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Appendix A: Conservation Reserves in the Elanora-Palm Beach Management Cluster .................................................................120
Executive summary

The intent of this plan is to guide the protection, management and enhancement of Council’s conservation estate within the Elanora-Palm Beach area. This area contains a significant recreational network, including beaches, waterways, sports ovals, family parks, horse riding clubs and conservation reserves, with a close integration between conservation reserves and active recreation areas that allows park users to walk, play and ride in a bushland setting. This management plan is written in the context of maintaining an integrated and connected recreational network, with a primary focus on providing a strategic framework for the management of those reserves, or parts of reserves, that are managed for conservation purposes.

The area covered by this plan (referred to herein as the Elanora-Palm Beach conservation reserves management cluster, or the planning area), contains 26 parks, which are managed either partially or wholly for conservation purposes (Figure 1). Parks managed entirely for conservation purposes (including nature-based recreation) include Elanora Conservation Area, Simpsons Road Conservation Area and Simpsons Road Reserve. Other major parks in the planning area, including Schusters Park, Eddie Komhauser Recreational Reserve and Merv Craig Recreational Park, contain playgrounds, horse-riding arenas, sports ovals and large mown areas, interspersed with stands of remnant vegetation. This plan only addresses the management of the vegetated areas within these parks. Management strategies given in Section four of this plan relate only to conservation zones and not to other areas formally designated for active and/or passive recreation. The strategic planning and operations of formal active recreation zones are guided by master plans and associated master plan reports (where available); park maintenance service reports and service level agreements; reserve land management plans for those sites with secondary use and that involve leased areas; and Council’s Priority Infrastructure Plan.

The planning area is an important community resource, contributing to the health and lifestyle of residents by providing green spaces for daily exercise, scenic amenity and an opportunity to get close to nature - Elanora is one of the few suburbs in the region where residents can still encounter koalas in their own back yard. Recreational activities undertaken in the reserves include picnicking, walking, jogging, nature appreciation, horse riding, kayaking and fishing. The reserves are prominent natural elements in the southern Gold Coast and enhance the city’s visual amenity. The coastal and riparian parks protect spectacular view corridors where the Gold Coast and Pacific Highways cross Tallebudgera and Currumbin Creeks, while the hinterland reserves protect prominent ridgelines that contribute to the green backdrop of the City.

The planning area provides habitat for rare or threatened animals including the koala, powerful owl, glossy black cockatoo, little tern and grey-headed flying fox and for at least five rare or threatened native plants. The high habitat value can be attributed to the presence of thirteen distinct vegetation types (regional ecosystems), two of which are endangered in Queensland. Coastal and riparian reserves along Tallebudgera and Currumbin Creeks contain coastal and riverine ecosystems (including mangrove, saltmarsh and gallery rainforest) that are not widely represented in the landscape. The reserves also contribute to two significant ecological corridors, that enable native wildlife to move between coastal and hinterland habitats according to seasonal requirements. The Elanora-Palm Beach conservation reserves protect extensive sections of Tallebudgera and Currumbin Creeks, thus contributing to the preservation of catchment values including water quality, erosion protection, flood mitigation and recreational amenity.

The main threats to the planning area are those associated with urbanisation and small reserve size including weed invasion, wildlife disturbance by people and domestic animals,
limited habitat availability and reduced connectivity. These and other threatening processes place considerable pressure on ecological and amenity values.

The Elanora-Palm Beach Conservation Reserves Management Plan aims to protect and enhance the values of the planning area in perpetuity, through providing strategies for the management of threatening processes and encouraging sustainable community use and appreciation. Ecosystem restoration and the protection of biodiversity, landscape, recreational, catchment and cultural heritage values are the primary objectives of this plan. Management strategies presented herein are based on sound scientific information; their effectiveness will be gauged by monitoring ecosystem condition and management action outcomes.

The plan outlines park restoration activities, priorities for threatened species management, pest and bushfire management requirements, infrastructure maintenance and upgrade requirements and opportunities for recreation, community involvement and education. Improvements proposed for nature-based recreation activities in the area include track upgrades to facilitate access and connectivity between parks and development of interpretive nature trails at Schusters Park, Elanora Wetlands Reserve, Eddie Kornhauser Recreational Reserve, Tarrabora Reserve and Beree-Badalla Reserve.

The plan has been developed in consultation with the Gold Coast community and key Council stakeholders, through a two-stage consultation process. Community feedback indicated widespread support for Council’s green spaces, and a key element of this plan is to use the reserve network and associated conservation programs to promote community interest in and understanding of the City’s environmental values and to facilitate opportunities for residents to enjoy and benefit from the city’s protected area estate.
Acronyms frequently used in this management plan

BMP: Bushfire Management Plan

CAMBA: China and Australia Migratory Bird Agreement

DAFF: Queensland Department of Agriculture, Fisheries and Forestry

DECC: NSW Department of Environment

DNPRSR: Queensland Department of National Parks, Recreation, Sport and Racing

DSITIA: Queensland Department of Science, Information Technology, Innovation and the Arts

DTMR: Queensland Department of Transport and Main Roads

EPBC Act: Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

GCCC: Gold Coast City Council

IMP: Interim Management Plan

JAMBA: Japan and Australia Migratory Bird Agreement

LAP: Local Area Plan

NAMU: Natural Areas Management Unit (Gold Coast City Council)

NC Act: Queensland *Nature Conservation Act 1992*

NCWR: Queensland *Nature Conservation (Wildlife) Regulation 2006*

NPWS: New South Wales Parks and Wildlife Service

OSPL: Open Space Preservation Levy

PACP: Pest Animal Control Plan

SPA: Queensland *Sustainable Planning Act 2009*

QFRS: Queensland Fire and Rescue Service

QPWS: Queensland Parks and Wildlife Service

QF: Queensland Fisheries (A section of DAFF)

QR: Queensland Rail

RE: Regional Ecosystem

ROKAMBA: Republic of Korea-Australia Migratory Bird Agreement

VM Act: Queensland *Vegetation Management Act 1999*

Note: all names of organisations listed are current at the date of adoption of this plan.
1 Introduction

1.1 Management vision

A resilient reserve network that protects the scenic, ecological and heritage values of lowland coastal ecosystems and provides a connected recreational network for the community.

1.2 Plan Development and implementation

1.2.1 Methodology and overview

For planning purposes, Gold Coast City Council’s (Council’s) conservation estate has been subdivided into 19 ‘management clusters’, which comprise groups of reserves that are geographically and ecologically related. Management cluster boundaries are generally defined by prominent physical features including ridgelines, waterways and roads.

This plan of management provides the strategic framework that governs the development and delivery of all management programs and actions affecting reserves, or parts of reserves, in the Elanora-Palm Beach management cluster that are managed primarily for conservation. The plan lists future management activities and uses (whether temporary or permanent) to be permitted within the planning area (subject to legislative and planning scheme approvals). Where other uses, activities and/or an increase in the scale of the permitted use are proposed subsequent to this plan, they will require full review and assessment by Council. If the review deems that the proposal will likely result in substantive variation to current management strategies, a formal amendment to the management plan will be required, including public consultation and adoption of the amended plan by Council. Uses, activities and increases in scale that are not in accordance with the specific management objectives (section 3.2) for the planning area and the management strategies given in Chapter 4, may be supported where an environmental benefit is demonstrated and the proposal will lead to an increase in the community’s understanding and appreciation of the environment.

A process of site assessment, stakeholder consultation and literature review has been used to identify existing issues, values and infrastructure in the planning area. Stakeholders include Council staff, relevant state government departments and the residents of Gold Coast City. Community consultation included a preliminary phase of information gathering via a ‘have your say’ flyer and feedback form sent to residents in the area, prior to plan development. The second phase of community consultation (i.e. issuance of this draft plan) allows the public to comment on the draft management plan prior to finalisation and adoption by Council.

Background information about the planning area, including the location, regional context and natural, cultural and social values of the reserve network is summarised in Chapter 2. The legislative and policy framework for the management plan, at a local, state and national level, is summarised in 3.1 and underpins the specific management objectives listed in 3.2.

Chapter 4 is subdivided into 17 themes relating to specific management values (e.g. flora, fauna, heritage), issues (e.g. fire, pest species, access) and opportunities (e.g. restoration, recreation, education and research) within the planning area. For each theme the current management situation is presented, summarising the existing condition, management initiatives, management needs and threats. On the basis of key desired outcomes arising from the current management situation, a detailed management strategy for each theme is
presented, comprising specific actions and guidelines required to achieve the desired outcomes. Management guidelines (standard directions) and actions (key operations) relate only to conservation zones and not to other areas formally designated for active recreation. Guidelines and actions are intended to be sufficiently robust to facilitate sustainable natural resource management over the long term, whilst incorporating enough flexibility to adapt management to meet changing operational demands and advances in scientific understanding as required. Key monitoring priorities to assess the effectiveness of management actions and guidelines are provided, to assist with future review of the management plan.

Chapter 5 provides a prioritised summary of management actions for the cluster. This information is used within the NAMU Operational Framework Plan to determine operational work programs.

1.2.2 Implementation

Council’s Natural Areas Management Unit (NAMU) will undertake day-to-day management of the reserves and will coordinate the implementation of this plan of management. In addition, contractors and other Council staff will be responsible for the implementation of some management strategies.

Management guidelines and actions detailed in this plan will be carried out within the annual action plan and works program of Council, subject to the availability of funding, staff and regional priorities. It is important that all persons working within the planning area are familiar with the parts of this plan relevant to their responsibilities when working within sensitive natural areas. NAMU sections (e.g. Operations and Restorations) are responsible for ensuring that relevant actions and guidelines from this plan are incorporated into contractor specifications for works that are to be conducted within the Elanora-Palm Beach Conservation Reserves.

For implementation of this management plan to be effective, there must be a regular and reliable flow of resources for ongoing management requirements and to fund new capital works programs. As annual action plans and works programs are developed in more detail and the exact resource requirements are identified, these projects can be resourced accordingly.

For effective delivery of this plan of management, it is important that council staff, councillors and contractors consult regularly to ensure consistency with management objectives and strategies. Community endorsement is also critical for the effective implementation of this plan and public stakeholder input has been, and continues to be, an important part of plan development. As well as responding to existing public concerns, the plan provides guidelines to facilitate future public involvement and support. A review of the plan of management will be undertaken by Council within ten years from the date of approval.
Figure 1. Conservation Reserves in the Elanora-Palm Beach Management Cluster
2 Background

2.1 Location and planning area

The planning area is located in the southern section of the Gold Coast, bounded by Tallebudgera Creek in the north, Currumbin Creek in the south, Tallebudgera Connection Road in the west and the coastal foreshore areas from Tallebudgera Creek to Currumbin Creek in the east, and encompassing the suburbs of Tallebudgera, Palm Beach, Elanora, Currumbin Waters and Currumbin Valley.

The Elanora-Palm Beach management cluster includes 26 reserves, which are managed either partially or wholly for conservation purposes. This plan is specifically focussed on the sections of these reserves that are managed for conservation purposes (referred to herein as the planning area). The plan does not address management of adjacent formal recreation areas, for example in Schusters Park and Eddie Kornhauser Recreational Reserve. However, a key feature of the planning area is the close integration between conservation and active recreation areas, and active recreation zones are discussed in the context of recreation and infrastructure planning within designated conservation areas.

Conservation zones within these 26 reserves in the planning area amount to approximately 185 ha in area, ranging from the large areas of remnant eucalypt forest in Simpsons Road Reserve and Elanora Conservation Area, to smaller bushland fragments within Eddie Kornhauser Recreational Reserve and Schusters Park and degraded remnants at Elanora Oval and Wyara Park. Other prominent reserves within the planning area include parks along Currumbin Creek, such as Tarrabora Reserve and Beree-Badalla Reserve near the coast and Currumbin Waters Park and Merv Craig Recreational Park upstream. Elanora Wetlands Reserve, adjacent to Schusters Park, is a significant community resource, while smaller parks like Avocado park are important in maintaining walking connectivity for local residents. A summary of all reserves within the planning area is provided in Appendix A.

2.2 Regional context

Reserves in the planning area have been acquired through developer contributions, State Government trusteeship and Council purchases to preserve ecological, aesthetic and recreational values. Reserves in the eastern, northern and southern sections of the management cluster are generally adjacent to Tallebudgera and Currumbin creeks and contain coastal (e.g. mangrove, saltmarsh, swamp oak open forest) or riverine ecosystems (e.g. Melaleuca forest, riverine rainforest) that are not widely represented in the local landscape.

Vegetation in the management cluster has been substantially cleared and fragmented due to agricultural and urban development, resulting in increased edge effects and reduced ecological function. However, the reserves continue to provide a green backdrop to the City and habitat for numerous rare and threatened species. For example, Elanora Conservation Area, Simpson Road Reserve (and others), support regionally significant koala (Phascolarctos cinereus) populations.

Although relatively small in size, the Elanora-Palm Beach reserves are among the most important conservation areas managed by Council in the urban landscape. Residential allotments adjacent to the western-most reserves are still relatively well vegetated, and native trees that have been retained in these lots are now integral to the habitat and connectivity provided by the planning area. Vegetation extending from Guineas Creek Road in the north to the intersection of Currumbin Creek Road and Tallebudgera Connection Road...
in the south is designated a “Substantial Remnant” under Council’s Nature Conservation Strategy (GCCC 2009a; refer to 3.1.2.4 below). Recent mapping analyses indicate that the Elanora substantial remnant spans an area of 741 hectares, 82% of which is of koala habitat value and 47% of which is remnant vegetation, dominated by the endangered RE 12.11.23 (Ecosure 2011).

The reserves in the western section of the planning area are visually prominent (due to their presence on ridgelines) and contribute to an important ecological corridor that provides habitat connectivity between near-coastal and hinterland habitats. This corridor is referred to as theCurrumbin to Currumbin Valley ecological corridor (the Currumbin Corridor). The Currumbin Corridor provides valuable links between Currumbin Headland through the Currumbin Valley to Springbrook and to the south through Tugun to the Cobaki Broadwater in Tweed Shire (Chenoweth 2010). Almost 92.7% (631.2 ha) of the Elanora substantial remnant overlaps with the Currumbin Bioregional Corridor. Such connectivity is rare not only within Gold Coast City, but within the South East Queensland region and the corridor plays a valuable role in maintaining Gold Coast City as one of the most biodiverse in Australia (Chenoweth 2006). In the Elanora-Palm Beach management cluster, the functionality of this corridor is compromised by the presence ofTallebudgera Creek Connection Road.

Nearly all of the remnant vegetation in the reserves is classified as of high (i.e. state level) ecological significance. The designation of high ecological significance for these areas highlights the considerable conservation value of these reserves.

2.3 Significance of the planning area

2.3.1 Natural values

2.3.1.1 Landscape and Geology

The landscape of the Elanora-Palm Beach management cluster is characterised by coastal foreshore areas in the east, the alluvial plains of Tallebudgera and Currumbin creeks and adjacent coastal foothills and ridgelines. Elevations range from sea level to 155 metres above mean sea level. The ridgeline directly north of Simpson Road Reserve, in the western section of the cluster, contains the highest point in the area and is a prominent landscape feature.

Outside the extent of the Tallebudgera and Currumbin creeks floodplains, geology of the planning area is dominated by: 1) metasediments of the Neranleigh-Fernvale Beds comprised of greywacke, argillite, quartzite, chert, shale, sandstone and greenstone, and 2) metamorphics of the Lamington Group and localised acid and basic volcanic intrusions. Parent material and soils of the floodplains are comprised of alluvium, clay, silt, sand and gravel (GHD 2004).

Geological units and associated soil types present in the reserves are summarised in Table 1.
Table 1. Geology units and associated soil types in the reserves

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<th>Associated Soil Types</th>
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<td>Flood plain alluvium: clay, silt, sand and gravel.</td>
<td>Mellic Brown Kandosol, Brown Dermosol, Mottled Grey Sodosol, Grey Dermosol, Yellow Kandosol, Brown Dermosol, Hydrosols, Rudosols: may include acid sulfate soils.</td>
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<td>Coastal plain - undifferentiated coastal plain deposits: mud and sand.</td>
<td>Arenic Rudosols: generally exhibit little or no colour or texture change with depth</td>
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<td>Alluvial terrace - lower level terrace, grades into flood plain: gravel, sand, silt and clay.</td>
<td>Grey Dermosol: grey soil, structured B2 horizons, lacks strong texture contrast.</td>
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<td>Beach ridges: quartz sand and shelly sand.</td>
<td>Arenic Rudosols: young siliceous soil.</td>
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<tr>
<td>Tidal flats: sand and mud.</td>
<td>Arenic Rudosols: young siliceous soil.</td>
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</tbody>
</table>

The underlying geology, soils and resultant topography has a large bearing on the diversity of vegetation types found within the reserves. The fertile soils derived from the weathering of basalt rock provide a suitable environment for the evolution of species-rich (e.g. rainforest/vine forest/wet sclerophyll) communities. Metasediments and/or metamorphosed mudstones produce unfertile, shallow clay-gravel soils more likely to support drier sclerophyll forests. Quaternary estuarine and/or marine deposits (sand and mud) support vegetation communities tolerant to permanent and periodic tidal inundation such as saltmarsh and mangroves.

2.3.1.2 Catchment

The planning area is located in the eastern sections of the Tallebudgera Creek and Currumbin Creek catchments. Both creeks flow from southwest to northeast through the management cluster with their headwaters located in the McPherson Range. Land use adjacent to the reserves is predominantly urban residential, with some public open space areas.

**Tallebudgera Creek Catchment**

The Tallebudgera Creek catchment occupies an area of 9,770 hectares and extends from the Springbrook plateau in the west, to the Pacific Ocean in the east. Tallebudgera Creek is approximately 27 kilometres in length; it flows from southeast to northwest and discharges to the ocean immediately south of Burleigh Headland.

The lower tidal sections of Tallebudgera Creek are vegetated with mangroves, saltmarsh and coastal forest (e.g. coast she-oak, melaleuca) communities. These vegetation communities often occur as narrow discontinuous patches and are severely threatened by weed invasion and adjacent land use activities (e.g. parks, urban development) (Australian Wetlands 2006). The section of creek immediately downstream of the Pacific Motorway (M1) bridge is managed by the Department of National Parks, Recreation, Sport and Racing (DNPRSR) as
a Conservation Park (Tallebudgera Creek Conservation Park) under the Queensland *Nature Conservation Act* 1992 (NC Act).

Riparian vegetation along the lower and middle freshwater reaches of Tallebudgera Creek has been extensively cleared for past land use practices. Narrow patches of forest red gum and river she-oak forest and rainforest remain in some areas. However, these areas generally exhibit poor condition and contain high densities of weed species such as camphor laurel (*Cinnamomum camphora*) (Australian Wetlands 2006). Scattered patches of rainforest, wet sclerophyll and river she-oak are also present in the upstream reaches of the creek. Weed encroachment is less severe in the upstream sections (25 to 40 percent cover) than in the downstream sections (greater than 60 percent cover); however, many of the pools contain high densities of aquatic weeds including cabomba (*Cabomba caroliniana*), elodea (*Elodea canadensis*) and salvinia (*Salvinia molesta*) (Australian Wetlands 2006). The middle and upper freshwater reaches contain areas of unstable bed and banks, particularly around the Petsch Creek confluence.

**Currumbin Creek Catchment**

The Currumbin Creek catchment extends from the Mt Cougal National Park and World Heritage listed Springbrook plateau in the west, to the headland of Currumbin Rocks and the Pacific Ocean in the east. Currumbin Creek is approximately 20 kilometres long and situated within a relatively narrow and steep-sided valley (GHD 2004). The creek drains a catchment area of approximately 6067 hectares (WBM 2002).

A long history of coastal development, associated clearing and channel dredging has significantly altered the in-stream and bank conditions of the estuary zone. Despite this, healthy seagrass (*Zostera capricorni*) beds remain present in the lower and upper estuarine reaches (GHD 2004). Estuarine habitats (*e.g.* sandy substrate, saltmarsh, mangroves) and the seagrass beds present in the lower (coastal) reaches of both creeks are important spawning areas for a variety of estuarine and saltwater fish species.

