fencing and barrier plan (Volume 3, Section 3.1)

1.2.8 Submitter Issue: Weed Management

1.2.8.1 Weed Management Plan

An on-going program of weed management is required. The EIS should provide a Weed Management Plan that addresses all stages of the development, from commencement of the project. The impact of the removal of cattle on weed infestation should be included in weed management strategies.

EIS reference: Volume 4, Section 4.7.1.1.3

Submitter reference: 2/52

Department of Primary Industries and Fisheries (43), Department of Environment and Water Resources (51)

Proponent response

The subject site in its current state is predominantly cleared land which is generally degraded with significant areas of exotic weed infestations within paddocks of introduced pasture grass. A long-term Weed Management Plan is to be prepared at the operational works phase and will address all key concerns regarding weed management strategies, eradication strategies and impact mitigation strategies in conjunction with Terrain Natural Resource Management (refer to Volume 4, Appendix A.2.11).

The construction of the golf course will also reduce a significant amount of weeds. The effective management of weeds will likely lead to a net positive impact and may help prevent the current risk of weed infestation into the National Park.

1.2.8.2 Weed Eradication Methods

Pond apple is widespread, forming particularly dense infestations in riparian and aquatic areas. Mechanical control (chain pulling, dozer pushing) is not recommended in areas with sensitive and/or native vegetation or on erosion prone soils. Chemical treatment by stem injection or the 'cut stump' method is considered more appropriate than foliar or basal bark treatments, in particular in aquatic or sensitive environments.

EIS reference: Volume 4, Section 4.7.1.1.3

Submitter reference: 16/52

E Bock, (11) Performa letter (15 submissions) (17,22-35)

Proponent response

The rehabilitation plan (refer to Volume 3, Section 3.1) outlines onsite areas proposed for rehabilitation. A Weed Management Plan will be developed at the operational works phase as a feature of the Terrain NRM/Degrees Celsius partnership and will include detailed weed management strategies, eradication strategies and impact mitigation strategies.

The vegetation study conducted by BAAM in 2006 shows that even some of the Endangered Ecosystem shown on the Regional Ecosystem Map is actually of poor quality, and requires removal of weeds, particularly Pond Apple, *Annona glabra*. The Ella Bay proposal plans to assist this rehabilitation with active resources input for a period of time until it is in good condition.

The majority of weeds presently on the site exist within open grassland and weeds in these areas are to be removed and replaced with native species that will form scattered rainforest and the golf course and community open space.

All declared weed species currently exploited by Cassowaries (as an agent of weed spread) such as pond apple, *Annona glabra*, will be removed from the property in a weed control program, and replaced by native species, including Cassowaries preferred food trees at strategic locations.

No mechanical control (chain pulling, dozer pushing) will be conducted in the any clearing of weeds and only appropriate chemical treatment that is conducive to the sensitive surrounding environment will be used.

1.2.9 Submitter Issue: Barriers, Buffers and Setbacks

1.2.9.1 Waterway Barriers and Riparian Vegetation.

Waterway barrier works approvals not addressed in the EIS and is requested the by Terms of Reference. Approvals may be required for temporary waterway barriers.

It is required that riparian vegetation be retained and subsequently provide maintenance of existing fish habitats in accordance with recommendation F.25.

EIS reference: Volume 5, Section 5.4.7.2.4

Submitter reference: 1/52

Department of Primary Industries and Fisheries (43)

Proponent response

At this stage, it is not expected that waterway barrier works, including temporary water barriers, will be required for the development, and so approvals for such works have not been obtained. However, if it becomes necessary at a later stage to implement temporary waterway barriers, appropriate avenues will be pursued to obtain the correct permits.

Volume 5 of the EIS provided the following impact mitigation measures as recommended in the *Flora and Fauna Impact Assessment Report* prepared by BAAM in February 2007:

Recommendation F.25: The current proposed footprint indicates existing corridors following watercourses will be mostly retained. It is recommended that all riparian vegetation is retained, and that the corridors are at least 50 m width either side of the high bank of the creeklines. In some areas this will require rehabilitation to broaden the corridor. The proponent proposes to significantly widen the corridors subject to negotiation with Department NRW.