Terrestrial and riparian vegetation in the coastal plains and foothills section of the catchment (*e.g.* the Elanora-Palm Beach management cluster) has been substantially cleared. Remaining vegetation consists of both disturbed and undisturbed she-oak open forest, subtropical rainforest, wet sclerophyll forest, open woodland, remnant littoral rainforest, estuarine mangrove and saltmarsh communities. Although vegetated areas in this section of the catchment are in many cases small, narrow, discontinuous or substantially affected by weed species, they are of high value given that they represent some of the last remaining habitats for flora and fauna in this urban setting.

The middle reaches of Currumbin Creek have been substantially disturbed by sand and gravel quarrying and rural land use (*e.g.* cattle grazing). Many sections of the creek banks are experiencing mass failure and undercutting (GHD 2004). The western (*i.e.* upstream) sections of the catchment contain large tracts of vegetation that remain intact due the presence of steep slopes and mountainous areas.

Assessments conducted for the *Currumbin Creek Catchment Study* (GHD 2004) indicate that the riparian vegetation along the creek has been severely impacted by clearing practices associated with historical land use (primarily cattle grazing). Cattle access has been identified as a significant contributor to the degraded condition of riparian vegetation along the creek. Vegetation clearing along Currumbin Creek has resulted in negative impacts including reduced riparian connectivity, degraded vegetation and habitat conditions, and the establishment of weedy species.

Areas within Beree-Badalla Reserve (on Currumbin Creek) and the reach downstream from the Pacific Motorway (M1) bridge at Tallebudgera Creek are designated Fish Habitat Areas under the *Fisheries Act* 1994 (Fisheries Act). These areas provide important habitat for

**Wetlands**

Wetlands (e.g. Melaleuca forest, mangroves, saltmarsh) are present in Schusters Park, Eddie Kornhauser Recreational Reserve, Coastal Meadows Park, Currumbin Waters Park, Merv Craig Recreational Park, Beree Badalla Reserve and Tarrabora Reserve. Wetlands are unique features in the Eulanora-Palm Beach landscape that provide important ecological functions. By absorbing and slowly releasing floodwater, wetlands conserve water and provide buffer capacity against coastal erosion, storm surges and flooding. Wetlands often improve surface water quality by filtering out excess nutrients and sediment. In coastal settings, wetlands are important nursery areas for many fish and invertebrate (e.g. crustacean) species, and provide foraging habitat for migratory shorebirds.

2.3.1.3 Flora

The planning area conserves a diverse assemblage of native flora characteristic of the coastal plains and foothills of the South East Queensland Bioregion. Thirteen distinct regional ecosystem (RE) (vegetation) types are protected by the reserves includes variants of open dry eucalypt forest, tall wet eucalypt forest, rainforest, mangrove, saltmarsh, swamp oak open forest and paperbark forest (Table 2).

The number of different ecosystems present in an area is a broad indication of the area’s habitat diversity and the presence of natural processes that contribute to ongoing ecological function. The presence of 13 distinct RE’s in the planning area indicates that reserves are contributing to the protection of significant biological diversity. This is supported by Chenoweth’s (2005) finding that the majority of remnant vegetation within the planning area has state level conservation and biodiversity significance.

**Regional Ecosystems**

Vegetation communities in the management cluster have experienced substantial clearing, disturbance and fragmentation due to agricultural and urban development. Two regional ecosystems in the planning area are classified as Endangered (RE 12.3.1 – gallery rainforest; RE 12.11.23 – *Eucalyptus pilularis* open forest) and two are classified as Of concern (RE 12.1.1 – *Casuarina glauca* open forest, RE 12.8.8 – *Eucalyptus saligna* or *E. grandis* tall open forest), under the Queensland Vegetation Management Act 1999 (VM Act).

Of these REs, six have low or very low representation within the City (Table 2).

Short descriptions of the vegetation types present in the planning area are provided below. Additional information regarding weed species that occur in these areas is provided in Section 4.6.

**Table 2. Vegetation types occurring in the Elanora-Palm Beach conservation reserves**

<table>
<thead>
<tr>
<th>Regional Ecosystem</th>
<th>Vegetation Description</th>
<th>GCCC Vegetation Type</th>
<th>Vegetation Management Act Status</th>
<th>Extent Remaining in City</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1.1</td>
<td><em>Casuarina glauca</em> open forest on margins of marine clay plains</td>
<td>16</td>
<td>Of concern</td>
<td>Greater than 50 percent</td>
</tr>
<tr>
<td>12.1.2</td>
<td>Saltpan (saltmarsh) vegetation including grassland, herbland and sedgeland on marine clay plains</td>
<td>22</td>
<td>Least concern</td>
<td>Greater than 50 percent</td>
</tr>
<tr>
<td>12.1.3</td>
<td>Mangrove shrubland to low closed forest on marine clay plains and estuaries</td>
<td>18</td>
<td>Least concern</td>
<td>Greater than 50 percent</td>
</tr>
<tr>
<td>Regional Ecosystem</td>
<td>Vegetation Description</td>
<td>GCCC Vegetation Type</td>
<td>Vegetation Management Act Status</td>
<td>Extent Remaining in City</td>
</tr>
<tr>
<td>--------------------</td>
<td>------------------------</td>
<td>----------------------</td>
<td>----------------------------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>12.2.14</td>
<td>Fore dune complex dominated by <em>Casuarina equisitifolia</em> and <em>Banksia integrifolia</em></td>
<td>23</td>
<td>Least concern</td>
<td>10 to 30 percent</td>
</tr>
<tr>
<td>12.2.5</td>
<td>Mixed coastal forest of <em>Corymbia</em> spp., <em>Banksia integrifolia</em>, <em>Callitris columellaris</em>, <em>Acacia</em> spp. open forest to low closed forest on beach ridges</td>
<td>39</td>
<td>Least concern</td>
<td>30 to 50 percent</td>
</tr>
<tr>
<td>12.3.1</td>
<td>Gallery rainforest (notophyll vine forest) on alluvial plains</td>
<td>20a</td>
<td>Endangered</td>
<td>10 to 30 percent</td>
</tr>
<tr>
<td>12.3.5a</td>
<td>Palustrine wetland (e.g. vegetated swamp), <em>Melaleuca quinquenervia</em>, <em>Casuarina glauca</em> +/- <em>Eucalyptus tereticornis</em> open forest</td>
<td>15</td>
<td>Least concern</td>
<td>Less than 10 percent</td>
</tr>
<tr>
<td>12.8.8</td>
<td><em>Eucalyptus saligna</em> or <em>E. grandis</em> tall open forest on Cainozoic igneous rocks</td>
<td>41</td>
<td>Of concern</td>
<td>Greater than 50 percent</td>
</tr>
<tr>
<td>12.11.1</td>
<td>Simple notophyll vine forest (&quot;gully vine forest&quot;) often with abundant <em>Archontophoenix cunninghamiana</em> on metamorphics +/- interbedded volcanics</td>
<td>29a</td>
<td>Least concern</td>
<td>Greater than 50 percent</td>
</tr>
<tr>
<td>12.11.2</td>
<td><em>Eucalyptus saligna</em> or <em>E. grandis</em>, <em>E. microcorys</em>, <em>E. acmenoides</em>, <em>Lophostemon confertus</em> tall open forest on metamorphics +/- interbedded volcanics</td>
<td>2a</td>
<td>Least concern</td>
<td>Greater than 50 percent</td>
</tr>
<tr>
<td>12.11.3</td>
<td><em>Eucalyptus siderophloia</em>, <em>E. propinqua</em> open forest on metamorphics +/- interbedded volcanics</td>
<td>1b</td>
<td>Least concern</td>
<td>Greater than 50 percent</td>
</tr>
<tr>
<td>12.11.3a</td>
<td>Open-forest of <em>Lophostemon confertus</em> with <em>Eucalyptus microcorys</em> and <em>E. propinqua</em>.</td>
<td>2</td>
<td>Least concern</td>
<td>Greater than 50 percent</td>
</tr>
<tr>
<td>12.11.5a</td>
<td>Mixed <em>Eucalyptus/Corymbia</em> open forest</td>
<td>1</td>
<td>Least concern</td>
<td>30 to 50 percent</td>
</tr>
<tr>
<td>12.11.5k</td>
<td>Mixed <em>Corymbia/Eucalyptus</em> open forest</td>
<td>4d</td>
<td>Least concern</td>
<td>30 to 50 percent</td>
</tr>
<tr>
<td>12.11.23</td>
<td><em>Eucalyptus pilularis</em> open forest on low coastal metamorphics and interbedded volcanics</td>
<td>5</td>
<td>Endangered</td>
<td>10 to 30 percent</td>
</tr>
</tbody>
</table>

2 Queensland Vegetation Management Act 1999.

Coastal vegetation types (i.e. RE 12.2.14, RE 12.2.5) are present at Tarrabora Reserve, Beree-Badalla Reserve, and Schusters Park. These communities are dominated by coastal she-oak (*Casuarina equisitifolia*), coastal banksia (*Banksia integrifolia*), coastal cypress pine (*Callitris columellaris*), wattles (*Acacia* spp.) and bloodwoods (*Corymbia* spp.). Patches of these vegetation types in the planning area are moderately to highly degraded due to use by the public as walking areas, isolation from larger tracts of vegetation and factors associated with small patch size and edge effects including weed incursion. Although these vegetation types are somewhat degraded, they continue to provide considerable habitat value to the flora and fauna species that inhabit them.

Mangrove (RE 12.1.3) and saltpan (saltmarsh) vegetation (RE 12.1.2) are present at Beree-Badalla Reserve, Merv Craig Recreational Park, Currumbin Waters Park and Schusters Park. These vegetation types remain in relatively good condition due to increased resilience from terrestrial weed invasion and generally low public use. However, weeds are present in mangrove and saltmarsh vegetation at Schusters Park, particularly in areas with higher ground micro-relief and less saline soils. Mangrove vegetation is highly productive and is used by a large number of aquatic and terrestrial species for breeding, nursery and feeding habitat. The ecological value of mangrove habitat at Beree-Badalla Reserve and Schusters Park...
Park has been recognised by the State and the area is designated a Fish Habitat Area under the Fisheries Act.

Melaleuca open forest (RE 12.3.5a) dominated by coastal paperbark (*Melaleuca quinquenervia*) and coastal she-oak is present at Schusters Park andCurrumbin Waters Park. These vegetation types are moderately to highly affected by weed infestations. *Casuarina glauca* open forest (RE 12.1.1) (VM Act – Of concern) is present at Tarrabora Reserve, Beree-Badalla Reserve, Schusters Reserve and Merv Craig Recreational Reserve.

Gallery rainforest (RE 12.3.1) (VM Act – Endangered) patches at Coastal Meadows and River Glenn Park are narrow and have discontinuous canopy cover. These areas generally exhibit poor to moderate condition and are highly affected weed infestations.

Dry sclerophyll forest communities (REs 12.2.5, 12.11.2, 12.11.3, 12.11.3a, 12.11.5a, 12.11.5k and 12.11.23) are the most prevalent vegetation types in the planning area. These forest types are dominated by tree species including spotted gums (*Corymbia citriodora*, *C. henryi*), broad-leaved white mahogany (*Eucalyptus camea*), Queensland white stringybark (*E. tindaliae*), small-fruited grey gum (*Eucalyptus propinqua*), grey ironbark (*Eucalyptus siderophloia*), brush box (*Lophostemon confertus*) and blackbutt (*Eucalyptus pilularis*). These communities provide a number of microhabitat features for fauna including leaf litter, fallen timber, tree hollows, wet gullies and rocky areas. Dry sclerophyll forests are moderately to highly affected by weed infestations. Reasonably large patches of Blackbutt open forest (VM Act – Endangered) are present in Kimmulu Parklands, Bronhill Reserve, Calcita Avenue Reserve, Forest Drive Reserve, Eddie Kornhauser Recreational Reserve, Simpsons Road Conservation Area, and Casey Park.

Dry sclerophyll forest communities are particularly important in the planning area due to their role as core koala habitat. Forest red gum (*Eucalyptus tereticornis*), tallowwood (*E. microcorys*), grey gums (*E. propinqua/E. biturbinata*) and swamp mahogany (*E. robusta*) have been identified as preferred (primary) koala food tree species in the Gold Coast City Council area (Biolink 2007). Blackbutt is a secondary koala food tree species. These species are dominant, co-dominant or sub-dominant in many of the dry sclerophyll forest communities (i.e. RE 12.11.3, RE 12.11.5a, RE 12.11.5k) present in the reserves.

Small patches of wet sclerophyll forest are present at Simpsons Road Reserve (RE 12.11.2, approximately 0.9 hectares) and Kimmulu Parklands (RE 12.8.8, approximately 0.40 hectares). Wet sclerophyll forests have an open canopy of tall eucalypts such as flooded gum (*Eucalyptus grandis*) or Sydney blue gum (*Eucalyptus saligna*).

**Plant species of conservation significance**

Flora species of conservation significance are those listed under the Queensland *Nature Conservation (Wildlife) Regulation 2006* (NCWR) or Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) as Near threatened, Vulnerable, Endangered, Critically endangered or migratory. Significant flora that are known, or likely to occur in planning area are listed in Table 3, along with conservation status and short descriptions of their ecological requirements.

Five significant flora species have been identified within the reserves. These are small-leaved tamarind (*Diploglottis campbellii*) (Endangered – EPBC Act, NCWR), rusty rose walnut (*Endiandra hayesii*) (Vulnerable – EPBC Act, NCWR), black walnut (*Endiandra globosa*) (Near threatened – NCWR), silver leaf (*Argophyllum nullumense*) (Near threatened – NCWR) and Springbrook wedding bush (*Ricinocarpos speciosus*) (Vulnerable – NCWR).

Habitat for significant flora species is provided in rainforest, moist gully, Casuarina forest and mangrove areas in the planning area.
<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Status</th>
<th>Ecological Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Archidendron muellerianum²</td>
<td>veiny lace flower</td>
<td>Near threatened³</td>
<td>Subtropical littoral and riverine rainforest (DSEWPC 2010a).</td>
</tr>
<tr>
<td>Argophyllum nullumense¹</td>
<td>silver leaf</td>
<td>Near threatened³</td>
<td>Grows in subtropical and warm-temperate rainforest (PlantNet 2010).</td>
</tr>
<tr>
<td>Cassia marksiana²</td>
<td>brush cassia</td>
<td>Vulnerable³</td>
<td>Littoral and riverine rainforest, and regrowth vegetation.</td>
</tr>
<tr>
<td>Corymbia henryi²</td>
<td>large-leaved spotted gum</td>
<td>CWS⁵</td>
<td>Open forest areas on sub-coastal metasediments on ridges (GCC 2010a).</td>
</tr>
<tr>
<td>Cupaniopsis newmanii²</td>
<td>long-leaved tuckeroo</td>
<td>Near threatened³</td>
<td>Subtropical rainforest (PlantNet 2010).</td>
</tr>
<tr>
<td>Davidsonia johnsonii²</td>
<td>smooth davidsonia</td>
<td>Endangered³⁴</td>
<td>Predominantly occurs in wet sclerophyll forests and occasionally in complex notophyll</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>rainforest (complex notophyll vine forest) (Stewart &amp; McKinley 1999).</td>
</tr>
<tr>
<td>Diploglottis campbellii¹</td>
<td>small-leaved tamarind</td>
<td>Endangered³⁴</td>
<td>Rainforest in areas from low altitude alluvial flats to elevated rocky</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>slopes, including small remnant patches (NSWPWS 1999).</td>
</tr>
<tr>
<td>Echinostephia aculeata¹</td>
<td>prickly tape vine</td>
<td>CWS⁵</td>
<td>Mainly found in open forest, often near, but seldom in rainforest (PlantNet 2010).</td>
</tr>
<tr>
<td>Endiandra floydii²</td>
<td>Crystal Creek walnut</td>
<td>Endangered³⁴</td>
<td>Warm-temperate and subtropical rainforest, from sea level to 430 m elevation (PlantNet</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2010).</td>
</tr>
<tr>
<td>Endiandra globosa¹</td>
<td>black walnut</td>
<td>Near threatened³</td>
<td>Riverine rainforest on rich alluvial soils and subtropical rainforest on moist slopes</td>
</tr>
<tr>
<td>Endiandra hayesii¹</td>
<td>rusty rose walnut</td>
<td>Vulnerable³⁴</td>
<td>Subtropical and warm temperate rainforests, and brush box</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Lophostemon confertus) forests, including regrowth and highly modified forms of these</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>habitats (DEWHA 2008e).</td>
</tr>
<tr>
<td>Gossia fragrantissima²</td>
<td>small-leaved myrtle</td>
<td>Endangered³⁴</td>
<td>Dry subtropical and riverine rainforest (BGT 2010).</td>
</tr>
<tr>
<td>Hicksbeachia pinnatifolia²</td>
<td>red bopple nut (monkey nut)</td>
<td>Vulnerable³</td>
<td>Margins of subtropical rainforest from near sea level to 700 m altitude and sometimes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>extends into wet sclerophyll forest (DEWHA 2008d).</td>
</tr>
<tr>
<td>Lepiderema pulchella²</td>
<td>fine-leaved tuckeroo</td>
<td>Near threatened³</td>
<td>Riverine (lowland) subtropical rainforest (PlantNet 2010).</td>
</tr>
<tr>
<td>Macadamia integrifolia²</td>
<td>macadamia nut</td>
<td>Vulnerable³⁴</td>
<td>Subtropical rainforest on alluvial plains and igneous rocks and metamorphic sediments</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>on hills and ranges (Leiper et al. 2009).</td>
</tr>
<tr>
<td>Macadamia tetraphylla²</td>
<td>Queensland nut</td>
<td>Vulnerable³⁴</td>
<td>Rainforest on hills and in coastal areas; wet sclerophyll vegetation                    (Costello et al. 2009).</td>
</tr>
<tr>
<td>Scientific Name</td>
<td>Common Name</td>
<td>Status</td>
<td>Ecological Requirements</td>
</tr>
<tr>
<td>------------------------------</td>
<td>------------------------</td>
<td>-------------------------</td>
<td>-----------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><em>Melaleuca thymifolia</em>²</td>
<td>thyme honeymyrtle</td>
<td>CWS⁵</td>
<td>Open forest and heath on poorly drained coastal sand (GCCC 2010a).</td>
</tr>
<tr>
<td><em>Pararistolochia praemorsina</em>²</td>
<td>Richmond birdwing vine</td>
<td>Near threatened³</td>
<td>Subtropical rainforest in coastal areas (PlantNet 2010).</td>
</tr>
<tr>
<td><em>Plectranthus nitidus</em>²</td>
<td>nightcap plectranthus</td>
<td>Endangered³⁴</td>
<td>Forms small clumps in gullies and on boulders in rainforest or open forest on the margins of rainforest (DEWHA 2008a).</td>
</tr>
<tr>
<td><em>Pollia macrophylla</em>²</td>
<td>large-leaved pollia</td>
<td>CWS⁵</td>
<td>Riparian corridors and on soaks in sub-coastal metasediments (GCCC 2010a).</td>
</tr>
<tr>
<td><em>Pouteria queenslandica</em>²</td>
<td>blush coondoo</td>
<td>CWS⁵</td>
<td>Grows in well developed littoral and dry rainforest (PlantNet 2010).</td>
</tr>
<tr>
<td><em>Proiphys cunninghamii</em>²</td>
<td>Brisbane lily</td>
<td>CWS⁵</td>
<td>Wet and dry sclerophyll forest and along rainforest margins (PlantNet 2010).</td>
</tr>
<tr>
<td><em>Rhodamnia maideniana</em>²</td>
<td>smooth scrub turpentine</td>
<td>Near threatened³</td>
<td>Subtropical rainforest, coastal districts (Leiper et al. 2009).</td>
</tr>
<tr>
<td><em>Ricinocarpos speciosus</em>¹</td>
<td>wedding bush</td>
<td>Vulnerable³</td>
<td>Damp areas along streams (PlantNet 2010).</td>
</tr>
<tr>
<td><em>Syzygium hodgkinsoniae</em>²</td>
<td>red lilly pilly</td>
<td>Vulnerable³⁴</td>
<td>Riverine rainforest on rich alluvial or basaltic soils (DEWHA 2008b).</td>
</tr>
<tr>
<td><em>Syzygium moore</em>²</td>
<td>duroobby</td>
<td>Vulnerable³⁴</td>
<td>Warm, protected, fertile soils in riverine and gully rainforests at low elevations (DEWHA 2008c).</td>
</tr>
<tr>
<td><em>Taeniophyllum mueller</em>²</td>
<td>chain ribbon root orchid</td>
<td>Vulnerable⁴</td>
<td>Mangroves and rainforest (PlantNet 2010).</td>
</tr>
<tr>
<td><em>Tinospora tinosporoides</em>²</td>
<td>arrow-head vine</td>
<td>Vulnerable³⁴</td>
<td>Semitropical rainforest (DEWHA 2008f).</td>
</tr>
</tbody>
</table>

¹ Known to occur in the planning area.
² Likely to occur in the planning area.
⁵ CWS – City Wide Significant Species (Ecosure 2012).
**2.3.1.4 Fauna**

**Fauna habitats**
The planning area contains a wide variety of landforms and associated habitats including: 1) coastal and intertidal areas, 2) large creeks with areas of shallow and deep fresh, brackish and marine waters, and 3) coastal plains, hills and ridgelines containing a mixture of terrestrial vegetation types. These areas support diverse assemblages of local, nomadic and migratory fauna. Larger reserves including Elanora Conservation Area and Simpsons Road Reserve contain vegetation that exhibits high structural integrity in the canopy and understorey layers and are expected to function as important fauna habitat and refuge areas within the residential setting that characterises the south-central section of the management cluster.

The following summary provides a general overview of the range of fauna habitats present in and adjacent to the planning area.

**Coastal vegetation types**
Coastal vegetation types (RE 12.2.14 fore dune complex, RE 12.2.5 mixed coastal forest) at Tarrabora Reserve cover a small amount of area (approximately 4.4 hectares) within the management cluster. Although these habitat areas are small they are unique in the landscape (and their relative habitat value is high) due to previous clearing associated with development of coastal areas.

**Mangrove and saltmarsh**
Mangrove (RE 12.1.3) habitat is present at Schusters Park (along Tallebudgera Creek) and at Beree-Badalla Reserve, Merv Craig Recreational Park and Currumbin Waters Park (along Currumbin Creek) and seagrass beds occur within Currumbin Creek (GHD, 2004). Mangrove and seagrass communities provide important nursery habitat for juveniles of marine fish species. The presence and extent of use of marine fish species in mangroves is considerably reliant on the maintenance of tidal flows and clear fish passage during high tide periods. Large grey mangroves (*Avicennia marina* subsp. *australasica*) at Schusters Park often contain hollows in their main branches or trunks. Hollows provide important habitat features for birds, reptiles, small terrestrial mammals and roosting micro-bats.

Saltmarsh (RE 12.1.2) areas are present in upper tidal zones (i.e. interface areas between tidal and terrestrial areas) adjacent to Tallebudgera Creek and Currumbin Creek at Schusters Park, Beree-Badalla Reserve, Merv Craig Recreational Park and Currumbin Waters Park. Saltmarshes are often used by shorebirds, songbirds, and raptors such as whistling kite (*Haliastur sphenurus*) and swamp harrier (*Circus approximans*) for foraging or breeding habitat and may also be used as nursery habitats for marine fish species. Saltmarshes also provide key habitat features for insectivorous bats and terrestrial fauna including small mammals and wallabies, particularly in areas adjacent to mangroves (Saintilan 2009).

**Melaleuca open forest**
Melaleuca open forest (RE 12.3.5a) provides habitat for a wide variety of terrestrial fauna species. Nectivorous birds (e.g. honeyeaters) and bats such as the vulnerable grey-headed flying fox (*Pteropus poliocephalus*) (EPBC Act – Vulnerable) rely on Melaleuca forest as primary foraging habitat during flowering periods (e.g. autumn, winter). Melaleuca forest is present at Schusters Park and Eddie Kornhauser Recreational Area, Beree-Badalla Reserve, Merv Craig Recreational Park and Currumbin Waters Park.

**Dry sclerophyll forest**
Dry sclerophyll forest habitats (RE’s 12.2.5, 12.11.2, 12.11.3, 12.11.3a, 12.11.5a, 12.11.5k and 12.11.23) cover the largest amount of naturally vegetated area in the management cluster (approximately 320 hectares). Relatively large areas of dry sclerophyll forest are present on the hills and ridgelines in the south-central portion of the management cluster,
including large portions of the Elanora Conservation Area and Simpsons Road Reserve (and adjacent areas). The habitat value of these areas is enhanced due to reasonable connectivity (which is to some degree hampered by Tallebudgera Connection Road) to large tracts of vegetation west of the management cluster, and the presence of considerable amounts of vegetation on private land in the area.

This habitat type is characterised by an open canopy dominated by a variety of eucalypt species, a sparse shrub stratum, and a dense to mid-dense grass understorey. Fauna microhabitats in this habitat type include grassy/herbaceous understorey areas, leaf litter, fallen logs and branches, mature hollow-bearing trees, exfoliated bark, and occasional low-relief (i.e. 1-2 boulder layers high) rock outcrop areas. Areas containing native grasses including kangaroo grass (*Themeda triandra*) are present and provide high quality habitat for ground-dwelling mammals.

Dry sclerophyll forest may support a number of fauna species of conservation significance. This forest type is dominated by forest red gum (*Eucalyptus tereticornis*), tallowwood (*E. microcorys*), grey gums (*E. propinqua/E. biturbinata*) and swamp mahogany (*E. robusta*) which provide core habitat for important local koala (*Phascolarctos cinereus*) populations. Additional significant species such as death adder (*Acanthophis antarcticus*), powerful owl (*Ninox strenua*), or large-eared pied bat (*Chalinolobus dwyeri*) may utilise dry sclerophyll forests as core habitat.

**Wet sclerophyll forest**

Wet sclerophyll forest habitat (RE 12.8.8) has an open canopy of tall eucalypts such as the Sydney blue gum (*Eucalyptus saligna*) and flooded gum (*Eucalyptus grandis*). The understory is multi-layered and is often composed of diverse mixture of shrubs, vines, herbs and ferns. This habitat is unique in the landscape and is expected to support diverse fauna assemblages.

**Riparian/Gully rainforest**

Riparian (gallery) rainforest (RE 12.3.1) and gully rainforest (RE 12.11.1) are present as relatively small linear patches along Currumbin Creek or ephemeral drainages in sclerophyll forest. Riparian rainforest areas exhibit high floral diversity and generally support diverse fauna communities. This habitat type may support populations of fauna species of conservation significance including tusked frog (*Adelotus brevis*), green-thighed treefrog (*Litoria brevipalmata*), Coxen’s fig-parrot (*Cyclopsitta diophthalma coxeni*) and the Richmond birdwing butterfly (*Ornithoptera richmondia*).

**Fauna species of conservation significance**

Fauna species of conservation significance are those listed under the NCWR or the EPBC Act as Near threatened, Vulnerable, Endangered, Critically endangered or migratory. At least 30 fauna species of conservation significance are known or likely to occur in the planning area. A summary of these species, including conservation status and short descriptions of their ecological requirements, is provided in Table 4.

Schusters Park, Beree-Badalla Reserve, Merv Craig Recreational Park, Elanora Conservation Area, Simpsons Road Reserve, Kimmulu Parklands and many of the smaller reserves (e.g. Wyara Park Reserve, Forest Drive Reserve) located in the south-central portion of the planning area are known to provide important habitat areas for significant fauna species.

A number of locally (i.e. city-wide) significant species including the black bittern (*Ixobrychus flavicollis*), swamp harrier, peregrine falcon (*Falco peregrinus*) and various shorebirds species including bar-tailed godwit (*Limosa lapponica*), little curlew (*Numenius minutus*) and common greenshank (*Tringa nebularia*) have been recorded within the various habitats of the planning area. The short-beaked echidna (*Tachyglossus aculeatus*) (listed as a special least concern species under the NCWR) is also present in the planning area.
Koalas are known or likely to occur at: Elanora Conservation Area, Simpsons Road Reserve, Kimmulu Parklands, Forest Drive Reserve, Calcuta Avenue Reserve, Wyara Park, Breyinia Court Reserve, Buckingham Way Reserve, Simpsons Road Conservation Area, Casey Park, Avocado Park and Raleigh Terrace Reserve. These areas contain high quality koala foraging habitat (Biolink 2007).

Biolink Ecological Consultants (2007) proposed a Koala Sustainability Area over the south-central section of the management cluster in a city wide koala study. Koala Sustainability Areas are large areas of relatively intact remnant or regrowth eucalyptus dominated forest or woodland (within the urban footprint area) that contain high quality koala habitat and/or high koala densities. The topographically diverse terrain of the area is likely a key factor for populations remaining in these areas.

No large flying fox colonies are known to occur in the planning area. However, a large colony is present at Preston Park along the southern bank of Currumbin Creek, directly across from Merv Craig Recreational Park. Individuals that roost at Preston Park regularly utilise Merv Craig Recreational Park as secondary roosting and foraging habitat.

Table 4. Fauna species of conservation significance that are known or likely to occur in the Elanora-Palm Beach Conservation Reserves

<table>
<thead>
<tr>
<th>Scientific Name/Common</th>
<th>Status</th>
<th>Ecological Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AMPHIBIANS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>wallum froglet (<em>Crinia tinnula</em>)(^2)</td>
<td>Vulnerable (NCWR(^3))</td>
<td>Inhabits poorly drained coastal wallum heathland and poorly drained Melaleuca forest (Queensland Museum 2007, Tyler and Knight 2009).</td>
</tr>
<tr>
<td>green-thighed treefrog (<em>Litoria brevipalmata</em>)(^2)</td>
<td>Near threatened (NCWR(^3))</td>
<td>Inhabits rainforest edges, open forest, woodland and disturbed grassy habitats; eggs laid in temporary and semi-permanent shallow ponds, pools, ditches and soaks (Queensland Museum 2007).</td>
</tr>
<tr>
<td><strong>REPTILES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a rainforest skink (<em>Saproscincus rosei</em>)(^2)</td>
<td>Near threatened (NCWR(^3))</td>
<td>Occurs in rainforests and wet eucalyptus forests (Wilson 2005).</td>
</tr>
<tr>
<td>death adder (<em>Acanthophis antarcticus</em>)(^2)</td>
<td>Near threatened (NCWR(^3))</td>
<td>Inhabits dry and wet eucalypt forests, rainforest and lowland heath. Often uses leaf litter for cover (Wilson 2005).</td>
</tr>
<tr>
<td><strong>BIRDS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>little tern (<em>Sternula albifrons</em>)(^1)</td>
<td>Endangered (NCWR(^3), EPBC(^4))</td>
<td>Forages in sheltered coastal water environments and nests on exposed beaches (Simpson and Day 2004; DSEWPC 2010b).</td>
</tr>
<tr>
<td>regent honeyeater (<em>Anthochaera phrygia</em>)(^2)</td>
<td>Endangered (NCWR(^3), EPBC); Migratory (EPBC)</td>
<td>Inhabits creek flats, broad river valleys and foothills vegetated with dry box-ironbark eucalypt woodland and dry sclerophyll forest associations (DSEWPC 2010b).</td>
</tr>
<tr>
<td>rainbow bee-eater (<em>Merops ornatus</em>)(^1)</td>
<td>Migratory (EPBC(^4))</td>
<td>Common and widespread in lightly timbered areas (Simpson and Day 2004).</td>
</tr>
<tr>
<td>black-faced monarch (<em>Monarcha melanopsis</em>)(^1)</td>
<td>Migratory (EPBC(^4))</td>
<td>Occurs in eucalypt forest, rainforest and coastal scrub (Simpson and Day 2004).</td>
</tr>
<tr>
<td>spectacled monarch (<em>Monarcha trivirgatus</em>)(^1)</td>
<td>Migratory (EPBC(^4))</td>
<td>Occurs in rainforest and wetter eucalypt forests (Simpson and Day 2004).</td>
</tr>
<tr>
<td>rufous fantail (<em>Rhipidura rufifrons</em>)(^1)</td>
<td>Migratory (EPBC(^4))</td>
<td>Favours denser undergrowth of rainforest, mangroves and swamp woodlands. Occasionally frequents parks and gardens (Simpson and Day 2004).</td>
</tr>
<tr>
<td>satin flycatcher (<em>Myiagra cyanoleuca</em>)(^1)</td>
<td>Migratory (EPBC(^4))</td>
<td>Occurs in wetter, denser forest, often at higher elevations (Simpson and Day 2004).</td>
</tr>
<tr>
<td>Scientific Name/Common</td>
<td>Status</td>
<td>Ecological Requirements</td>
</tr>
<tr>
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</tr>
<tr>
<td>Australian swiftlet (<em>Aerodramus terraereginae</em>)⁴</td>
<td>Near threatened (NCWR³)</td>
<td>Forages over coastal ranges, cliffs, grasslands. Breeds in caves (Simpson and Day 2004).</td>
</tr>
<tr>
<td>White-throated needletail (<em>Hirundapus caudacutus</em>)⁴</td>
<td>Migratory (EPBC⁴)</td>
<td>Almost exclusively aerial; forages over most forest types; breeds in Asia (Simpson and Day 2004).</td>
</tr>
<tr>
<td>Lewin’s rail (<em>Lewinia pectoralis</em>)¹</td>
<td>Near threatened (NCWR³)</td>
<td>Favours densely vegetated fresh, brackish or saline wetlands usually with areas of standing waters (Simpson and Day 2004).</td>
</tr>
<tr>
<td>Australian painted snipe (<em>Rostratula australis</em>)²</td>
<td>Vulnerable (NCWR³, EPBC⁴)</td>
<td>Generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and clay pans; occasionally occurs in inundated grassland and saltmarsh (DSEWPC 2010b).</td>
</tr>
<tr>
<td>great egret (<em>Ardea alba</em>)¹</td>
<td>Migratory (EPBC⁴)</td>
<td>Utilises floodwaters, rivers, wetland shallows, and intertidal mudflats as foraging habitat.</td>
</tr>
<tr>
<td>cattle egret (<em>Ardea ibis</em>)¹</td>
<td>Migratory (EPBC⁴)</td>
<td>Utilises pasture, freshwater wetland shallows as foraging habitat (Simpson and Day 2004).</td>
</tr>
<tr>
<td>double-banded plover (<em>Charadrius bicinctus</em>)¹</td>
<td>Migratory (EPBC⁴)</td>
<td>Inhabits intertidal sand and mudflats, beaches and occasionally occurs on sub-coastal fresh and saltwater lakes (Simpson and Day 2004).</td>
</tr>
<tr>
<td>Latham’s snipe (<em>Gallinago hardwickii</em>)¹</td>
<td>Migratory (EPBC⁴)</td>
<td>Inhabits freshwater wetlands and saltmarsh (Simpson and Day 2004).</td>
</tr>
<tr>
<td>grey-tailed tattler (<em>Heteroscelus brevipes</em>)¹</td>
<td>Migratory (EPBC⁴)</td>
<td>Inhabits estuaries, mangroves, rocky coasts and reefs (Simpson and Day 2004).</td>
</tr>
<tr>
<td>bar-tailed godwit (<em>Limosa lapponica</em>)</td>
<td>Migratory (EPBC⁴)</td>
<td>Inhabits intertidal flats and sand banks.</td>
</tr>
<tr>
<td>eastern curlew (<em>Numenius madagascariensis</em>)³</td>
<td>Near threatened (NCWR³)</td>
<td>Inhabits coastal estuaries, intertidal mudflats, mangroves and sand spits; prefers intertidal mudflats for foraging habitat (Simpson and Day 2004, Geering et al. 2007).</td>
</tr>
<tr>
<td>black-necked stork (<em>Ephippiorhynchus asiaticus</em>)¹</td>
<td>Near threatened (NCWR³)</td>
<td>Inhabits river pools, swamps, tidal flats (Simpson and Day 2004).</td>
</tr>
<tr>
<td>glossy-black cockatoo (eastern) (<em>Calyptorhynchus lathami lathami</em>)¹</td>
<td>Vulnerable (NCWR³)</td>
<td>Dependent on <em>Allocasuarina</em> and prefers forest with this plant genus.</td>
</tr>
<tr>
<td>grey goshawk (<em>Accipiter novaehollandiae</em>)¹</td>
<td>Near threatened (NCWR³)</td>
<td>Occurs in various forests, particularly coastal closed forest (Simpson and Day 2004).</td>
</tr>
<tr>
<td>powerful owl (<em>Ninox strenua</em>)¹</td>
<td>Vulnerable (NCWR³)</td>
<td>Inhabits open sclerophyll forests and woodlands (Simpson and Day 2004). Needs larger tracts of forest for survival.</td>
</tr>
<tr>
<td>koala (<em>Phascolarctos cinereus</em>)¹</td>
<td>Vulnerable (South East Queensland)(NCWR³)</td>
<td>Occurs in dry and wet eucalypt forest and Melaleuca forest (Strahan 2002).</td>
</tr>
<tr>
<td>large-eared pied bat (<em>Chalinolobus dwyeri</em>)²</td>
<td>Vulnerable (NCWR³, EPBC⁴)</td>
<td>Inhabits dry sclerophyll forest and woodland; edge of rainforest and wet sclerophyll (Strahan 2002; Churchhill 1998).</td>
</tr>
<tr>
<td>grey-headed flying-fox (<em>Pteropus poliocephalus</em>)¹</td>
<td>Vulnerable (EPBC⁴)</td>
<td>Roosts in eucalypt forest, mangroves and Melaleuca forest (Strahan 2002; Churchhill 1998).</td>
</tr>
<tr>
<td>Large-footed Myotis (<em>Myotis macropus</em>)¹</td>
<td>CWS⁶</td>
<td>Generally occurs near large and permanent waterways (required for feeding on aquatic invertebrates and small fish) at low elevations, in flat or undulating terrain, usually surrounded by vegetation (Anderson et al. 2006).</td>
</tr>
<tr>
<td>BUTTERFLIES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>mangrove ant-blue butterfly (<em>Acrodipsas illidgei</em>)²</td>
<td>Vulnerable (NCWR³)</td>
<td>Inhabits mangroves (Common and Waterhouse 1981).</td>
</tr>
</tbody>
</table>
Scientific Name/Common | Status | Ecological Requirements
--- | --- | ---
Richmond birdwing (*Ornithoptera richmondia*)<sup>2</sup> | Vulnerable (NCWR)<sup>3</sup> | Eggs are laid on the larval food plants *Aristolochia praevensa* and *A. deltantha* which grow in rainforest (Common and Waterhouse 1981).

<sup>1</sup>Known to occur in or near the planning area.
<sup>2</sup> Likely to occur in the planning area.
<sup>3</sup>NCWR = Queensland Nature Conservation (Wildlife) Regulation 2006

2.3.2 Landscape values

2.3.2.1 Ecological corridors

Two critical ecological corridors have been mapped over the planning area by both the former Department of Environment and Resource Management (DERM) (EPA 2006) and the Council’s Nature Conservation Strategy 2009-2019 (NCS). These corridors connect large areas of intact remnant vegetation in the City’s west to coastal areas in the east. Tallebudgera Creek, Currumbin Creek and the intervening ridgelines are important landscape features that support the ecological functions (e.g. movement, habitat) of the corridors.

The Burleigh Heads-Springbrook bioregional corridor links the forests of Springbrook (in the west), Austinville, and Bonogin valleys with coastal forests of Reedy Creek and Burleigh Heads and the Pacific Ocean. Naturally vegetated areas along Tallebudgera Creek, including areas in Schusters Park, contribute to the function of this regional corridor.