All riparian vegetation along water courses is to be retained and rehabilitated as shown on the rehabilitation plan (see figure 1.2.18). It is proposed that the main east–west and north–south riparian corridors will have setbacks spanning approximately 100 m (approximately 50 m setback from each side of the watercourse). Other minor watercourses will have setbacks of 25 m from the high bank lines, amounting to a minimum width of 50 m. Ongoing rehabilitation, monitoring and maintenance of these corridors is proposed to occur. The proposed watercourse buffer widths can be identified in figure 1.2.19.

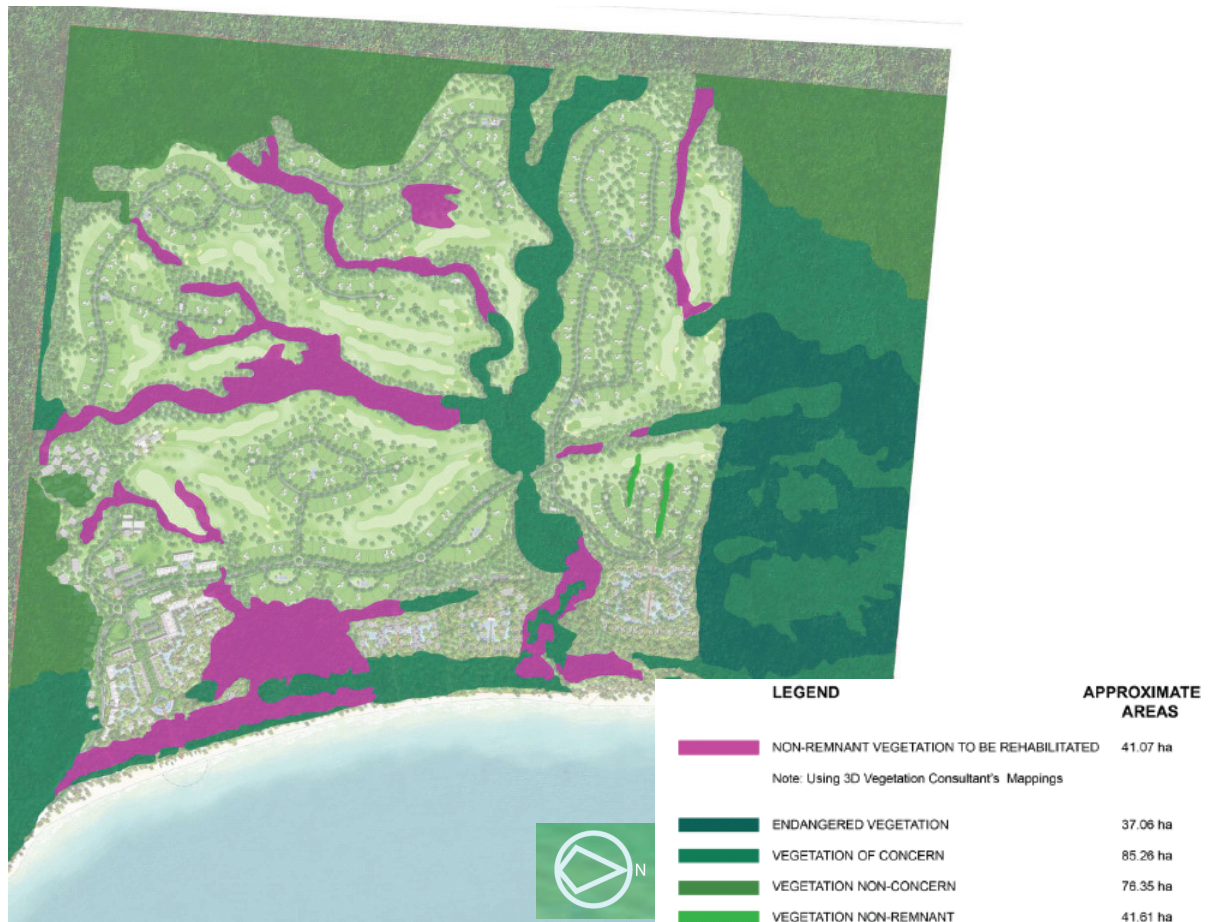


Figure 1.2.18: Rehabilitation of non-remnant vegetation (Volume 3, Section 3.1)

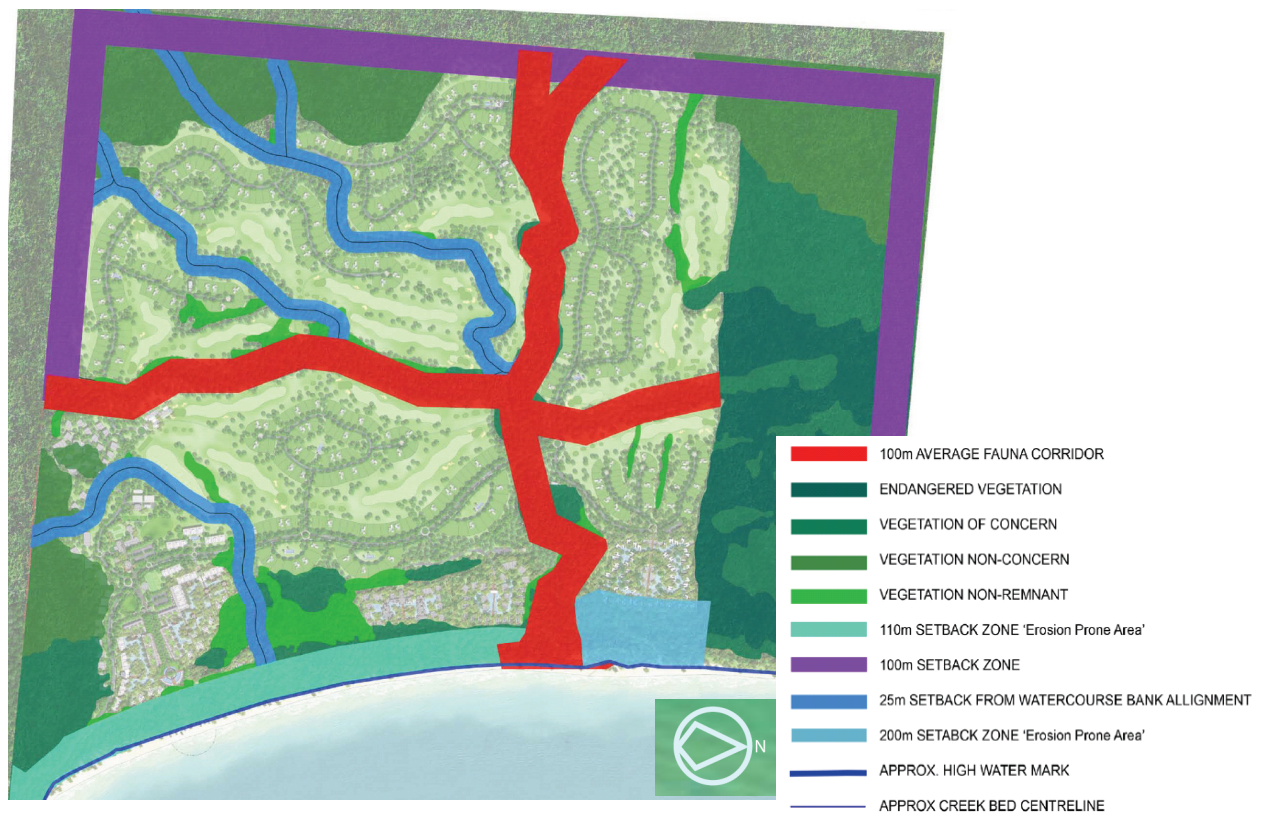


Figure 1.2.19: Water corridor buffers are identified in blue and red (Volume 3, Section 3.1)

1.2.9.2 Construction Buffers

Construction works should incorporate the provision of adequate buffers to protect existing marine plant communities.

EIS reference: Volume 5, Section 5.4.7.2.4

Submitter reference: 1/52

Department of Primary Industries and Fisheries (43)

Proponent response

All appropriate regulations will be met at the operational works stage, to ensure minimal environmental disturbance.

Volume 5 of the EIS provided the following impact mitigation measures as recommended in the *Flora and Fauna Impact Assessment Report* prepared by BAAM in February 2007:

Recommendation V6: Once appropriate buffer distances have been established, the Concept Master Plan can be revised to avoid buffer areas. These buffer areas can incorporate fences and roads.

Recommendation V7: A Construction Vegetation Management Plan is prepared to ensure that retained vegetation is protected from construction impacts.

These will be implemented with the additional recommendation, that construction works will incorporate the provisions of adequate buffers to protect existing marine plant communities. The definition of adequate buffers will be determined in cooperation with the Department of Primary Industries and Fisheries during construction phases.