The Currumbin to Currumbin Valley and Currumbin to Cobaki Broadwater bioregional corridor (the Currumbin Corridor) provides valuable links between the Currumbin headland through the Currumbin Valley to Springbrook and to the south through Tugun to the Cobaki Broadwater in Tweed Shire. Some of the notable values of the Currumbin to Currumbin Valley corridor are:

- Springbrook National Park
- Currumbin Hill Conservation park
- Nicoll Scrub National Park
- GCCC Conservation Reserves

Remnant vegetation present on the hills and slopes in the south-central portion of the planning area and along Currumbin Creek provides important contributions to the functioning of the Currumbin Corridor. Currumbin Creek reserves such as Currumbin Waters Park, Merv Craig Recreational Park, Beree-Badalla Reserve and Tarrabara Reserve also contribute to the corridor’s function. Reserves on the hills and slopes that are particularly important to the Currumbin Corridor are Simpsons Road Reserve, Elanora Conservation Area, Kimmulu Parklands, Forest Drive Reserve and Simpsons Road Conservation Area. Vegetation in and adjacent to these reserves forms an important local-scale corridor that connects the reserves to larger tracts of vegetation that are located west of Tallebudgera Connection Road. This connectivity is particularly important for maintaining koala populations and also plays an important role in the viability of many other plant and animal species that inhabit the area.

2.3.2.2 Scenic amenity

Landscape values contribute to the economy and liveability of a region and can include biodiversity, rural production, scenic amenity, landscape heritage, and outdoor recreation
The reserves make an important contribution to the landscape urban amenity values of the southern Gold Coast. Landscape features in the area are diverse and include forested areas, rainforests, semi-rural areas, ridgelines and undulating land, flood plains, and creek lines (notably those of Tallebudgera and Currumbin creeks). The reserves are prominent natural elements in the southern coastal area of the Gold Coast. Reserves such as Simpsons Road Reserve and Elanora Conservation Area are visible from Tallebudgera Creek Road, Tallebudgera Connection Road and Currumbin Creek Road and contribute to green backdrop for the City that can be viewed from many parts of the lowland and coastal areas.

Both the Currumbin and Tallebudgera Valleys (including eastern portions of the valleys in planning area) are designated as Major Scenic Routes and Transitory Gateways on Planning Strategy Map PS14 of the Gold Coast Planning Scheme and the two valleys are mostly mapped as having high to very high scenic amenity in GCCC Scenic Amenity 2008 mapping. Gold Coast City Council scenic amenity mapping (Terranean Mapping Technologies 2008) indicates that the Visual Exposure of the planning area ranges from low (in urban developed areas) to very high (for ridgelines and along Tallebudgera and Currumbin creeks). Most high quality scenic areas are located at in the south-central section of the management cluster (at higher altitudes), along the larger creeks, and along the coastal foreshore. Moderate quality scenic areas generally occur in areas with lower density residential development and low quality areas correspond with higher density developed areas.

Landforms in the area such as valleys, ridgelines and adjacent coastal landforms have influenced vegetation cover, patterns of settlement and land use. Vegetation on the upper slopes is dominated by dry sclerophyll communities and some rainforest, while lower slopes and floodplains adjacent to creek lines have been largely cleared for residential development. Although riparian vegetation along Tallebudgera and Currumbin creeks is generally narrow, the scenic quality of these waterways remains generally high. The Beree-Badalla Reserve boardwalk and Tarrabora Reserve walking tracks provide excellent view points along Currumbin Creek.

Significant high quality view corridors are present at the Gold Coast Highway crossing points over Tallebudgera Creek and Currumbin Creek (Terranean Mapping Technologies and Conics 2009). Driver's travelling north over the Gold Coast Highway/Tallebudgera Creek crossing experience majestic views of the Burleigh Headland and conservation park, the coastal creek inlet and hinterland ranges on the wester horizon. Similar view qualities are experienced at the Gold Coast Highway/Currumbin Creek crossing where views of Currumbin Alley, Beree-Badalla Reserve and hinterland ranges are also available.

2.3.3 Cultural heritage values

2.3.3.1 Aboriginal

The Gold Coast region has a rich Aboriginal history and the management cluster lies within the territory of the Yugambeh Language Group which stretches from the vicinity of the Logan River in the north to the Tweed River in the south, and west into the Scenic Rim Shire. There is evidence indicating that the Yugambeh people have had a presence in the region for over 24,000 years.

Historically, the Yugambeh people treasured the lower courses of Tallebudgera and Currumbin creeks as rich fishing grounds, and as a source of the cobra-worm, found in flotsam timber washed downstream by flood waters (Longhurst 2007). The Yugambeh people also collected rock oysters along the creek banks and dug for “eugarie” (pipis) in open beach areas. The densely wooded bushland areas behind the coastal sand dunes, swamps and lagoons of the area provided ample opportunities for hunting wallaby, pademelons, goanna, snakes, ducks and other waterbirds (Longhurst 2007). Swampland
between the creeks provided bungwall fern which was used to make a flour like meal which was baked in ground pits with hot ashes. Compared to some of the interior country which was subject to more distinct seasonal climate changes, the coastal areas utilised by the Yugambeh provided a stable environment rich in resources.

The coastal landscape influenced (and still forms) part of the Yugambeh’s spiritual beliefs. Corroborees and dances attracting people from throughout the region were held around the Burleigh Headland and the Jebbribillum Bora ring, reserved since 1913, is located just a few kilometres north up the coast from the reserves (Longhurst 1991).

2.3.3.2 European

The area now known as the Gold Coast was first visited by Europeans in the late 1700s. Originally a part of New South Wales and effectively a penal colony, the area saw very little European occupation until after the 1820s. The first official record of the passage of Anglo Celtic descendents through the area (along Palm Beach) occurred in November 1832 when Chief Constable John Macintosh lead a party south along the coastline to Port Macquarie (Longhurst 2007).

As part of a government survey carried out between the locations now known as Southport and Tweed Heads, the planning area was first mapped in 1829-30. The large quantity of timber (notably red cedar) identified within the surveyed area resulted in a northward migration of timber getters from the Tweed area. The beaches of today’s Gold Coast became a well-trodden path to and from Brisbane, then the most northerly port in New South Wales where many timber getters spent their earnings during binges to the town (Longhurst 2007). This necessitated safe crossings of Tallebudgera and Currumbin creeks which were established in the early 1850s.

The first tenure, a cattle grazing lease holding named “Dungogie”, established in today’s southern Gold Coast was granted to Alfred William Compigne in 1851. The boundaries of “Dungogie” included areas of the current suburbs of Elanora, Tallebudgera, and much of Tallebudgera and Currumbin valleys. Following subsequent lease resumptions and the establishment of provisions under the Crown Lands Alienation Act of 1868, small farmers flocked to the fertile banks of Tallebudgera Creek. John Joseph Dwyer became the first permanent resident in the current Elanora suburb, on a block of 80 acres. Additional smaller early farming holdings in the area were held by Andrew Joseph Dwyer, Heinrich Gripske, Timothy Guinea and James Dolan. A large lease, covering the coastal areas between Tallebudgera and Currumbin creeks (Palm Beach, Elanora and Currumbin Waters), was granted to Henry Jordan in 1873. By 1878 Mr. Jordan had established a dairy and piggery, the first serious attempt at commercial dairying in the Gold Coast and hinterland region (Longhurst 1994).

The new township of Tallebudgera was thriving as early as 1870 and a concerted program of road works commenced in the area in 1879, including the current Tallebudgera Connection Road and Guineas Creek Road. By February 1883 Cobb & Co were operating a daily service to the once isolated settlement. Increased traffic north over the Border Range Road (from Murwillumbah) and south from Southport brought regular visitors and a new industry - tourism. The coastal strand from Burleigh Head to Currumbin Creek was regularly used by coach and buggy operators to shuttle tourists up and down the coast (Longhurst 2007).

In 1900, the Queensland Government decided to proceed with the development of a new railroad line south from Nerang to Tweed Heads (by way of Mudgeeraba). With the establishment of the Booningbah railway station (later known as West Burleigh railway station) and the subdivision of a single large parcel (Henry Jordan’s parcel) into 36 dairy farms, growth of both the industry and the local population continued. One dairy farm,
previously owned by Fred Jonathon Schuster (and family) would eventually become the popular contemporary Schusters Park.

The new passion for “open surf bathing” led to a sudden land boom along the South Coast. In 1912 Coolangatta was drawing tourists from areas in both Queensland and New South Wales. The Palm Beach Estate development was proposed for the area between Tallebudgera and Currumbin Creeks in 1922, offering 134 “choice ocean sites”. The Elanora Railway Station was built, densely wooded areas were cleared for the construction of Palm Avenue and the “premier seaside resort” community of Palm Beach was established. A major milestone for the Palm Beach community came in 1926 when new “motor traffic” bridges were constructed over Tallebudgera Creek and Currumbin Creek and the local expansion of the coastal road.

Despite the Great Depression of the 1930s, the community continued to grow. The woodlands of the area experienced substantial clearing at this time to allow for home construction and property development. The area became an important training, rest and recreation area for Allied military personnel in the 1940s, with at least one camp of American soldiers stationed close to Palm Beach. Several new businesses appeared to cater for the demands and influx of both permanent and temporary residents in the area; in 1947 the local population had grown to 529 individuals. In 1948, the Town of the South Coast was established as a local government area to include areas of Southport, Surfers Paradise, Palm Beach and Coolangatta. A new surge in development came in the early 1950s after building restrictions in the Palm Beach area were lifted and a daily air service connected Bilinga Airport with Sydney and Melbourne. Palm Beach and adjacent areas were transformed at this time as numerous holiday flats, stores, cafes and tea rooms were built to further service a growing tourism industry (Longhurst 2007). Canal estates built during the early 1970s at Palm Beach gave land owners access to Tallebudgera Creek and the Pacific Ocean. The pace and scale of development within the planning area during the late 1900s has contributed to there being only a limited number of remaining relics representing the early days of European settlement.

No cultural heritage sites, listed on the National Heritage Register, the Queensland Heritage Register or the Gold Coast Local Heritage Register, are present in the planning area.

2.3.4 Recreation values

This Elanora-Palm Beach area contains a significant recreational network, including beaches, waterways, sports ovals, family parks, horse riding clubs and conservation reserves, with a close integration between conservation reserves and active recreation areas that allows park users to walk, play and ride in a bushland setting. This management plan is focussed on those reserves, or parts of reserves, that are managed for conservation purposes. The conservation reserves (planning area) provide a number of nature-based recreational opportunities for residents and visitors located in close proximity to urban areas: including walking, running, horse riding, swimming, kayaking, canoeing, photography and bird watching.

Walking tracks (or boardwalks) that traverse high quality natural areas have been established for public use at Tarrabora Reserve, Beree-Badalla Reserve, Currumbin Waters Park, Schusters Park, Eddie Kornhauser Recreational Reserve, Elanora Conservation Area and Forest Drive Reserve (Figure 2). These walking tracks provide the public with opportunities to experience the natural environment and encourage local residents to lead active and healthy lifestyles.

The Beree-Badalla Boardwalk provides walkers with a well balanced experience by passing through a diversity of coastal environments along the Currumbin Creek estuary. The boardwalk can be combined with concrete tracks in Tarrabora Reserve for a longer, very
scenic, walking experience. Water-front sections of the boardwalk are complimented by areas vegetated with mangrove, saltmarsh and Casuarina woodland. The boardwalk is very popular with recreational walkers that use it for either leisure walking or fitness training.

A number of additional formal (i.e. sealed surface) walking and cycling paths that traverse park settings are provided at formal recreation parks in the management cluster such as Palm Beach Parklands, Laguna Park, Murlong Park, Galleon Park, Eddie Kornhauser Recreational Reserve, and Bill Thomson Park. Cycling lanes along Nineteenth Avenue, Avocado Street, Guineas Creek Road, Galleon Way and KP McGrath Drive provide cycling transport routes between many of the reserves located along Tallebudgera Creek, Currumbin Creek and the coastal foreshore. These paths provide medium distance/low difficulty walking and cycling experiences for the general public.

There is opportunity to link existing walking and cycling paths in Elanora and Palm Beach with planned public transport nodes (e.g. Tallebudgera Rail Station to be located near the Pacific Motorway (M1) Tallebudgera Creek crossing) and existing track networks in the Burleigh area. Proposals for enhancing walking and cycling opportunities in the planning area are discussed in Section 4.9. However, opportunities for mountain biking are limited in the planning area. The small size and general lack of suitable terrain within the reserves reduces their value for mountain biking.

Day use park facilities including barbeques, picnic tables, shelters and playground equipment are provided at Council’s recreational parks adjacent to natural area reserves in Schusters Park, Eddie Kornhauser Recreational Reserve, Tarrabora Reserve, Beree-Badalla Reserve and Barlee Court Reserve (Figure 2). A number of other formal recreation parks in the vicinity also provide day use facilities; these parks include Tallebudgera Creek Park, Murlong Park, Mallawa Drive Sports Complex, Bromley Park, Andy Frizzel Park, Laguna Park, Lions Park, Salk Oval Parklands and Bill Thomson Park.

Horse facilities including a dressage arena are present in the south-western sector of Schusters Park and horse riding is allowed in sections of the park. The Gold Coast Horse and Carriage Club Inc. holds a recreational lease over the area.

Tarrabora Reserve, Beree-Badalla Reserve, Currumbin Waters Park, and Schusters Park provide excellent opportunities for nature observation. Walking tracks at Schusters Park (along Tallebudgera Creek) traverse Melaleuca woodland, she-oak open forest, and mangroves and provide visitors good bird watching opportunities. The coastal track and boardwalk that extends from Tarrabora Reserve through Beree-Badalla Reserve provides a very good opportunity for observing coastal ecosystems and associated plants and animals. A management track along the western boundary of Elanora Conservation Reserve allows visitors to experience a eucalyptus woodland setting.
Figure 2. Recreational Facilities in Gold Coast City Council Parks and Reserves in the Elanora-Palm Beach Management Cluster
Water sports, including swimming and surfing, are popular in the area and riparian vegetation protected in reserves along Tallebudgera and Currumbin creeks has an important role in protecting water quality for primary recreation activities. Kayaking and canoeing enthusiasts regularly utilize the lower reaches of Tallebudgera Creek and Currumbin Creek. Access to Tallebudgera Creek for kayaking and canoeing is available at Murlong Park (south bank of creek), Kevin Gates Park (north bank of creek), the Pacific Motorway crossing point (under bridge on the south bank) and at Schusters Park (day use area accessed via Heather Street). Currumbin Creek access is available at Winders Park (south bank of creek) and the Thrower Drive boat ramp.

Individuals and clubs regularly fish the Gold Coast waterways from both shore and by boat. The most common recreational fishing method is line fishing, using rod/reel or handlines. A variety of other fishing methods and practices are also employed including fish netting (e.g. cast, scoop and dip netting), crabbing (e.g. crab traps, pots) and bait gathering (e.g. beach and blood worm collecting, yabbying). Reserves located along Tallebudgera Creek and Currumbin Creek provide good opportunities for shore fishing and stop-over areas for anglers wishing to access shore areas for picnicking etc. Schusters Park is popular with both shore and boat anglers. Boat anglers are able to access picnic and toilet facilities at the park by landing on the sandy beach.

Dog exercise (off-lead) areas are located at Tallebudgera Beach, Palm Beach Parklands, Elanora Oval, Salk Oval, Eddie Kornhauser Recreational Reserve, Schusters Park and Mallawa Sports Complex (Figure 2).

2.3.5 Scientific and education values

The planning area's urban setting combined with the presence of considerable flora and fauna diversity, and a range of ecosystems, provides many opportunities for scientific research and education. For example, the capacity for small reserves such as Wyara Park and Forest Drive Reserve to support koala populations (and those of other plant and animal species) is considered to be of educational and scientific interest.

Community education activities are planned in association with the ongoing restoration program for Schusters Park natural areas. The involvement of school children, community members and persons in the corporate sector will provide individuals with opportunities to learn about and assist ecological restoration practices to be implemented at the site. Additional similar community education programs that promote public involvement in management activities will be implemented as opportunities arise during the life of this management plan.

2.3.6 Social and economic values

The reserves contribute significantly to the lifestyle and well-being of neighbours and nearby residents by offering: places for experiencing the natural environment, visual landscape amenity, space for daily exercise, geographic character and identity. The reserves provide an opportunity for social interactions in natural settings and involvement in community based conservation by working with local landcare groups such as the Elanora Wetlands Bushcare Group, Currumbin Creek Carers Group and Tarrabora Reserve Bushcare Group.

Ecosystems in the reserves provide important ecosystem services such as drinking water catchment protection, carbon sequestration and stabilisation of local climate, stabilising slopes in landslip prone areas, providing habitat for commercially harvested species, nutrient cycling and filtration processes, regulation of the hydrological cycle and seed dispersal for recolonisation and rehabilitation of disturbed areas.
Mangrove communities in the estuarine reaches of the planning area act as nurseries for commercially important fisheries. They also constitute important habitat for molluscs, crustaceans, birds, reptiles and insects. These communities also play an important role in land stabilisation, protection against storm damage and filtration and trapping of sediment and pollutants.

From a tourism and marketing perspective the distinctive landscape features (e.g. creeks, ridgelines, coastline) of the area help to shape a positive arrival experience for tourists and reinforce the clean, green image of the Gold Coast (Aspect 2006) and the “green behind the gold” character of the hinterland. The natural values of the Gold Coast have been identified as a significant driver in attracting people and businesses to the region, providing opportunities for investment, business development and employment (Aspect 2006).

2.4 Climate change

Current observations of global air and ocean temperatures, changing sea levels and melting snow and ice indicate a warming trend for the global climate system (IPCC 2007), with a warming of approximately 0.8 – 1.3 °C recorded in Northern NSW since 1950 (CSIRO 2007). The Australian Government has listed habitat alterations caused by anthropogenic emissions of greenhouse gases as a key threatening process (DSEWPAC 2010b).

Specific impacts of the changing climate are difficult to predict, with simulated climate futures varying considerably in their predictions of variables such as rainfall, wind speeds, relative humidity and storm activity (Bushfire CRC 2006). However, regional changes to climate are likely to have significant impacts on species biodiversity, including changes in species distributions as some species are no longer able to survive in a particular area and others become more competitive and successful (CSIRO 2007). It is anticipated that climate change will influence Gold Coast weather patterns and amplify the occurrence of extreme events like cyclones and heat waves and natural disasters including bushfire, flood and drought (GCC 2009b). Rising sea levels and increases in the severity and frequency of cyclones (and associated storm surges and high winds) could have substantial impacts on reserves along the lower reaches of Tallebudgera and Currumbin Creeks, including Tarrabora Reserve, Beree-Badalla Reserve, Merv Craig Recreational Park, and Schusters Park. These reserves contain intertidal and coastal habitats and may experience an acceleration of natural dune erosion and formation processes. Parts of these reserves fall within the high-medium hazard storm tide inundation area under SPP3/11: Coastal Protection. SPP3/11 requires local government authorities to prepare adaptation strategies for urban areas within high risk coastal hazard area, taking into account the impacts of climate change. Notable changes in the distribution of tidal ecosystems in these reserves may also occur due to rising sea levels. More frequent and severe cyclones (and other storm types) could also impact on the condition of vegetation types in more exposed coastal areas such as dunes and estuaries.

Conservation planning under the influences of climate change needs to be wide-scale as there are limits to what can be achieved at a reserve, or even a regional scale (Hughes and Westoby 1994). Management attempts to maintain conditions that allow for species and ecosystems to adapt to changed environmental conditions that arise from climate change. For example, conservation corridors should span environmental and physical gradients (e.g. elevation) to ensure that species can shift range distributions in response to altered conditions. Protecting large areas of ecosystems is another important strategy aimed at increasing the capacity for species adaptations to occur in the context of more resilient (i.e. healthy) systems.

However, climate change can, to a large extent, exacerbate other threats to biodiversity and management options that can be adopted at the reserve scale to mitigate these threats may in turn maximise the capacity of species and ecosystems to adapt to changing climates (DEC
- NSW 2008, NRMMC 2004). Relevant management options are provided in Section 4 of this plan and include specific actions and guidelines to assist in: building resilience into natural terrestrial and riparian systems through reducing existing threats to biodiversity; ongoing development of an adequate, representative and well connected protected area network; monitoring and research into the impacts of climate change and adaptation options for threatened species and ecosystems; and adapting management systems to incorporate climate change information and associated management tools.

Council’s Climate Change Strategy (GCCC 2009b) has been developed to provide a comprehensive approach to climate change on the Gold Coast. The dynamic nature of the Gold Coast, with around 55 kilometres of coastline, over 260 kilometres of navigable waterways and a historic and anticipated high population growth rate, makes its exposure to climate change particularly unique. The main focus of the Climate Change Strategy is to provide Council and the community with a well-defined direction for responding to climate change risks and challenges and to develop resilience to future impacts. The Climate Change Strategy adopts two broad treatment options to address the risks of climate change: mitigation of the impacts of climate change through reducing the City’s carbon footprint and addition to adaptations to changing circumstances in response to anticipated climate change.