1.2.9.3 Setbacks

Delineate appropriate setbacks (ideally of 50 m width) for development from national park and/or existing remnant vegetation boundaries (the map titled 'New open woodland plan' from the EIS demonstrates that a buffer to existing vegetation has been incorporated for most areas proposed for development, however the setbacks and areas involved should be quantified). Describe the rehabilitation program proposed to be applied within those buffers. Ideally those areas would be planted with rainforest species endemic to the area rather than be maintained as mowed or open woodland areas.

EIS reference: Volume 3, Section 3.4.2

Submitter reference: 1/52

Environmental Protection Agency (45)

Proponent response

A minimum 50 m setback zone has been proposed from the north, west and south boundaries of the Site. A vegetated buffer of about 300 m is to be retained on the northern boundary adjacent to the Ella Bay National Park, and an extensive and irregular natural buffer is to be retained along the National Park Boundary in the south and west. These have been identified in the site analysis map (figure 1.2.20).

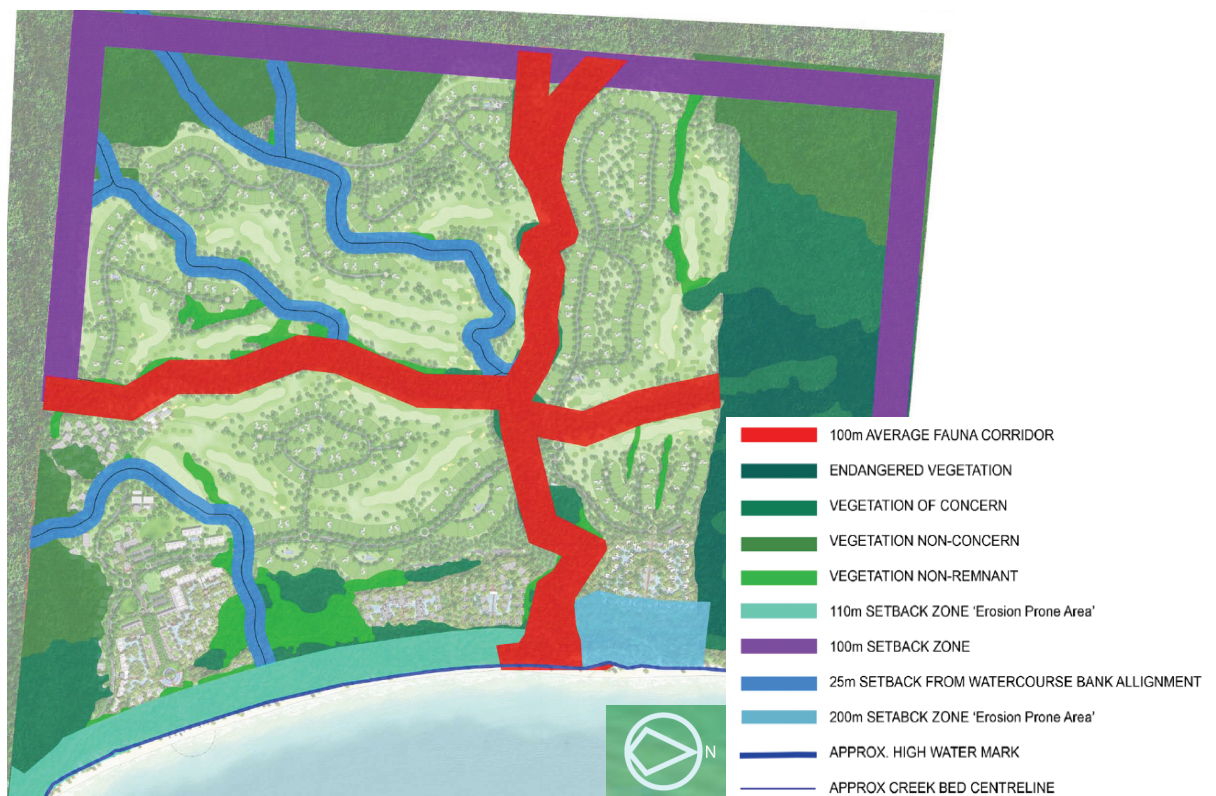


Figure 1.2.20: Water corridor buffers are identified in blue and red (Volume 3, Section 3.1)

Figure 1.2.21 below provides a plan of the proposed development, which indicatively shows how built form will be setback from surrounding vegetation by revegetation areas.



Figure 1.2.21: Plan indicating revegetated areas (Volume 3, Section 3.1)

The previous Master Plan displayed in the EIS has been adapted to create a large new buffer zone in the north of the site. This is achieved by using parts of the golf course as a the buffer itself by altering the Master Plan—moving dwellings away from the Ella Bay wetland and predominantly outside of its catchment area. This will enable a better coastal management outcome and provide an additional buffer to the creek immediately behind the foreshore area. At least three holes (those that border the northern perimeter of the proposed development) will be organic and not use any artificial fertilisers or chemical treatments. This will assist in reducing any potentially damaging ground or storm water run-offs to the swamp area.

Wherever possible, and for the majority of the proposed development, it is proposed that the revegetated buffers will be planted with rainforest species endemic to the area.

It is proposed that Terrain NRM's Landscape Rehabilitation Unit will oversee the delivery of the significant rehabilitation activities as well as enhancement and maintenance of the biodiversity values in

the coastal zone. This work will be carried out in partnership with the Johnstone Shire Council's rehabilitation nursery, and local traditional owners. Underpinning this initiative would be a 10 year Weed Management Plan of all revegetated areas, a focus on the use of endemic local species and a ban on planting exotic species within revegetated areas.

1.2.9.4 Setback from Foreshore Regional Ecosystem

The EIS indicates that the resorts will be located behind the foredune. The resorts are located in close proximity to the endangered Regional Ecosystems (RE's) (north-eastern and central foreshore). The buffers appear to be only 20 m, and the footprint appears to exceed the buffer and enter these sensitive environs. It seems that the high density of people in the most sensitive environments is not well planned.

EIS reference: Volume 3, Section 3.4.2

Submitter reference: 1/52

Department of the Environment and Water Resources (51)

Proponent response

'Endangered' Regional Ecosystems are limited to the north of the development area. Figure 1.2.22 indicates the location of these regional ecosystems (darkest green) and also shows that the central foreshore vegetation does not contain 'endangered' Regional Ecosystems. This area has undergone a ground-truth process to ensure accuracy in vegetation mapping, therefore existing Regional Ecosystem mapping will require alterations. The resorts will be appropriately setback from vegetation to mitigate potential edge effects and access to the beach will be restricted to designated pathways (see figure 1.2.24).



Figure 1.2.22: Current status of vegetation (Volume 3, Section 3.1)

In consideration of the findings of the Erosion Prone Area Reassessment (see Volume 4, Appendix A.2.8) the resorts are to have a minimum setback of 220 m from the foreshore north of the main creek entrance and 110 m minimum setback from the foreshore south of the creek (refer to figure 1.2.23). This will provide an additional buffer for sensitive foreshore ecosystems.