A comprehensive risk response matrix has been developed to identify and prioritise how Council will address climate change risks including bushfire, drought, extreme weather events, impacts on biodiversity and shoreline and riparian management. Additionally, Council’s Climate Change Strategy allows provision for Council’s functions and services to be continually informed by a contemporary understanding of climate change, resulting in ongoing adaptive risk-based management responses. The strategy will be reviewed annually to ensure it is consistent with the most recent and relevant information, science and response methodology available.

3 Management framework

3.1 Legislative and policy framework

3.1.1 Gold Coast Open Space Preservation Levy Acquisition Program

Reserves in the planning area have been acquired by purchase through Council’s Open Space Preservation Levy (OSPL) or by public open space contributions from past developments.

Elanora Conservation Area and Simpsons Road Conservation Area are the only reserves in the planning area that have been purchased with OSPL funds. These reserves were purchased for the primary purpose of nature conservation. The OSPL Acquisition Program contributes to achieving the core objectives of the Gold Coast City Nature Conservation Strategy (GCCC 2009a) by securing the protection of areas of high conservation value in public ownership. One of the major aims of the program is to consolidate and expand the City’s existing protected area network and assist Council in fulfilling the intent of the Conservation Strategy Plan contained within the Gold Coast City Nature Conservation Strategy. Lands acquired with the OSPL are designated by the Gold Coast City Council as Conservation Areas.

The direction of management for the reserves reflects the overarching principle established in the Management Guidelines for sites acquired with the Open Space Preservation Levy (Phase 1 and 2 Acquisition Programs), which indicates that sites purchased with funds derived from the OSPL must: have been acquired primarily for nature conservation, be managed to preserve their significant ecological values, and be used in such a way as not to
negatively impact upon those values (GCCC 2004a). These guidelines describe the actions required for the short-term management of the sites and recommendations for longer term management. Many of the actions or strategies initiated as an immediate action via the guidelines are recommended to continue as actions contained in this management plan.

3.1.2 Gold Coast Planning Scheme and other GCCC policies and guidelines

This section of the plan provides a summary of Council's Planning Scheme and other policies that relate to the conservation reserve network (ie. the planning area). For further detail regarding Council’s conservation management intent on private land, interested parties should consult the relevant sections of the Gold Coast Planning Scheme, including Domain maps, Local Area Plans, Codes and Constraint Codes (and associated Overlay Maps) for Bushfire Management Areas, Cultural Heritage, Natural Wetland Areas and Natural Waterways and Nature Conservation.

3.1.2.1 Domains and Local Area Plans

The Gold Coast Planning Scheme designates the majority of the planning area as Public Open Space Domain. The intent of this Domain is to provide for the protection of land in public ownership for nature conservation, outdoor recreation, landscape preservation, environmental buffers, natural resource management, and natural hazard management purposes. It is intended that all land within the Public Open Space Domain is to be subject to a development concept plan or an integrated management plan which will guide future development.

Elanora Conservation Area, Bronhill Reserve and a portion of Simpsons Road Conservation Area, are located in the Park Living Domain. The intent of Park Living Domain is to provide low-density residential opportunities within a semi-rural landscape, which serves as a transition between more urban and rural areas, whilst maintaining and enhancing a parkland living environment. Amongst the key objectives for the domain are the preservation of landscape character and important topographical features, and the conservation of natural values and wildlife habitat.

Elanora Wetlands Reserve and portions of Schusters Park and Merv Craig Recreational Park are located within the Community Purposes Domain. This domain seeks to retain and reserve appropriate land throughout the City for community purposes and public infrastructure. These purposes and infrastructure encompass social facilities and important physical infrastructure and service establishments that are essential for urban living and often also necessary for rural communities. Community purposes infrastructure may include both public and private services and facilities.

Small sections of Casey Park and Kimmulu Parklands are currently zoned within the Detached Dwelling and Residential Choice Domains, which seek to provide for residential areas. It is anticipated that conservation reserves located within the Park Living, Community Purposes, Detached Dwelling and Residential Choice Domains will be revised or updated to the Public Open Space Domain (or and appropriate conservation zone) during future reviews of the planning scheme and associated zoning (refer to 4.15).

3.1.2.2 Planning Strategy

Whilst the Nature Conservation Planning Strategy within the Gold Coast Planning Scheme (2003) was originally developed in accordance with the Council's 1998 Nature Conservation Strategy, the underlying intent is consistent with and reflected within Council's current NCS (2009-2019 – refer to 3.1.2.4 below). The Nature Conservation Planning Strategy is a mechanism to achieve protection of the City's natural assets through the Planning Scheme
and planning process. Council’s planning scheme is currently under review, due for release in 2014.

The Conservation Strategy Plan, which forms part of the current planning scheme, includes Planning Strategy Map PS-3: Conservation Strategy Plan, and Overlay Map OM20: Conservation Strategy Plan, and provides critical guidance to land use and management decisions within the City’s areas of natural vegetation.

The Conservation Strategy Plan identifies Tarraborra Reserve and Beree-Badalla Reserve as containing significant remnants (remaining vegetation patches). The Conservation Strategy Plan indicates that significant remnants range from small isolated remnants to large areas of relatively intact bushland. They contribute to ecosystem and species diversity, and provide representative samples of vegetation communities across the landscape. It is intended that these areas be retained and enhanced, with further fragmentation and vegetation loss to be avoided. Consolidation of fragments is encouraged and existing natural reserves should be protected against impacts from adjacent development.

The Conservation Strategy Plan also identifies that bushland mosaics are present in Kimmulu Parklands, Bronhill Reserve, Calcita Avenue Reserve, Forest Drive Reserve, Eddie Kornhauser Recreational Reserve, Elanora Conservation Area, Buckingham Way Reserve, Simpsons Road Conservation Area, Casey Park, Raleigh Terrace Reserve, Simpsons Road Reserve and on adjacent private properties. Bushland mosaics are often large, and may support significant vegetation associations or species of conservation significance. For example, the above listed reserves (and vegetation on adjacent properties) support a significant koala population. Bushland mosaics provide habitat for a diversity of fauna, and provide stepping stones for fauna movement between large areas of habitat. The Gold Coast Planning Scheme (2003) Constraint Code for Nature Conservation states that, it is intended that these areas be retained and enhanced, wherever possible, through the use of sympathetic development designs and layouts. Further fragmentation and vegetation loss is to be avoided, and consolidation of fragments will be encouraged during the development process. Existing natural reserves should be protected against impacts from adjacent development.

The City Image and Townscape Planning Strategy within the Gold Coast Planning Scheme provides an overall framework for the built form of the City that aims to retain and enhance the Gold Coast’s physical features and its distinctive built form. Key elements and relationships of the City’s landscape and form are shown on Planning Strategy Maps which highlight the predominantly urban form of the City, and the major views and key elements that contribute to visual quality and primary scenic routes and gateways.

Planning Strategy Map 11 – Urban Form identifies the urban-rural interface in the area and depicts a transition from “Suburban Estates” character to “Rural Hinterland Areas” character in the south-western portion of the management cluster.

Planning Strategy Map 13 – Visual Quality identifies Currumbin Estuary as a “timeless gateway” feature. Timeless gateways are the significant natural entry points into the various parts of the City that help shape an arrival experience. They comprise landscape features that should always be perceived as gateways protected from significant change, and strengthened over time. Planning Strategy Map 13 also identifies ridgeline and hill features in the south-central section of the management cluster and the coastal foreshore areas as “visual city edge features” that support “major visually significant remnant vegetation”. Visual city edges are important physical elements which assist in strengthening the elevated topographical areas of the hinterland. They should continue to be experienced as a continuous green backdrop and silhouette on the skyline. The natural coastal ecosystems and landforms (dunal areas, coastal cliffs, headlands and estuaries) should retain a clear natural character. Areas of “major visually significant remnant vegetation” have retained
ecological and visual value in areas of rapidly altering landscape. The landscape character of these areas is strongly defined by the remnant vegetation, which should be carefully integrated into any future development, through landscape work and the retention of open space areas.

Planning Strategy Map 14 – Major Scenic Routes indicates that the sections of Tallebudgera Creek Road and Currumbin Creek Road within the management cluster are the eastern-most segments of major scenic routes that extend further west along these roads.

3.1.2.3 Priority Infrastructure Plan

The planning area falls within the Palm Beach, Elanora, and Currumbin Waters Statistical Local Areas (SLAs), which cover portions of the southern region of the City. Population estimates associated with the Gold Coast Planning Scheme’s Priority Infrastructure Plan indicate that the population of these SLAs are expected to increase by approximately 11.5 percent (4,558 people) in 2021 (based on 2004 figures). It is anticipated that this population influx will correspondingly result in increasing impacts and demands on the reserves.

3.1.2.4 The Gold Coast City Nature Conservation Strategy 2009-2019

The vision of the Gold Coast City Nature Conservation Strategy 2009 – 2019 (NCS) is “to provide a framework for Council to conserve the City’s biodiversity and to protect a viable city-wide conservation network in partnership with the community and other agencies. The strategic objective of the strategy is to ‘conserve the City’s biodiversity and natural assets through Council’s overarching and strong commitment to protecting, managing and restoring a diverse, connected and viable conservation network across public and private lands.”

The strategy sets two targets that will be used to measure its success:

- 50 percent of the City’s land area will be covered by native vegetation in 2019 (no net loss)
- 55 percent of the City’s land area will be covered by native vegetation in 2040 (net gain)

There are a number of strategic outcomes in the strategy, and one of these is: “Adaptive management that responds to risks such as climate change is applied in administering Council’s natural area reserve system.” In order to achieve this strategic outcome, a number of key actions have been laid down.

The following strategic intents are mandated by the NCS for conservation units (see Conservation Strategy Map, page 14 of the NCS) that are in the planning area:

- **Significant Urban Biodiversity – Substantial Remnants**: remnant vegetation in the south-central section of the planning area has been designated as ‘Substantial Remnants’ under the NCS. The strategic intent for these areas is to retain and enhance the diversity, extent and condition of terrestrial and aquatic habitats within substantial remnants in urban areas by avoiding and managing impacts arising from pests, fire, unauthorised vehicle access, fragmentation and other edge effects resulting from their urban context. A recent study (Ecosure 2011) has refined the boundaries of the city’s key substantial remnants and developed a prioritised toolbox of conservation management recommendations at a property scale.

- **Significant Urban Biodiversity – Urban Conservation Mosaic**: the majority of the planning area is designated ‘Urban Conservation Mosaic’ under the NCS. Strategic intents of the NCS for these areas are: 1) conserve the ecological diversity of the urban areas by protecting and restoring endangered and locally endangered regional ecosystems, restoring priority sites, and retaining and connecting vegetation corridors...
to nodes of habitat and, 2) work with residents to create an active, involved and aware community that appreciates the City’s natural values and supports nature conservation, either through direct involvement in action or through the support of Council and others.

- **Critical Corridors – Hinterland-Coast:** reserves and adjacent areas along Currumbin Creek are designated part of a ‘Hinterland-Coast’ critical corridor (i.e. Currumbin Corridor). Strategic intents relevant to these areas are: 1) conserve the ecological function of corridors to provide for the movement of flora and fauna and provide opportunities for species adaptation to climate change, 2) improve ecological connectivity through retention of existing vegetation and restoration of degraded areas in strategic locations, and 3) conserve habitat for threatened species and poorly conserved vegetation types.

Key Action 23 of the NCS is: "Natural area reserve management: develop and implement reserve management and associated operational plans. Undertake flora and fauna surveys of acquired areas to inform management actions". This management plan directly addresses Key Action 23 of the NCS.

### 3.1.2.5 Other GCCC policies and guidelines

The provisions of a number of other GCCC policies and guidelines have been considered in the development of this management plan. These include: *Gold Coast City Council Local Laws, Gold Coast City Bushfire Management Strategy 1998, City of the Gold Coast Pest Management Plan 2006-2010, Our Natural Playground: A Parks and Recreation Plan for the Gold Coast, Gold Coast City Climate Change Strategy 2009-2014, Gold Coast Shoreline Management Plan 2008 and the Gold Coast City Council Corporate Plan 2009-14.*

An Interim Management Plan (IMP) was prepared for the planning area in 2006. This plan was designed to provide an overview of the planning area’s key values, threatening processes, management objectives and management strategies. It provides interim guidelines for a range of land management operations including: landscape, soils and catchment protection; native plants and animals; bushfire management; pest plants and animals; cultural heritage; recreation and interpretation; and neighbours, surrounding land uses and future development. Having been prepared in accordance with the intent of this interim document, the adoption of this management plan supersedes the IMP for the planning area.

The day to day operations of NAMU, which is the asset custodian for Council’s conservation reserves, is guided by the *Natural Areas Management Unit Business Plan 2008-2011.* Implementation and prioritisation of management actions and guidelines given in this management plan will be in accordance with the *Natural Areas Management Unit Business Plan.*

### 3.1.3 Strategies for South East Queensland

#### 3.1.3.1 South East Queensland Regional Plan

The *South East Queensland Regional Plan 2009-2031* (SEQ Regional Plan) (Office of Urban Management 2009) provides a sustainable growth management strategy for South East Queensland. Within this strategy, the planning area falls almost entirely (greater than 95 percent) within the Urban Footprint area, as defined by the SEQ Regional Plan. The Urban Footprint aims to accommodate the full range of urban uses, such as housing, industry, business, infrastructure, community facilities and urban open spaces. The Urban Footprint does not imply that all included land can be developed for urban purposes. For example, native vegetation and wetlands will continue to be protected under state and federal legislation such as the Nature Conservation Act, EPBC Act and the Fisheries Act. Land in the
Urban Footprint may also be unsuitable for urban development for a range of local-scale reasons including constraints such as flooding, slope gradient, scenic amenity and the need to protect biodiversity values of city or regional significance.

The SEQ Regional Plan identifies areas of high terrestrial and wetland significance in Tarrabora Reserve, Beree-Badalla Reserve, Merv Craig Recreational Park, Currumbin Waters Park, Simpsons Road Conservation Area, Simpsons Road Reserve, Buckingham Way Reserve, Calcita Avenue Reserve, Kimmulu Parklands, Eddie Kornhauser Recreational Reserve, and Schusters Park.

3.1.3.2 State Planning Policy 2/10: Koala Conservation in South East Queensland

State Planning Policy 2/10: Koala Conservation in South East Queensland (SPP 2/10) (DERM 2010a) is a planning instrument that came into effect on 31 May 2010. The aim of this policy is to “ensure that koala habitat conservation is taken into account in planning processes within the South East Queensland Koala Protection Area, contributing to a net increase in koala habitat in south-east Queensland, and assist in the long term retention of viable koala populations in south-east Queensland” (DERM 2010a).

A key goal of SPP 2/10 is to maintain the viability of all major koala populations across the region by increasing the size of their habitat. To achieve this, the SPP requires that planning must:

- identify koala habitat values within the planning scheme areas using the SEQ Koala Habitat Values Map and additional mapping information
- protect significant areas of koala habitat value
- retain and enhance habitat connectivity to maintain koala population viability
- maximise koala safety and movement through design and layout of development
- achieve a net gain in bushland habitat through the use of environmental offsets and other mechanisms

The SPP 2/10 SEQ Koala Protection Area Koala Habitat Values Map indicates that koala habitat areas in the planning area are high and medium value bushland or have medium to high restoration value.

All management actions identified in this management plan are consistent with the Regional Nature Conservation Strategy for South East Queensland 2003-2008 (EPA 2003). The strategy sets the regional framework for nature conservation, and has been endorsed by State and Local governments and establishes agreed processes for assessing, protecting and managing nature conservation and biodiversity values in South East Queensland. Furthermore, management actions are consistent with the targets and objectives of other relevant regional natural resource management plans including the South East Queensland Natural Resource Management Plan 2009-2031/South East Queensland Regional Water Quality Management Strategy/South East Queensland Regional Coastal Management Plan 2006.

3.1.3.3 State Planning Policy 3/11: Coastal Protection

The majority of the planning area, with the exception of Simpsons Road Reserve and Tallebudgera Connection Road Reserve, are within the coastal zone, managed under Queensland Coastal Plan 2012 through State Planning Policy 3/11: Coastal Protection (SPP 3/11) and the State Policy for Coastal Management. SPP 3/11 applies to all planning and assessment decisions on land within the coastal zone, made under the Sustainable Planning Act 2009 (SPA). The State Policy for Coastal Management provides policy and guidance for managers of coastal land, where land management activities do not constitute development under the SPA.
All or part of the land in Tarrabora Reserve, Beree-Badalla Reserve, Schusters Park, Elanora Wetlands, Eddie Kornhauser Recreational Reserve, Elanora Conservation Area, Breynia Court Reserve, Forest Drive Reserve, Buckingham Way Reserve, Calclita Avenue Reserve, Bronhill Reserve, Kimmulu Parklands, Merv Craig Recreational Park, Currumbin Waters Park, Simpsons Road Conservation area, Casey Park, Raleigh Terrace Reserve, Pardalote Place reserve, Riverglenn Park and Coastal Meadows Park is designated at being of High Ecological Significance (HES) under SPP3/11. The SPP requires that development be located outside of – and not impact on – areas of HES; or, for specified development activities, where impacts cannot be avoided, development must minimise and offset any residual impacts. Beree-Badalla Reserve is also indicated as a fish habitat area, and Coastal Meadows Park as a strategic rehabilitation area.

In addition much of the land, including Council conservation parks, along the lower reaches of Tallebudgera and Currumbin Creeks is indicated as high-medium hazard storm tide inundation area.

3.1.4 State land held under trusteeship – Queensland Land Act 1994

Under the Queensland Land Act 1994, unallocated State land may be dedicated as a reserve for a community purpose as defined under Schedule 1 of that Act, with a trustee appointed to manage the trust land. The trustee must have some particular association or expertise with the trust land and it’s purpose, or with the local community and in a way that is consistent with the purpose for which the reserve was dedicated. Council is an appointed Trustee for most of the reserves in the management cluster (see Appendix A).

3.1.6 Other relevant legislation

Management of the planning area must be consistent with the provisions of all relevant State and Commonwealth legislation, including acts, regulations and international agreements. Table 5 outlines the primary legislative framework under which Council has management obligations. This addresses those measures which are most directly relevant to management planning for the area and may be subject to change through amendments, repeal, or the creation of new legislation. For a more comprehensive list of legislation applicable to the management of the planning area, refer to Appendix B of Council’s Conservation Areas Management Planning Framework for sites acquired with funds from the Open Space Preservation Levy (GCC 2004a).