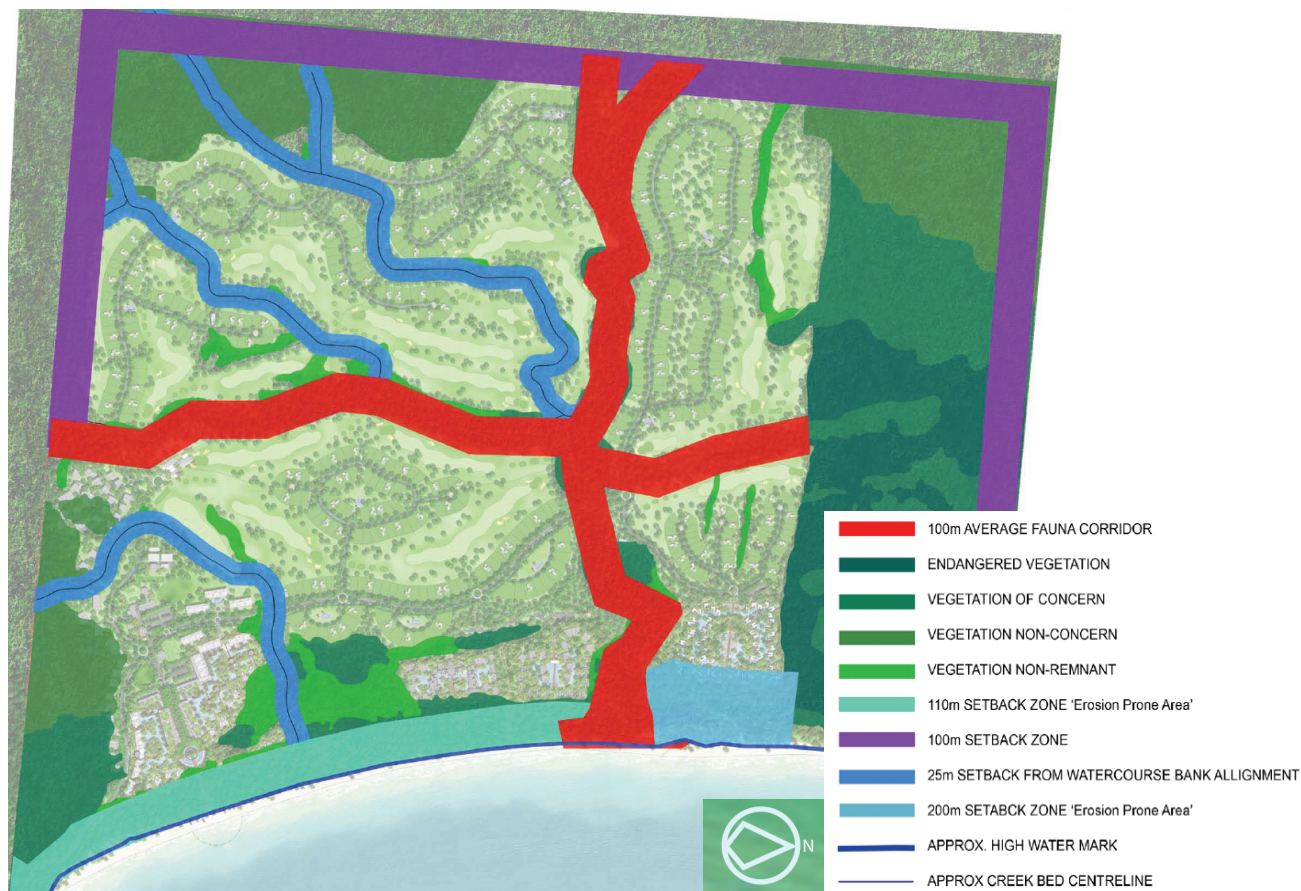


Figure 1.2.23: Master Plan with the set back zone is indicated along the foreshore (Volume 3, Section 3.1)

In addition, the previous Master Plan displayed in the EIS has been adapted to create a large new buffer zone in the north-east corner of the site, providing a buffer to further protect these sensitive coastal environs. This is achieved by using parts of the golf course as a the buffer itself and altering the Master Plan by moving residents away from the Ella Bay Wetland and out of its catchment area.

This will enable better coastal and water quality management outcomes. Three holes of the golf course will be located in this buffer that borders the northern perimeter of the development area. These holes will be organic and not use any artificial fertilisers or chemical treatments. This will assist in reducing any potentially damaging groundwater or storm water run-offs to the wetland area and endangered Regional Ecosystems.



Figure 1.2.24: Plan indicating limited access points to the beach (Volume 3, Section 3.1)

1.2.9.5 Conservation Buffers

It is considered that buffers adjacent to 'endangered' or 'of concern' regional ecosystems should be at least 100 m wide to filter the effects of urban disturbance.

EIS reference: Volume 3, Section 3.4.2 & Volume 4, Section 4.7.1

Submitter reference: 1/52

Wet Tropics Management Authority (50)

Proponent response

It is proposed that 'endangered' and 'of concern' vegetation will be provided with appropriate buffers to filter the effects of urban disturbance. However, in some areas the built form will be located adjacent to 'endangered' and 'of concern' vegetation with a buffer zone less than 100 m. The plan below indicates revegetation areas (in orange) that will act as buffer zones for existing vegetation.



Figure 1.2.25: Plan indicating revegetated areas that will act as a vegetated buffer zone (Volume 3, Section 3.1)

1.2.10 Submitter Issue: Additional Issues

1.2.10.1 Conservation Covenants

Provide estimates of the area of wildlife corridors and other areas proposed to be subject to Conservation Covenants, and the enabling legislation proposed. Success of Conservation Covenants protecting landscape characteristics and vegetation communities over time is questioned.

EIS reference: Volume 3, Section 3.4.4 & Section 3.2.1

Submitter reference: 2/52

Environmental Protection Agency (45), Wet Tropics Management Authority (50)

Proponent response

It is intended that long term, rehabilitated areas will be converted to Conservation Covenants under the Johnstone Shire Council or nature refuges under the *Nature Conservation Act 1992* or other protection tenures under the Ella Bay Local Area Plan. The total area to be subject to conservation covenant is estimated to be around 60.43 hectares. The area is indicatively shown in the following figure.



Figure 1.2.26: Area to be subject to conservation covenant (Volume 3, Section 3.1)

The Offsets Policy requires that the regulated offsets be legally secured, by Conservation Covenant or similar security. The Ella Bay Integrated Resort Proposal plans to go significantly beyond the required legally secured offsets, by increasing the area protected under Conservation Covenants, as well as offering a large area of forest to the National Park to become part of Ella Bay National Park. An example of a covenant is provided in the EIS.

The protection of revegetated rainforest corridors would be ensured with their proposed designation as conservation precincts under binding conservation covenants. Underpinning this initiative would be a 10 year Weed Management Plan of all revegetated areas, a focus on the use of endemic local species and a ban on planting exotic species within revegetated areas.

Particular attention would also be given to enhancing biodiversity in the coastal zone vegetation within the Ella Bay site. This feature is a particularly critical natural asset within the development site and requires careful management and enhancement.

The proponent recognises that to achieve its sustainability goals, serious consideration needs to be given to establishing sound social governance processes within the emerging new community. This will be particularly critical in ensuring long-term commitment to covenant requirements, and continuous improvement in the environmental performance of this new community. The Proponent intends to invest in partnership with the university sector to establish a research program to explore and monitor the effective implementation of best practice community governance for sustainability outcomes in the Ella Bay community.

1.2.10.2 Modification of EIS Recommendations

Recommendation V15: Should include: d) The periods throughout the year when the Ella Bay wetland is connected to the streams on the site, and to what extent these flows are utilised by migrating fish species.

Recommendation A1: add fish to survey

Recommendation F7: add to the recommendation reference to 'consult Department of Primary Industries and Fisheries' about requirements for waterway barriers either during construction or operation of the development.

EIS reference: Volume 5, Section 5.4.7.2.4

Submitter reference: 1/52

Department of Primary Industries and Fisheries (43)

Proponent response

The following issues raised by public submitters relate to the recommendation provided by BAAM in Volume 5 of the Environmental Impacts Statement. The suggested modifications have been considered in previous responses and are as follows.

Recommendation V15: The periods throughout the year when the Ella Bay wetland is connected to the streams on the site, and to what extent these flows are utilised by migrating fish species.

Recommendation A1: add fish to survey

While research into the relationship between the relevant portion of the development site and the wetlands for aquatic species is necessary for planning and monitoring purposes, planning at this stage will ensure the complete protection and enhancement of the subject drainage lines and water quality and quantity leaving the site and entering the wetland (refer to Volume 4, Appendix A.2.3 (*Consultant Submission Response*, BAMM)).

BAAM recommended that further freshwater fish surveys could be conducted to improve knowledge of species present and their habitat requirements for rehabilitation purposes. As a condition of approval, further aquatic vertebrate data collection and long term monitoring of water health could be undertaken.

Recommendation F7: The Department of Primary Industries and Fisheries should be consulted about requirements for waterway barriers either during construction or operation of the development.

The Department of Primary Industries and Fisheries will be consulted about requirements for waterway barriers either during construction or operation of the development where required.

1.2.10.3 Area to be Allocated to National Park

Provide estimates of the areas proposed to be gifted to the State as extensions to the Ella Bay National Park.

EIS reference: Volume 4, Section 4.1.1.6

Submitter reference: 1/52

Environmental Protection Agency (45)

Proponent response

It is proposed that proponent will offer large area of forest to the State to become part of Ella Bay National Park. The exact figure is subject to offset arrangements and details and negotiations. However the proposed area is likely to be approximately 130 hectares and handed over to National Parks over a five year period.