Table 5. Relevant State and Commonwealth legislation and International agreements to the management of the planning area

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Legislation</th>
<th>Description</th>
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<tbody>
<tr>
<td></td>
<td>Nature Conservation (Wildlife) Regulation 2006</td>
<td>Establishes declared management intents for classes of protected wildlife that include addressing threatening processes through recovery plans and conservation plans.</td>
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<td></td>
<td>Vegetation Management Act 1999</td>
<td>Provides for the protection of remnant vegetation.</td>
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<tr>
<td></td>
<td>Aboriginal Cultural Heritage Act 2003</td>
<td>Ensures protection of Aboriginal cultural heritage values and requires those conducting activities in significant areas to take all reasonable and practical measures to avoid harming cultural heritage.</td>
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<tr>
<td>Jurisdiction</td>
<td>Legislation</td>
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<td></td>
<td><strong>Land Protection (Pest and Stock Route Management) Act 2002</strong></td>
<td>Requires eradication, control or containment of declared weeds and animals on Council-managed land.</td>
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<tr>
<td></td>
<td><strong>Fire and Rescue Services Act 1990</strong></td>
<td>Requires a reduction of fire risk on Council-managed land and management measures to ensure that fire does not impact upon neighbouring properties.</td>
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<td></td>
<td><strong>Fisheries Act 1994</strong></td>
<td>Provides for the protection of mangroves and other marine plants on tidal lands. Designates the Beree-Badalla Reserved as a Declared Fish Habitat Area for the protection of inshore and estuarine fish habitats.</td>
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<tr>
<td></td>
<td><strong>Environmental Protection Act 1994</strong></td>
<td>Provides for ecologically sustainable development.</td>
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<tr>
<td></td>
<td><strong>Sustainable Planning Act 2009</strong></td>
<td>In conjunction with the <em>South East Queensland Regional Plan 2005</em> and the Integrated Development Assessment System, provides direction for infrastructure development and triggers for referrable wetlands.</td>
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<td></td>
<td><strong>Water Act 2000</strong></td>
<td>Provides for protection and sustainable management of water resources.</td>
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<td></td>
<td><strong>Local Government Act 2009</strong></td>
<td>Provides for environmental management in accordance with Council’s <em>Parks and Reserves Law</em> (Local Law 9).</td>
</tr>
<tr>
<td></td>
<td><strong>Queensland Heritage Act 1992</strong></td>
<td>Provides for the conservation of Queensland’s cultural heritage.</td>
</tr>
<tr>
<td></td>
<td><strong>Queensland Workplace Health and Safety Act 1995.</strong></td>
<td>Provides for safe access and work within reserves.</td>
</tr>
<tr>
<td></td>
<td><strong>Environment Protection and Biodiversity Conservation Act 1999</strong></td>
<td>Provides for the protection of federally threatened species and ecosystems, the identification of key threatening processes and the preparation of recovery plans and conservation agreements. Any action that will have, or is likely to have, a significant impact on matters of national environmental significance (e.g. threatened or migratory species, threatened ecological communities, Ramsar wetlands, world heritage properties) requires approval under the Act.</td>
</tr>
<tr>
<td></td>
<td><strong>Directory of Important Wetlands in Australia (Australian Nature Conservation Agency 2001)</strong></td>
<td>Identifies and provides information on the values of 851 nationally important wetlands in Australia.</td>
</tr>
<tr>
<td></td>
<td><strong>Japan-Australia, China-Australia Migratory and Korea-Australia Bird Agreements (JAMBA, CAMBA and ROKAMBA)</strong></td>
<td>Encourages habitat protection for migratory birds listed in the agreements.</td>
</tr>
<tr>
<td><strong>Commonwealth</strong></td>
<td><strong>Convention on the Conservation of Migratory Species (CMS) of Wild Animals (Bonn Convention)</strong></td>
<td>A multi-lateral treaty that seeks to foster international cooperation for the conservation of migratory species.</td>
</tr>
</tbody>
</table>
3.2 Specific management objectives for the Elanora-Palm Beach management cluster

The planning area will be managed to maximise its connectivity and ecological viability. The conservation and protection of its environmental, scenic, catchment and cultural heritage values will be paramount. This will be achieved through the provision of opportunities for low-impact sustainable nature-based public use, targeted interpretation and educational material, and responsive ecological management. The following objectives have been identified as essential to achieving these strategic outcomes.

- Manage the planning area within the context of a broader interrelated reserve system.
- Maintain and enhance viable habitat corridors contributing to the ecological richness of the region.
- Maintain geologic and geomorphologic features, landscape values and natural biophysical processes.
- Protect and enhance the diversity, integrity and viability of indigenous flora and fauna communities, particularly those identified as significant or threatened.
- Protect and monitor threatened and biogeographically significant species and their habitats.
- Undertake ecological restoration to repair the structure and integrity of degraded ecosystems and improve habitat function.
- Control pest plant and animal species.
- Implement fire management strategies that protect life and property, whilst ensuring the diversity and function of natural communities is maintained.
- Protect catchment values of Tallebudgera Creek and Currumbin Creek – in particular, aquatic ecosystem health and the supply and purity of drinking water.
- Protect and improve public appreciation of Aboriginal and European heritage sites and values and involve traditional owners in cooperative management of indigenous cultural heritage values.
- Provide opportunities for safe and sustainable nature-based recreation consistent with the protection of natural and cultural values.
- Provide opportunities to improve active and healthy lifestyles of Gold Coast residents, for example through the Gold Coast Active and Healthy Program, and through active travel networks in appropriate and sustainable locations
- Develop recreational infrastructure that does not impact on scenic amenity values.
- Engender greater public awareness and appreciation for the values and management of the planning area.
- Encourage and facilitate scientifically rigorous research and monitoring to improve knowledge of natural and cultural values of the area, and provide feedback into the ongoing strategic management of reserves.
- Manage impacts of pre-existing land uses, such as grazing, in a manner that supports and maintains natural and recreational values.
- Develop and maintain strong relationships with neighbours, authorities, Government departments, other Council land and/or asset managers and other key stakeholders to enhance the protection, viability and integrated management of the area.
- Ensure potential impacts of climate change ie. storm surge, erosion, sea level rise are translated into management actions or considerations for future management of the Elanora-Palm Beach reserves.
- Adaptive management principles will be applied to all management guidelines and actions of this plan.
- Manage in accordance will all relevant legislation and policy.
4 Management strategies for the Elanora-Palm Beach Reserves

4.1 Landscape protection

4.1.1 Current management situation

The Currumbin Corridor extends from the Tallebudgera and Currumbin valleys, east to the planning area. The functionality of the corridor is limited by the presence of a number of physical barriers including the Tallebudgera Connection Road (Chenoweth 2010). Roads and utility infrastructure corridors can act as substantial barriers to fauna movement. The extent to which such barriers affect fauna movement is dependent on a number of factors including:

- width of the barrier (road/utility easement)
- amount, structure and type of vegetation present in and directly adjacent to the barrier
- opportunities for safe passage across the barrier (e.g. places of canopy connectivity, bridge or culvert crossing points)
- the ability of particular species to safely transit the barrier based on factors such as mobility and tolerance for environmental conditions associated with the barrier (e.g. increased temperatures, reduced vegetation cover)

It is likely that the Tallebudgera Connection Road, which is managed by the Queensland Department of Transport and Main Roads (DTMR), is having a negative effect on the koala meta-population that inhabits areas east of the road. There is potential for Council to work with DTMR to investigate opportunities for enhancing connectivity between koala populations (and those of other species) east and west of the road, for example by upgrading existing culverts to improve fish and wildlife passage, installing guide fencing, improving canopy connectivity, habitat restoration and replacement (or removal) of non-fauna friendly fencing (Chenoweth 2010).

The strategic value of properties within the corridor was assessed by Chenoweth (2010) to identify properties that are critical to the functionality of the Currumbin Corridor. Forty properties were identified as having Very High Strategic Value and 88 properties were identified as having High Strategic Value (Chenoweth 2010). The results of this strategic value assessment are considered by Council when considering potential opportunities for expanding of the conservation reserve network. Properties in the vicinity of Tallebudgera Connection Road Reserve (i.e. both east and west of the road) that are vegetated with eucalypt woodland are considered to have critical strategic value for maintaining the functionality of the Currumbin Corridor.

Under the Gold Coast Planning Scheme, the management intent for visually prominent landscape features is to strengthen these features over time through retention of vegetation and minimisation of development. The most important physical features of the City that warrant protection for nature conservation and/or landscape reasons, as defined in the Planning Scheme, are the mountains, ridges, valleys, river systems, wetlands and coastal systems (GCCC 2007a).

The removal of vegetation for view enhancement is, unfortunately, an ongoing issue in the planning area. Areas adjacent to Simpsons Road Conservation Area were cleared by an adjoining land owner to improve views toward the coast. Council appreciates the cooperation of residents in identifying unauthorised vegetation clearing (both in and outside the reserves). Subsequent investigations are greatly assisted by photographic records.
Encroachments into reserves from private neighbouring properties is also a management issue and potentially a key threatening process for landscape values. Encroachment of fences, sheds, lawn areas and home extensions have occurred at a number of reserves (e.g. Simpsons Road Conservation Area, Avocado Park, Casey Park, Riverglenn Park, Tallebudgera Connection Road Reserve).

Likely areas of moderate slope instability hazard are present along the steep slopes and ridgelines in the south-central section of the management cluster. These moderate risk areas encompass portions of Avocado Park, Wyara Park, Kimmulu Parklands, Bronhill Reserve, Forest Drive Reserve, Elanora Conservation Area, Simpsons Road Conservation Area, Casey Park and Simpsons Road Reserve. No historic landslips have been recorded in the planning area. The degradation of native vegetation (particularly woody vegetation) through development, encroachment, inappropriate use of fire and informal track construction increases the vulnerability of the reserves to severe erosion events. Where a moderate or higher slope instability hazard exists, maintaining vegetation cover can be a critical factor in slope protection.

The northern portions of the Elanora Conservation Area management track are subject to active erosion. Track improvements (such as installation of whoa boys and outlets) are planned to improve drainage diversion along the track and achieve reduced erosion.

Scenic amenity management of the reserves will focus on the protection and enhancement of existing landscape values through retention and rehabilitation of vegetation, acquisition of additional naturally vegetated land (where possible), appropriate location of built infrastructure, and other environmentally sensitive management techniques.

4.1.2 Desired outcomes

- Significant landscape and scenic features within the planning area are protected and enhanced.
- Visual impacts on the natural landscape, especially from major viewing points, are minimised.
- Infrastructure complements and does not detract from the natural landscape.
- Geological hazards, soil erosion and slope instability are minimised and prevented where possible.
- Geological and soil landscapes are protected from human induced disturbance.

4.1.3 Management strategy

4.1.3.1 Guidelines

G1.1 Limit clearing of native vegetation in the planning area to that necessary for essential statutory and operational requirements.

G1.2 Ensure that reserve facilities and built infrastructure are located and designed to minimise their visual impact within the landscape.

G1.3 Ensure that the construction and maintenance of reserve facilities (including walking tracks), visitor use and management actions do not adversely impact on geological and soil conditions, sensitive vegetation or restoration areas.

G1.4 Locate new built infrastructure and facilities outlined in this plan on previously disturbed sites wherever possible, outside areas of moderate-high slope instability hazard, at appropriate setbacks to unstable slopes and with appropriate drainage, as defined by the relevant engineering/geotechnical assessments where necessary.
G1.5 Implement appropriate sediment and erosion control measures during all works conducted within the planning area. For major works, an erosion hazard assessment is to be conducted and where necessary, an Erosion and Sedimentation Control Plan prepared.

G1.6 Where risk of landslip is identified on or adjacent to reserves during routine ranger patrols, this should be reported to the relevant Council department, eg. Engineering Services (for Council assets) or Development Compliance (for private land).

G1.7 Fence unstable slopes where necessary (e.g. where there are risks to human safety, soil erosion, or sensitive vegetation communities).

G1.8 Support the acquisition of vegetated and visually prominent properties within the management cluster through Council’s Open Space Preservation Levy.

G1.9 NAMU to provide stakeholder input into planning applications concerning land adjoining conservation reserves to ensure that future developments complement and protect significant scenic, landscape and recreational in the reserves.

4.1.3.2 Actions

A1.1 Undertake periodic site visits to monitor illegal vegetation clearing and other encroachment activities adjacent to the reserves. Report new encroachments to the coordinator of the Natural Areas Management Unit for appropriate action.

A1.2 Upgrade the Elanora Conservation Area management track to improve track stability and reduce erosion.

A1.3 Where identified, close and rehabilitate informal walking and mountain bike tracks that do not form part of the strategic recreational tracks network for the planning area (refer to Section 4.10).

A1.4 Council’s environmental planning officers to implement priority recommendations of the Currumbin corridor study (Chenoweth 2010).

A1.5 Through ranger patrols, encourage neighbouring residents to protect and retain native vegetation in and adjoining the planning area.

4.1.4 Key monitoring priorities

- Monitor reserve boundaries for private encroachments and unauthorised vegetation clearing.
- Monitor sediment and erosion control measures used during any operational works so that any additional management requirements can be identified and implemented immediately.
4.2 Catchment management

4.2.1 Current management situation

The reserves are located in the downstream sections of the Tallebudgera Creek andCurrumbin Creek catchments; the ridgelines and hills oriented from south-west to north-east through the management cluster form the boundary between these catchments. Each of these catchments contains two distinct systems: freshwater and estuarine. Estuarine and tidally influenced systems predominate in the cluster with a larger proportion of freshwater influence in the upstream sections of Currumbin Creek in the southern portion of the cluster. The Elanora-Palm Beach conservation reserves contribute to the preservation of the environmental values of these catchments.

The Tallebudgera Creek Catchment Management Plan (Tallebudgera Creek CMP) was developed to formulate strategies aimed at protecting the environmental values of the creek such as aquatic ecosystems, primary, secondary and visual recreation and human consumption (Australian Wetlands 2006). The Tallebudgera Creek CMP provides a strategic approach for mitigating the potential sources of pollution and activities that are detrimental to the creek’s environmental values. These strategies focus on the development and implementation of a Riparian and Instream Management Plan, enhancement of instream and creek bank stabilisation, control of nutrient inputs, maintenance of water quality for recreational use and a range of other catchment management initiatives. Significant restoration work was identified as being required in order to develop a riparian buffer system which adequately protects water quality in the catchment.

Sections of Tallebudgera Creek in and upstream of Schusters Park are exhibiting lateral bank instability (Australian Wetlands 2006). This instability could eventually cause bank failure and cut off of the peninsula, forming an island. The eroding section is near to the day use area and provides access to the peninsula section of the park, which is well-used by the local community. The Tallebudgera Creek CMP identifies this area as a high priority restoration site. Part 3 of the Tallebudgera Creek CMP identifies specific stream restoration targets and actions for sections of the creek that run through Schusters Park and Elanora Wetlands Reserve, which need to be reviewed and implemented at a whole of catchment scale.

The Schusters Park remnant oxbow (billabong), located adjacent to the (Rotary Park section) day use area, is thought to have become completely isolated (through natural processes) from the main channel of Tallebudgera Creek prior to the initiation of farming practices in the area. While isolated from the main channel, the billabong supported a freshwater ecosystem including *Melaleuca* spp., and sedges (e.g. *Juncus* spp.). A narrow drain connecting the billabong to the main channel was subsequently excavated and this drain and portions of the billabong became predominantly vegetated with grey mangrove (*Avicennia marina*). Tidal flows through the narrow drain have recently decreased due to sedimentation of the drain and high densities of grey mangrove. The area is now returning to a freshwater system, resulting in occasional increased densities of the aquatic weed *Salvinia molesta*, and higher levels of potentially hazardous blue-green algae. Council’s catchment management officers have assessed the site and determined that, while flow gradients along the drain are insufficient to allow increased tidal flushing of the billabong, there may be opportunities to mitigate pooling of stagnant water in the drain itself, which would reduce odours caused by anaerobic decay of organic matter at this site.

Sections of Currumbin Creek located in the management cluster are tidal. The Currumbin Creek Catchment Study (GHD 2004) included an assessment of bank condition for sections of the creek in the tidal zone. The creek bank along Currumbin Waters Park is exhibiting medium low bank stability and Council’s catchment management officers are currently investigating the feasibility of implementing bank stability measures in this area. Creek banks
in and upstream from Coastal Meadows Park, Riverglenn Park and Tarrabora Reserve were
found to have medium bank stability, and banks along Merv Craig Recreational Reserve and
Beree-Badalla Reserve are exhibiting medium to high stability. The Currumbin Creek
Catchment Study (GHD 2004) did not provide recommendations regarding the prioritisation
for restoration works for estuary sections of Currumbin Creek. However, it is likely that areas
exhibiting lower bank stability represent areas of higher creek bank restoration priority (refer
to section 4.6.3 – Restoration Management Strategies).

In natural settings, instream and riparian vegetation aids in the reduction of flood velocities
and stream bank erosion by dissipating floodwaters over adjacent floodplains. However, land
uses in floodplain areas such as urban and rural development often lead to reduced
vegetation cover along creek banks, increased stream flow velocities, bank scour and bank
instability. These factors highlight the importance of maintaining suitable vegetation cover
along stream banks. Where possible, a minimum functional, vegetated riparian corridor width
of 60 metres (measured from each high bank) is recommended for areas in reserves (and
recreational parks) along Tallebudgera and Currumbin creeks.

Schusters Park, Tarrabora Reserve, Beree-Badalla Reserve, Merv Craig Recreational Park,
Currumbin Waters Park, Riverglenn Park, Coastal Meadows Park and sections of Eddie
Kornhauser Recreational Reserve are within the 1 in 100 year riverine and/or storm surge
inundation area. These reserves experience periodic flooding events and vegetation
communities in these areas have adapted to flood related disturbance. Current flood
modelling indicates that approximately 57 percent of the planning area becomes inundated
during a Q100 event. Given the frequent occurrence of flood flows in the planning area,
areas of low bank stability need to be considered during the prioritisation of restoration
activities in the reserve network.

Council’s catchment management officers are implementing standardised Riparian and In-
stream Rapid Assessments (RIRA) of key waterways throughout the city to provide baseline
data for monitoring waterway condition and identifying management priorities. RIRA data
may be a useful resource for monitoring effectiveness of management activities, restoration
prioritisation and feasibility assessments for future proposed works.

Council’s Acid Sulfate Soil hazard mapping indicates that actual or potential Acid Sulfate
Soils (ASS) are present in the planning area. Areas most likely to contain ASS are below 5
metres elevation. Substantial risk for ASS has been identified for the majority of areas in
Schusters Park, Merv Craig Recreational Park and Currumbin Waters Park. Areas in Eddie
Kornhauser Recreational Reserve are also likely to contain ASS. Disturbance (through
drainage or exposure) to ASS may result in acidic runoff and groundwater contamination,
which may detrimentally impact on the planning area’s water quality and aquatic ecology
values.

4.2.2 Desired outcomes

- Catchment values, riparian condition, water quality and the health of waterways are
  maintained or improved.
- Degraded riparian and in-stream areas are rehabilitated to enhance riparian and aquatic
  ecosystem health, including water quality.
- Sustainable access to waterways is maintained and improved where necessary.

4.2.3 Management strategy

4.2.3.1 Guidelines

G2.1 Management activities are to minimise impact on water quality and natural drainage
patterns and ensure no net worsening of flood mitigation measures.
G2.2 All new built infrastructure to be located at appropriate setbacks, as determined by a thorough feasibility assessment, to waterways and ephemeral flow paths.

G2.3 Recreational vehicle and pedestrian access to be located at designated and formalised points, only where considered sustainable and environmentally appropriate.

G2.4 Management actions and outcomes associated with waterways are in accordance with the provisions of the *Environmental Protection (Water) Policy 2009*, State Planning Policy 4/10 Healthy Waters (2010), the Tallebudgera Creek CMP, the Currumbin Creek Catchment Study and the *South East Queensland Regional Water Quality Management Strategy* (Healthy Waterways 2001).

G2.5 Where geomorphic assessments identify significant erosion along the banks of waterways within the planning area, in conjunction with Council’s catchment management officers, implement management strategies to mitigate causative agents and remediate existing damage. Areas in which bank stability may compromise public safety should be assigned the highest priority.

G2.6 Minimise use of herbicides and fertilisers near water bodies. Under circumstances in which it is necessary to use chemical weed control methods in close proximity to water bodies, ensure that only herbicides appropriate for use within aquatic and sensitive environments are applied.

G2.7 Consider the potential impact of ASS on all activities which involve earthworks or changes to local hydrology. Within areas identified as having actual or potential ASS, all works must be conducted in accordance with State Planning Policy 2/02: *Planning and Managing Development Involving Acid Sulfate Soils*.

G2.8 NAMU to be consulted as a stakeholder in regard to catchment management initiatives occurring in waterways in or adjacent to the planning area.

4.2.3.2 Actions

A2.1 Natural areas management and catchment management officers to implement works (regrade drain and install a larger culvert) to mitigate pooling of stagnant water in drain connecting Schusters Park oxbow with Tallebudgera Creek.

A2.2 Catchment management and NAMU officers to further investigate high priority restoration sites in Schusters Park that were identified in the Tallebudgera Creek CMP.

A2.3 Assess the condition (and use level) of formal and informal tracks and stream-side areas in reserves that are used to access waterways; repair/formalise access tracks and areas where necessary to reduce damage to riparian communities.

4.2.4 Key monitoring priorities

Note: Council’s catchment management officers carry out routine monitoring of waterways (water quality and ecosystem condition) throughout the city and can provide input/assistance into monitoring priorities listed below.