Figure 1.2.27: Area to be allocated as national park (Volume 3, Section 3.1)

1.2.10.4 Operational Works Approvals

Fisheries development approvals for the protection of marine plants was not addressed in the EIS. Any proposal to disturb/clear the non-remnant/secondary community dominated by *Hibiscus tiliaceus* in the dune swales and swampy flats behind the coastal foredune to allow access pathways to the beach will require Operational Works approval for disturbance to *Dendrobium mireblianum/superbiens* (mangrove orchid). Foreshore beautification works at Flying Fish Point may also require an Operational Works approval.

The pathways to the beach require assessment because they traverse beach esplanade. Accordingly, approvals will be required as the construction of these pathways involves disturbance of coastal vegetation.

EIS reference: Volume 3, Section 3.4.2 & Section 3.2.2

Submitter reference: 2/52

Department of Primary Industries and Fisheries (43), Department of Natural Resources and Water (42)

Proponent response

All Department of Primary Industries and Fisheries and Department of Natural Resources and Water works approvals for the protection of marine plants and foreshore/coastal vegetation will be addressed during the detailed design and operational works stages of development.

Appropriate measures will be taken to obtain Operation Works approvals should there be a requirement to disturb or clear the non-remnant/secondary community dominated by *Hibiscus tiliaceus* in the dune swales and swampy flats behind the coastal foredune to allow access pathways or boardwalks to the beach. This will be established during the operational works stage of development. It should also be acknowledged that a limited number of beach access pathways are proposed (see figure 1.2.26).

Foreshore beautification works at Flying Fish Point are no longer proposed, as the currently proposed access road does not pass through Flying Fish Point.

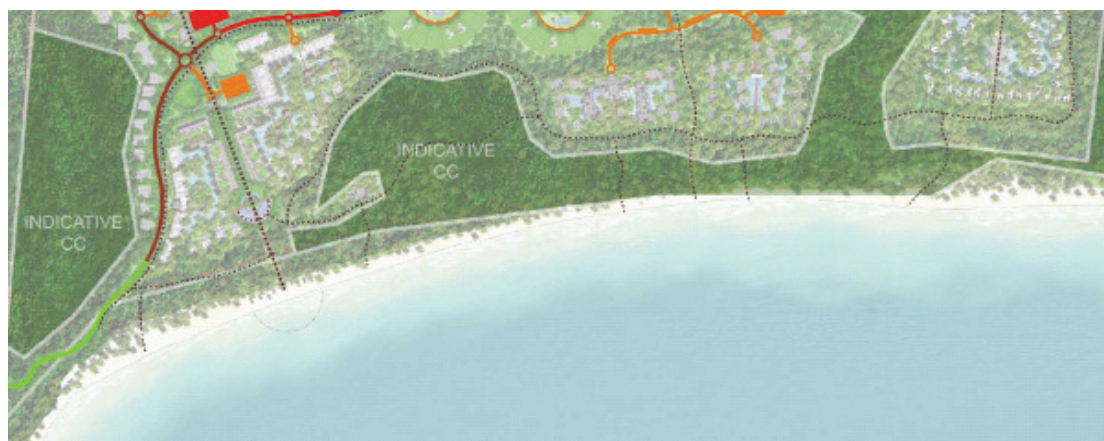


Figure 1.2.28: Plan indicating limited access points to the beach (Volume 3, Section 3.1)

1.2.10.5 Vermin Management Plan

The Vermin Management Plan could be expanded to include monitoring and/or control of mosquito breeding sites within the application area. The incorporation of an adult mosquito monitoring program could be used to provide updates to community whenever populations of disease vectors escalate.

EIS reference: Volume 3, Section 3.5.5.6

Submitter reference: 1/52

Queensland Health (44)

Proponent response

An extensive Mosquito Management Plan (Vector Management Plan) has been prepared separately to the Vermin Management Plan, and be accessed in Volume 4, Appendix A.2.13. This plan includes monitoring and control of mosquito breeding sites within the proposed development, as well as a risk assessment. An adult mosquito monitoring program has been incorporated, with active components of the Mosquito Management Operational Plan including advice to guests and treated barriers to be activated in a timely fashion by monitoring for changes in mosquito populations on the site. A number of parameters will be monitored including:

- seasonality relative to mosquitoes (generally Oct – May);
- Site rainfall likely to result in increased mosquito breeding;
- regional weather (rain and winds) likely to influence the regional abundance and dispersal of mosquitoes;
- mosquito breeding in ground pools; and
- adult mosquito specimens collected in light traps at standard locations within the development.