- Use of appropriate management measures (e.g. sediment and erosion controls) to protect waterway values during any works conducted in the vicinity of waterways.
- Impact of riparian restoration on waterway condition. Riparian and In-stream Rapid Assessments are an appropriate tool for this and would allow standardisation of data with similar monitoring conducted by catchment management officers throughout the city.
• Impacts of illegal/inappropriate waterway access and effectiveness of strategies used to mitigate this.

4.3 Native flora

4.3.1 Current management situation

The floristic diversity in the planning area is closely associated with landscape elements such as landform, topography, aspect and soils, climatic factors and current and historic land uses. The complexity of factors influencing vegetation composition makes communities highly susceptible to change, as evidenced by the changes in vegetation condition that have occurred since European colonisation. Within a management context, it is important to consider both the vulnerability of vegetation to long-term environmental change, and the possible negative impacts of shorter-term or periodic processes such as bushfire and recreational use.

Regional ecosystems (REs) listed as Endangered or Of concern are present in the planning area. Regional ecosystems are declared in the Vegetation Management Regulation 2000 (a subordinate of the Vegetation Management Act 1999) and are classified as:

- **Endangered if:**
  - the area of remnant vegetation for the regional ecosystem is less than 10 percent of the pre-clearing extent of the regional ecosystem; or
  - the area of remnant vegetation for the regional ecosystem is 10 to 30 percent of the pre-clearing extent of the regional ecosystem and less than 10,000 hectares

- **Of concern if:**
  - the area of remnant vegetation for the regional ecosystem is 10 to 30 percent of the pre-clearing extent of the regional ecosystem; or
  - the area of remnant vegetation for the regional ecosystem is more than 30 percent of the pre-clearing extent of the regional ecosystem and less than 10,000 hectares

Based on the above criteria, it is clear that Of concern and Endangered REs have experienced severe clearing or are naturally limited in extent and thus warrant protection. Reasonably large patches of Blackbutt open forest (RE 12.11.23) (VM Act – Endangered) are present in Kimmulu Parklands, Bronhill Reserve, Calcita Avenue Reserve, Forest Drive Reserve, Eddie Kornhauser Recreational Reserve, Simpsons Road Conservation Area, and Casey Park. This RE has been extensively cleared and fragmented by urban development. Weed invasion and high densities of brush box (*Lophostemon confertus*) are recognised threatening processes for this RE.

Narrow patches of gallery rainforest (RE 12.3.1) (VM Act – Endangered) are present at Coastal Meadows and River Glenn Park. This vegetation type exhibits high biodiversity and may provide habitat for rare and threatened flora and fauna species including macadamia nut (*Macadamia integrifolia*), rusty rose walnut (*Endiandra hayesii*) and Richmond birdwing butterfly (*Ornithoptera richmondi*a). It is also important for many fruit-eating birds, many of which migrate seasonally from upland to lowland rainforest. It is likely that weed infestations are compromising the condition of these areas and reducing habitat value.

*Casuarina glauca* open forest (RE 12.1.1) (VM Act – Of concern) and *Eucalyptus saligna* or *E. grandis* tall open forest (RE 12.8.8) (VM Act – Of concern) is present at Schusters Park, Tarrabora Reserve, Beree-Badalla Reserve and Kimmulu Parklands. *Casuarina glauca* open
forest is often subject to groundsel (*Baccharis halimifolia*), ground asparagus (*Asparagus aethiopicus*), mile-a-minute (*Ipomoea cairica*), and umbrella tree (*Schefflera actinophylla*) infestations.

Although not listed under the VM Act as Endangered or Of concern, two additional communities in the planning area are considered significant at the regional scale. *Melaleuca quinquenervia* open forest (RE 12.3.5) currently covers less than 10 percent of the pre-European extent of its range. This community is present at Schusters Park, Merv Craig Recreational Park, Currumbin Waters Park and Eddie Kornhauser Recreational Park.

An important management priority is the preservation (and enhancement where possible) of rare or threatened species populations and their habitats. Significant flora species include those that are protected by State or Federal legislation, or that have populations in the area that are near the limit of the geographic extent of their range, or provide an important habitat resource for significant native fauna. The planning area is known to support a number of threatened plant species including brush cassia (*Cassia marksiana*), small-leaved tamarind (*Diploglottis campbellii*), long-leaved tuckeroo (*Cupaniopsis newmanii*) and rusty rose walnut (*Endiandra hayesi*). The ecological requirements of these and other threatened species are summarised in Table 3 (Section 2.3.1.3). Few baseline surveys have been conducted in the planning area, and at only a few of the reserves (e.g. Elanora Conservation Area). Additional surveys are needed to further characterise the flora values (e.g. status of threatened species populations) that require management attention.

The identification and control of threats to native vegetation and communities is a key management priority across Council’s conservation estate. Threatening processes that influence the condition of vegetation communities in the planning area include fragmentation resulting from clearing for past and present pastoral/agricultural activities and urban development, weed incursion and competition, use of areas for nature-based recreation, inappropriate fire regimes (frequency, season or intensity) and human disturbances. These threatening processes have the ability to degrade ecosystem condition and their impact on the reserves forms the basis of management strategies prescribed by plan.

Historic land management practices including timber getting and clearing for agricultural or development purposes has resulted in fragmentation and severe reductions in the amount of native vegetation in the management cluster. Remaining vegetation is predominantly associated with steep slopes and areas within the floodplains of Tallebudgera and Currumbin creeks that have reduced value for development or agriculture. This remnant vegetation has high natural value either as unique vegetation types in the current urban landscape or as habitat for plant and animal species (both common and threatened) that inhabit the area.

Bell miner (*Manorina melanophrys*) associated dieback (BMAD) is a significant threat to the condition of remnant wet and dry sclerophyll forests of north-east New South Wales and south-east Queensland (Wardell-Johnson et al. 2006, DEC - NSW 2008). BMAD occurs where the sustained presence of bell miners (an aggressive colonial songbird) creates negative feed-back mechanisms (due to bell miner displacement of other insectivorous birds) that maintain elevated and damaging populations of psyllids (small sap sucking insects) in the eucalypt canopy (Stone 1999). The causal factors of BMAD remain unclear but may be linked to natural and man-made disturbance factors. Similar dieback has been reported where noisy miners (*Manorina melanocephala*) are present in high numbers (Lindenmeyer and Burgman 2005).

Fungal soil pathogens, for example *Phytophthora cinnamomi*, are widespread throughout humid areas of New South Wales and Queensland (Wardell-Johnson et al. 2006) and may occur in healthy forest (Stone *et al.* 1995). Soil movement activities including road building, mining, logging, fire control activities, feral pig activity and bush walking have been implicated in the spread of soil pathogens (Garkaklis *et al.* 2004). Although neither BMAD or
Phytophthora cinnamomi have been documented in the planning area, vulnerable forest communities (e.g. those dominated by Eucalyptus saligna, E. grandis, E. siderophloia and E. acemoides) are present and processes that may facilitate the spread of these threats are evident in the area.

At the time of preparation of this management plan, myrtle rust (Uredo rangelii) had relatively recently been identified in parks in south east Queensland. This is a serious disease affecting members of the Myrtaceae family. This disease has been located in the Tallebudgera and Currumbin valleys affecting Rhodamnia rubescens. All sightings of infected individuals are recorded in the Gold Coast Register of Myrtle Rust Locations. Council management staff receive training in the identification and treatment of myrtle rust. Council has also developed a Procedure for Managing Plants infected with Myrtle Rust to assist in determining what type of treatment is applicable in a range of situations. For example, in some instances pruning and disposal of infected sections of plants may be appropriate (provided proper hygiene procedures are followed) and, in other instances, fungicide application may be appropriate. Where infected plants are close to sensitive waterways, fungicide treatment is not always possible due to the highly toxic nature of the fungicides and the impacts these have on amphibians and the waterway. Council will continue to utilise the Procedure for Managing Plants infected with Myrtle Rust to determine the appropriate treatment for each situation. The incidence of myrtle rust across the cluster will also continue to be recorded and monitored over time using Council’s Gold Coast Register of Myrtle Rust Locations as a primary reference.

Suitably vegetated ecological corridors are important for providing safer dispersal opportunities for both flora and fauna species, which can contribute to the genetic diversity and viability of populations. This is particularly important for species that occur in the Elanora-Palm Beach reserves, given the fragmented urban setting of the area. Preventing the loss of vegetation in identified corridors, and enhancing existing corridors, is considered a management priority for these reserves.

Restoration of vegetation structural complexity and floristic diversity and the control of key weed species is undertaken at Council’s reserves to improve ecosystem, habitat condition and enhance links between reserves and other vegetated areas. Restoration is occurring in (and planned for) a number of the Elanora-Palm Beach reserves (see Section 4.6 and Actions 6.1-6.5).

4.3.2 Desired outcomes

- Structural and biological diversity and integrity of remnant vegetation communities, and populations and the diversity of rare, threatened or otherwise significant plant species are protected and enhanced.
- Wildlife corridors and habitat connectivity are maintained and where possible improved.
- Increased understanding of indigenous native flora populations and population viability within the planning area.

4.3.3 Management strategy

4.3.3.1 Guidelines

G3.1 Prioritise management of Endangered and Of concern REs.

G3.2 Enhance and maintain areas known to provide habitat for threatened and/or locally significant native plant species, or some other significant ecological function.

G3.3 Ensure that management operations, such as slashing, controlled burns, weed control, pest animal control, and maintenance of built infrastructure, do not impact on significant plant
species or communities. Where potential damage or incursion is likely, ensure that exclusion zones are created (signed appropriately to ensure visitor safety) and/or suitable barriers are installed.

G3.4 Minimise human and stock access in sensitive areas, including those containing known populations of rare and threatened flora species, riparian areas, and restoration sites. Where required, management measures such as information signage, closure of informal and unnecessary tracks, buffer planting and exclusion zones should be implemented to deter inappropriate access.

G3.5 Where essential works necessitate the clearing of remnant vegetation or marine plant habitat, approval for these works must be sought under the Queensland Vegetation Management Act, Nature Conservation Act or Fisheries Act and the Gold Coast Planning Scheme.

G3.6 Essential removal/translocation and seed collection of rare or threatened plant species must be subject to assessment and approval under the EPBC Act and the NC Act, with relevant permits obtained where necessary.

G3.7 Ensure that all activities in relation to the management of threatened plant species are consistent with the Recovery Planning Process identified by relevant State or Commonwealth government agencies, and that management is in accordance with the management intent of their listing under the NC Act and the EPBC Act.

G3.8 Forward the results of all new floristic studies and incidental flora records to Council’s environmental planning officers to be updated to the Gold Coast City Nature Conservation Strategy Database.

G3.9 All seed collection activities are to be guided by Council’s seed collection policy (currently under development) and managed by Council’s natural areas restorations officers.

G3.10 Reduce the threat of long-term forest dieback through minimising disturbance and maintaining ecosystem function and health in remnant communities. Where forest decline is observed, identify the causative factor/s if possible and investigate opportunities to control decline through current best practice guidelines.

G3.11 Record all new incidences of myrtle rust (Uredo rangelii) in Council’s Gold Coast Register of Myrtle Rust Locations, ensuring that Council fulfils all legal obligations for monitoring and reporting on this disease. Council will treat infestations in accordance with its Procedure for Managing Plants infected with Myrtle Rust and will monitor untreated infestations on an ongoing basis.

G3.12 Where disturbances to native vegetation (e.g. through illegal clearing, uncontrolled access, encroachment, or garden waste dumping) are identified, implement appropriate management measures to control these activities, where necessary with the assistance of Council’s Local Law Unit.

G3.13 Natural areas operations officers to liaise with Council and external infrastructure providers (e.g. Powerlink and Energex) to ensure that future proposed projects and ongoing vegetation management (e.g. within power easements) results in minimal impacts on natural vegetation in and adjacent to the reserves. Require that suitable vegetation clearing offsets are provided in accordance with State and Council legislation and priorities.

4.3.3.2 Actions
A3.1 Conservation officers to conduct baseline flora surveys of key reserves (such as Schusters Park peninsula, Tarrabora Reserve, Beree-Badalla Reserve, Currumbin Waters Park, Simpsons Road Reserve). Surveys should target areas that are representative of the variety of vegetation communities, habitats and landforms that occur across planning area.

A3.2 Natural Areas officers to note (during routine field work) possible maintenance requirements where native vegetation in the reserves is encroaching on neighbouring properties.

4.3.4 Key monitoring priorities

- Monitor presence/absence and population changes at known locations of rare, threatened and/or locally significant species within the planning area.
- Monitor disturbances to native vegetation (e.g. through encroachment, dumping, illegal clearing etc), and the impact of management strategies in remediation and prevention of these.
- Monitor key areas for changes in ecosystem condition and consider the results of this monitoring when undertaking future restoration planning for the reserves.

4.4 Native fauna

4.4.1 Current management situation

Despite severe habitat loss and fragmentation in the adjoining landscape, the Elanora-Palm Beach conservation reserves contain a number of different vegetation communities that provide habitat for diverse assemblages of native fauna.

The long-term viability of native fauna populations is reliant on the continued protection of essential habitats that these species rely on for survival. Threats associated with past habitat loss, fragmentation and ongoing human related disturbance continue to impact on fauna habitats in the reserves. These threats include habitat degradation due to edge effects including: changes in physical environmental conditions (e.g. increased sunlight, temperature, reduced humidity in rainforest areas), increased wind disturbance, reduced canopy cover and height, faster recruitment and increased densities of disturbance adapted species (including weeds and generalist fauna species), altered vegetation community composition and structure and increased tree mortality.

Severe reductions in habitat area and connectivity (such has occurred in the management cluster) generally result in striking detrimental impacts on biodiversity and the viability of native flora and fauna populations. Habitat loss has large, consistently negative effects on biodiversity (Fahrig 2003). One of the most robust and commonly accepted principles of ecology is that as habitat area (and diversity of habitats) increases the number of species present in the area also increases. As such a basic principle of conservation biology is that larger habitat areas should be conserved due to their ability to support a higher number of species (including species that require larger habitat areas). It is noted however that the preservation of smaller areas of habitats that are poorly represented in the landscape, or that comprise important ecological corridors, is also critical.

The “breaking up” or fragmentation of habitats, in combination with habitat loss, may also have negative impacts on biodiversity and the population dynamics of native species. Less mobile species, species with long generation times, and habitat specialists (i.e. those less capable of utilising cleared or disturbed areas) are often more affected by habitat fragmentation. These species have a higher likelihood of experiencing local extinctions due to factors such as reduced migration and dispersal of individuals, decreased genetic diversity (and health), restricted movement between habitat patches (which may limit ability to adapt
to degraded food or breeding resources) and decreased recruitment rates, i.e. fewer individuals surviving to breeding age.

The management cluster supports a regionally significant koala population. As such, koalas are a key fauna management issue for a number of the Elanora-Palm Beach conservation reserves. Koalas have been observed at most reserves vegetated with eucalyptus woodland; even small reserves such as Wyara Court and Calcuta Avenue Reserve are known to support resident and dispersing koalas. The species has experienced dramatic declines (estimated 50 to 90 percent reduction of individuals) across the species range since European settlement (EPA 2006a). Due to these documented reductions, populations inhabiting South East Queensland are listed as vulnerable under the NC Act (DERM 2010a). The greatest threats to the species’ survival are habitat loss and fragmentation, vehicle strikes, dog attacks and disease (e.g. Chlamydia infection) (EPA 2006a). High levels of mortality associated with dispersing koalas in urban environments may severely effect populations in urbanised parts of the region, ultimately impacting on their future survival (Dique et al. 2003).

Reserves such as Simpsons Road Reserve and Elanora Conservation Area are located at the eastern limit of the Currumbin Corridor. In this area, the functionally of the corridor relies on the capacity of woodland patches fragmented by residential development and road infrastructure to provide connectivity to larger tracts of vegetation west of Tallebudgera Connection Road. Simpsons Road and Tallebudgera Connection Road also serve as direct threats to fauna populations in the area. For example, a number of koalas and wallabies have been struck (and in most cases killed) by vehicles on these roads. Vehicle strikes have been confirmed as a significant threat to koalas while dispersing from natural areas to adult breeding home range areas. Eighty percent of deaths documented during a study of koala movements (Dique et al. 2003) were associated with either vehicle strikes or domestic dog attacks. Recently, concerns raised over koala mortality have prompted The Queensland Department of Transport and Main Roads (DTMR) to install signage and other traffic calming measures on Tallebudgera Connection Road.

Chlamydia (a genus of bacteria) infections causing ocular and urogenital disease are an additional threat that can have severe impacts on koala populations. *Chlamydia* infections result in a number of secondary health problems including infertility, rhinitis (stuffy nose), pneumonia, urinary cystitis (urinary tract infection), nephritis (inflammation of kidneys), cystic ovary, conjunctivitis (inflammation of the conjunctiva). Individuals exhibiting these secondary conditions often exhibit reduced health such as malnutrition.

Koalas successfully use highly fragmented habitats in rural settings that have only small remnants of the original vegetation (Gordon 1989; Gordon et al. 1990; White 1999). They also use young forest and highly modified vegetation such as grazed, disturbed or thinned forest and regrowth areas, moving significant distances across the ground between preferred trees (DERM 2006). As such although the planning area has reduced habitat value (due to prevalence of smaller, fragmented habitat patches) management actions aimed at improving habitat suitability and reducing key threats in the area are justified. The implementation of these actions will also benefit other fauna species that inhabit the dry eucalypt forests of the area.

Key management strategies for conserving koala populations in the planning area include:

- increasing densities of preferred koala habitat food trees both in the reserves and on private land in the area
- reducing speed limits along Simpsons Road and improving vehicle driver awareness regarding koala road crossings at Simpsons Road and Tallebudgera Creek Road
- conducting frequent low intensity prescribed burns of dry eucalypt woodlands
- encouraging resident involvement in voluntary programs that contribute to koala conservation (e.g. Land for Wildlife and Voluntary Conservation Agreements)
Council's environmental planning and conservation officers are developing a Koala Conservation Plan for Elanora-Currumbin Waters, which is expected to be finalised in 2013. This plan will identify specific management strategies for koala conservation in the area and will seek to engage the local community in koala conservation efforts, including investigations for a potential ‘backyard koala stewardship’ program.

The protection and continued viability of native fauna in the area will rely on a combination of management measures aimed at protecting significant or key habitats that support them. In addition to action items outlined below, the consolidation of conservation corridors (Section 4.1 – Landscape protection), restoration of disturbed and degraded areas and control of pest plants (Section 4.6 – Pest plants and ecological restoration), control of pest animals (Section 4.7 – Pest animals) and implementation of appropriate fire regimes (Section 4.5 – Bushfire) are critical for preserving viable fauna populations. It is expected that relatively undisturbed habitat areas in the reserves play a crucial role in the survival of a number of local species that have been directly affected by land clearing and urban development in the region. Hence, one of the primary aims of management must be to maximise the available area, quality and connectivity of habitats in the management cluster.

**4.4.2 Desired outcomes**

- Current levels of indigenous fauna species diversity are maintained and viable populations of native species are protected within the planning area.
- Adequate habitat condition and is maintained for viable populations of rare, threatened or otherwise significant fauna.
- Increased understanding of indigenous native fauna populations and population viability within the planning area.

**4.4.3 Management strategy**

*4.4.3.1 Guidelines*

**G4.1** The protection and enhancement of essential habitats for viable populations of native fauna will be a priority in the management approach for the planning area. The management approach will seek to maximise the available area, quality and connectivity of fauna habitats in the planning area.

**G4.2** Undertake all management operations in such a way as to minimise disturbance to native fauna and their habitats. Avoid rapid, broad-scale control of weed infestations to ensure that abrupt declines in fauna habitat availability do not adversely affect local fauna populations.

**G4.3** Ensure that all activities in relation to the management of threatened fauna species are consistent with the Recovery Planning Process identified by relevant State and Commonwealth government agencies, and that management is in accordance with the management intent of their listing under the NC Act and the EPBC Act.

**G4.4** Essential removal or translocation of rare or threatened fauna species must be subject to consultation with Natural Areas officers (to ensure areas are properly prepared prior to translocation), and approval under the EPBC Act and NC Act, and relevant permits must be obtained where necessary.

**G4.5** Encourage the retention of hollow-bearing trees and provision of important habitat for species in appropriate locations on private properties; for example, planting of Richmond birdwing butterfly vine (*Pararistolochia praevenosa* – not the invasive *Aristolochia elegans*). 

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G4.6 Forward the results of all new fauna studies and incidental records to Council’s environmental planning officers to be updated to the Gold Coast City Nature Conservation Strategy Database.

G4.7 Where possible, work with other land managers to facilitate a coordinated approach to fauna management.

G4.8 Where incidents of infectious fauna diseases such as amphibian Chytridiomycosis, Koala Chlamydiosis and Cryptococcosis, and other diseases spread by pest animals are recorded within the planning area, assess the level of risk to the fauna of the planning area and where appropriate, undertake measures based on current best practice guidelines to control their spread.

4.4.3.2 Actions

A4.1 Conduct baseline fauna surveys of key reserves (e.g. Schusters Park, Simpsons Road Reserve, Merv Craig Recreational Park, Tarrabora Reserve, Currumbin Waters Park). Surveys should target areas that are representative of the variety of habitats and landforms that occur across planning area.

A4.2 Support and assist in implementation of koala management strategies recommended in the Koala Conservation Plan for Elanora-Currumbin Waters.

A4.3 Actively seek for Council to implement traffic calming measures (e.g. koala road crossing signs, reduced speed limits to 50 kph) for Simpsons Road south of Guineas Creek Road and Tallebudgera Connection Road.

A4.4 Implement management measures (e.g. closure of informal and unnecessary tracks, planted buffers and signage) to deter inappropriate access to areas containing known populations of rare and threatened species.

A4.5 Provide advice to Wildcare Australia for their establishment of a koala food tree plantation.

4.4.4 Key monitoring priorities

- Regular fauna surveys (every 3-5 years) at key reserves to monitor species richness and indicator species abundance and distribution. Where surveys indicate a loss in species relative to baseline surveys, more intensive monitoring may be required to confirm and identify likely causes of species decline and to direct future management.
- Record and monitor visitor-related disturbance incidents, including infringements of dog restrictions, to identify high risk periods and locations to help direct future management effort.
- Targeted surveys for rare and threatened species to identify key habitat and estimate population size and viability.

4.5 Bushfire

4.5.1 Current management situation

Fire is an important natural phenomenon recognised as one of a number of factors determining the composition of vegetation and animal communities in Australia. Many species of Australian plants and animals have developed mechanisms or behaviour as a response to fire, and some require fire for reproduction or stimulation of new growth.
For many vegetation communities in the planning area, fire is a useful tool for the conservation and enhancement of biodiversity. Integrated approaches utilising ecological restoration and planned burns are effective for improving the condition of fire-adapted ecosystems. Attaining suitable conditions for burns of appropriate intensity often requires careful site preparation using restoration techniques (e.g. weed control). Additional restoration work following planned burns allows for the effective control of may weed species that are either capable of re-sprouting following fire or readily colonise burned areas.

Many flora and fauna species are dependent on fire for their survival, and as such, fire may be introduced in some communities at an appropriate frequency and intensity to promote biodiversity and encourage regeneration. However, riparian rainforest (RE 12.3.1) and wetland areas (RE 12.3.5) are particularly sensitive to fire and, where possible, a nil fire regime will be assigned to these communities in the Bushfire Management Plan for the planning area.

Detrimental impacts of altered fire regimes may include reduced biodiversity and ecosystem condition, altered flora and fauna community structures, increased densities of invasive species (e.g. lantana), reduced habitat quality (e.g. less hollow-bearing trees, leaf litter, fallen logs) and altered microclimate conditions (e.g. increased soil and air temperature, reduced shade and humidity).

The most up-to-date, best practice fire regimes for the regional ecosystems in the planning area are presented in the Regional Ecosystem Description Database (Queensland Herbarium, 2012). Prescribed burns generally should not occur below the lower frequency limit, with programs aiming to vary the inter-fire range within the limits for each regional ecosystem. Maximising this variability will allow for a mixed-aged forest, increase the mosaic patterns, and create different microclimates within the one forest type, serving to increase habitat and species diversity. As these regimes are those which generally apply to each regional ecosystem, they should only be used as a guide. Ultimately, decision making on the frequency of fires is a result of a number of factors including fuel load, proximity to properties, patch size, the recommended fire interval for the regional ecosystem, and other site specific information. This information is articulated in the Elanora Conservation Reserves Bushfire Management Plan (AECOM 2009 – see below).

Areas of wet sclerophyll vegetation (RE12.11.2 - eucalypt dominated canopy with a rainforest understorey) may require fires at long intervals to maintain their community structure. However, implementing planned burns such as these may be difficult in areas with a higher residential risk (due to risk for fire spreading to private properties) or in areas that have poor accessibility.

Gully vine forest (RE 12.11.1) is present in a number of drainages in the south-central section of the management cluster. This vegetation type is particularly sensitive to fires that may spread from dry sclerophyll woodland on adjacent slopes. Mesic vegetation (e.g. RE 12.11.1 and other moist vegetation types) present in gullies of the planning area are known to support rare and threatened flora species including black walnut (*Endiandra globosa*), silver leaf (*Argophyllum nullumense*), long-leaved tuckeroo (*Cupaniopsis newmanii*) and smooth scrub turpentine (*Rhodamina maideniana*). Given the sensitivity of this vegetation to fire and it’s relatively low frequency of occurrence in the landscape, prescribed burns are not planned for gully vine forest areas.

Palustrine wetlands (open forest of *Melaleuca quinquenervia*, *Casuarina glauca* and *Eucalyptus tereticornis* - RE 12.3.5a) are adapted to low intensity fire, but too frequent fire or high intensity fires are likely to result in decline in species composition and soil nutrients. Fire management of these areas will generally consist of incidental low intensity mosaic burning as part of managing other REs in the adjacent landscape.
Dry sclerophyll open forest (e.g. REs 12.11.3, 12.11.5, 12.11.23) requires frequent low to moderate intensity burns to maintain community composition (i.e. natural mixture of species, structure (e.g. good balance of various age-classes for individuals) and ground cover of native grass species such as kangaroo grass (*Themeda triandra*)).

A number of fauna species of conservation significance require lower intensity fires to maintain their habitat, or minimise mortality including the wallum froglet (*Crinia tinnula*), death adder (*Acanthophis antarcticus*), and koala (*Phascolarctos cinereus*). Areas where these or other fire sensitive species are recorded will require fire planning that maximises the protection of relevant species' habitats. Although it is not recommended that fire regimes be determined based on the ecological needs of a single species, where practical, the intervals and intensities preferred or required by significant or priority species should be factored into fire planning. The *Elanora Conservation Reserves Bushfire Management Plan* (AECOM, 2009) identifies known locations of threatened fauna species. Where these species are present, mosaic burning strategies are particularly important.

As an arboreal and slow moving animal that does not use hollows (where it can shelter), koalas are particularly vulnerable to the impacts of hot wildfires that burn the tree canopy (Lindenmeyer and Burgman 2005). This threat to koalas was recognised by ecologists early in the twentieth century (Martin and Handasyde 1999). Frequent low intensity burning of ground and understorey layers of dry eucalypt forests reduces fuel load amounts, and the threat of high intensity burns that can cause local koala extinctions (Lindenmeyer and Burgman 2005). As such, the recommended prescribed burn period for dry sclerophyll forest (e.g. RE 12.11.5a,k, refer to Queensland Herbarium, 2012) needs to be adjusted to account for potential impacts of intense fire on koala populations. A fire interval of six to eight years is therefore recommended for dry sclerophyll forests in the planning area.

The loss of hollow-bearing trees is a recognised threatening process for native Australian fauna (e.g. listed as threatening process in NSW *Threatened Species Conservation Act* 1995). Clearing of vegetation for urban expansion and other development, including the creation of asset protection zones against wildfire, contributes significantly to the ongoing loss of hollow-bearing trees (DEC-NSW 2010b). Hollow formation can be enhanced through damage caused by fire (Adkins 2005). However, intense fires or low frequency burns can lead to a short to medium term shortage of tree hollows (Gibbons and Lindenmayer 1997). The recommendation for a six to eight year fire interval for dry sclerophyll forest will reduce the risk for loss of hollow-bearing trees due to intense fire.

A controlled burn was conducted at Elanora Conservation Area on 16 June 2010 to reduce fuel amounts and fire hazard. The 2010 controlled burn resulted in a good mosaic burn. Understorey areas were burnt effectively and flame heights were kept at desirable levels. The controlled burn contributed to further reductions in molasses grass (a species that presents substantial fire risk) densities that had been previously achieved by three years of active restoration works. Eucalyptus woodland in the area is now exhibiting good condition due to recent restoration and controlled burning efforts. Most of the area now supports healthy densities of native grasses (e.g. kangaroo grass). Areas vegetated with dry eucalyptus woodland in the south-central portion of the management cluster are rated as having moderate to high bushfire risk. Sections of Simpsons Road Reserve, Elanora Conservation Area, Eddie Kornhauser Recreational Reserve, Kimmulu Parklands, Bronhill Reserve, Barlee Court Reserve, Wyara Park, and Simpsons Road Conservation Area exhibit varying levels of risk for bushfire. Areas of moderate to high bushfire risk may require prescribed burns at intervals in the lower end of the recommended spectrum (refer to Queensland Herbarium, 2012) to minimise fuel load levels and the risk for high intensity fires that could impact on adjacent (e.g. residential) areas.

Due to the steep topographic character of areas that exhibit moderate to high bushfire risk, management trails (vehicle trails used for fire response and other management activities) in
these areas have only been established at Elanora Conservation Area and Eddie Kornhauser Recreational Reserve. No other fire fighting infrastructure (e.g. watering points, water tanks) is present in the planning area. The current Bushfire Management Plan for Elanora does not propose further fire fighting infrastructure in Elanora Conservation Area due to the ease of access to a multitude of fire hydrants for the adjacent properties.

The management cluster has experience minimal unplanned burning in recent years. About 2 hectares of paddocks adjacent to the western section of Schusters Park burned in March 2003. Children playing with matches started a fire that burnt approximately 14 hectares of disturbed vegetation (on 11 September 2002), including portions of Barlee Court Reserve and Wyara Park.

A Bushfire Management Plan has been developed for the planning area by Council. This plan is a strategic document that identifies the area’s property and infrastructure assets, natural features and values, and provides direction for the management of fire in the landscape. It aims to achieve both long-term conservation of native plant and animal communities and ongoing protection of life and property within and adjacent to the planning area.

The Elanora Conservation Reserves Bushfire Management Plan (AECOM, 2009) divided the planning area into five zone types for the purposes of bushfire management planning: protection zones, wildfire mitigation zones, vegetation management zones, conservation zones and rehabilitation zones. These zones can be broadly divided into two categories, those primarily designed to protect life and property and those that protect life and property while maintaining and/or enhancing the natural values of the area.

Protection zones and wildfire mitigation zones protect life and property from a serious potential threat of bushfire. Protection zones are designed to be intensely managed areas that provide fuel reduction around assets (e.g. public residences and other structures) adjacent to areas of bushfire hazard (AECOM 2009). These zones have been designated at Simpsons Road Reserve, Elanora Conservation Area, Eddie Kornhauser Recreational Reserve, Buckingham Way Reserve, Forest Drive Reserve, Calcita Avenue Reserve, Kimmulu Parklands, Bronhill Reserve, Simpson Road Reserve, Simpsons Road Conservation Area, Raleigh Terrace Reserve, Casey Park, Wyara Park, Currumbin Waters Park, Beree-Badalla Reserve, Tarrabora Reserve and Schusters Park.

Conservation zones are areas managed to provide the optimum fire regimes needed to maintain the natural biodiversity of relevant vegetation communities. Conservation zones are designated at Buckingham Way, Forest Drive Reserve, Calcita Avenue Reserve, Kimmulu Parklands, Bronhill Reserve, Simpson Road Reserve, Simpsons Road Conservation Area, Raleigh Terrace Reserve, Casey Park, Wyara Park, Currumbin Waters Park, Beree-Badalla Reserve, Tarrabora Reserve and Schusters Park.

Rehabilitation Zones are used to manage threatening processes where the fire regimes applied for other zones are not expected to be effective (AECOM 2009). This zone type is designated for areas in Elanora Conservation Reserve, Eddie Kornhauser Recreational Reserve, Schusters Park, Merv Craig Recreational Reserve, Currumbin Waters Park, Riverglen Park and Coastal Meadows Park and Simpsons Road Reserve.

Vegetation Management Zones are applied for Council managed land that is not intended to be managed primarily for conservation but instead requires management for amenity or other open space purposes. Fuel reduction in these areas is considered to be a secondary outcome (AECOM, 2009).

Improvements for emergency response access and the management trail are needed at the Elanora Conservation Area. The installation of a cul-de-sac at the northern terminus of Westminster Road would improve access and manoeuvrability for emergency vehicles.
Upgrade of the management trail, including re-surfacing with natural material and installation of whoa-boys and outlets in the northern section, is needed to improve public and operational access to the area.

Private properties adjacent to the Elanora Conservation Area contain relatively large tracts of eucalypt forest. Fuel load and fire hazard is likely to be high in the majority of these areas. Education and awareness programs are needed to inform residents of the need to maintain their properties for reduced fire hazard.

Council will continue to support the South East Queensland Fire and Biodiversity Consortium in determining fire management requirements for the range of biodiversity within the planning area. In particular, priority fire research projects will be encouraged within the area.

4.5.2 Desired outcomes

- Human life and property in and adjacent to the planning area, including management structures are protected.
- Sites, relics and structures of European and Aboriginal cultural heritage value are protected from radiant heat and fire management activities.
- Maintenance and enhancement of ecosystem health and diversity through best practice ecological fire management.
- Fire management is undertaken in cooperation with neighbours and other relevant organisations.
- Increased community understanding of fire hazards, individual responsibilities and fire ecology.
- Improved understanding of fire management requirements for ecosystems and species occupying the planning area.

4.5.3 Management strategy

4.5.3.1 Guidelines

G5.1 Undertake fire planning and fire management in accordance with the Elanora Conservation Reserves Bushfire Management Plan (AECOM 2009) to protect life and property; enhance species and habitat diversity, and connectivity across the landscape; and encourage recruitment of significant species.

G5.2 Ensure that fire management planning and operations incorporate updated recommendations of the South East Queensland Fire and Biodiversity Consortium and the Queensland Herbarium regarding appropriate fire management prescriptions for each regional ecosystem present within the planning area.

G5.3 Ensure that bushfire management planning for the planning area is consistent with and complimentary to existing QFRS/RFS Local Action Plans and QPWS Fire Management Systems.

G5.4 To maximise opportunities for the protection of fire-sensitive species, ecosystems and habitat features, Council’s natural area management officers and seconded QFRS officers are responsible for all fire planning and implementation, including incident control support, within the planning area.

G5.5 Ensure that thorough ground truthing is carried out at all sites prior to planned burning to identify site constraints, safety issues, and species, habitats, ecological communities and sites of cultural significance requiring specific management.
G5.6 Ensure that areas of known koala habitat (RE 12.11.5 a, k; RE 12.11.13 in Simpsons Road Reserve and Elanora Conservation Area) are managed specifically to reduce the risk of high intensity burns through frequent (e.g. every 6 to 8 years) low to moderate intensity burns or restoration techniques including control of understory weedy vegetation (e.g. lantana).

G5.7 Wildfires will be extinguished as quickly as possible, except under circumstances in which the fire is considered to be of ecological benefit to the site and does not threaten life and property, and Queensland Fire and Rescue Service has been consulted.

G5.8 Where life and property priorities allow, ensure that the timing of planned burns in mitigation and conservation zones (as determined by the strategic Bushfire Management Plan) supports ecological restoration projects.

G5.9 Provide advice to Council’s development assessment officers to ensure that all necessary bushfire hazard reduction measures are incorporated into proximate new developments and do not adversely impact on the planning area.

G5.10 Minimise the potential for increased fire hazard through:
- Prohibition of open fires in the planning area,
- Excluding hazardous management activities (slaughtering, welding, grinding and other construction/demolition activities) during periods of very high-extreme fire danger, 
- Use of appropriate design and materials for all new built infrastructure and embellishments.

G5.11 Where possible, avoid the use of heavy machinery for fire suppression within the planning area, particularly in areas of rare plants, threatened wildlife habitat, and cultural heritage value.

G5.12 Where possible, prioritise and control weed infestations considered to substantially increase fire hazard potential, fire intensity and the site’s capacity to carry fire (e.g. molasses grass (Melinis minutiflora)).

G5.13 Maintain close cooperation with other government agencies, neighbours, traditional owners and the local Urban and Rural Fire Brigades for the management of fire in and adjoining the planning area.

G5.14 Keep the public, particularly neighbours, informed of fire management activities through local media, Council’s website and signage at entry points to the planning area.

G5.15 Continue to support and facilitate partnerships with the South East Queensland Fire and Biodiversity Consortium.

4.5.3.2 Actions

A5.1 Implement the Elanora Conservation Reserves Bushfire Management Plan (AECOM 2009), including establishment of relevant management zones to provide for the protection of life, property and natural and cultural values, maintenance of fire management infrastructure and delivery of hazard reduction burns in accordance with city-wide burn priorities.

A5.2 Review the Elanora Conservation Reserves Bushfire Management Plan every ten years, in consultation with relevant stakeholders. Confine these reviews to amendments associated with:
- pertinent new research findings and information
- the results of monitoring programs, where they indicate the need for changes in management
the need for water tanks in the planning area
existing management strategies that are not achieving stated objectives

A5.3 Develop and maintain GIS mapping layers to inform effective fire planning, including:
- basic topographic attributes
- vegetation communities, including information on age classes
- threatened and significant plant species and communities
- the habitats of rare and threatened native animal species
- fire histories, including ignition sources and fire path information
- fuel load attributes
- management trails and fire breaks
- water points
- built infrastructure and assets

A5.4 Construct a cul-de-sac at the end of Westminster Boulevard. This infrastructure will provide improved emergency services response for the Elanora Conservation Area and adjacent residences and minimise impacts from heavy vehicle turnaround (eg garbage trucks).

A5.5 Facilitate community education to inform priority neighbouring residents of the need to maintain their properties to reduce fire hazard.

A5.6 Provide Incident Management Team support at wildfire events to facilitate the protection of life, property and the environment.

A5.7 Undertake fuel hazard monitoring prior to and following all prescribed burns, and conduct similar monitoring following wildfires where time and resources permit.

4.5.4 Key monitoring priorities
- Monitor environmental weed densities following prescribed burns to assess the need for weed control following burns.
- Monitor vegetation recovery, habitat condition and plant species composition (including weeds) at key sites burnt during planned or accidental fires.
- Monitor incidence of garden waste dumping and accidental/malicious fires on or adjacent to reserves of the planning area to guide further management action.

4.6 Pest plants and ecological restoration

4.6.1 Current management situation

The landscape of the management cluster prior to European settlement was characterised by Banksia woodland along the coastal strip, paperbark open forest in the coast lowland areas, blackbutt woodland on ridgelines and hills and a mixture of other dry and eucalypt woodlands and riparian rainforest areas. Most of these naturally vegetated areas have been highly degraded or fragmented.

Land clearing and fragmentation, altered fire regimes and previous land uses including cattle grazing and dairy farming have increased the occurrence of several non-native species that may be referred to as ‘declared pest plants’ (a legislation related term) or ‘environmental weeds’ (non-native species that are able to invade natural vegetation communities). Some declared plants and environmental weeds are capable of altering the physical structure, environmental conditions and natural functions of ecosystems. These alterations of vegetation community structure often equate to substantial declines in native species
diversity due to impacts on flora and fauna species (through habitat degradation) and communities.

Council has obligations under the Land Protection (Pest and Stock Route Management) Act 2002 (Land Protection Act) to control declared pest plants on the land it manages. Declared (Class 1, 2, 3) plants are targeted (by pest management officers) for control because they have, or could have, serious economic, environmental or social impacts. Senegal tea (Gymnecoronis spilanthoides) is currently the only known Class 1 pest plant occurring within the planning area. It has been identified in an open drain in Eddie Kornhauser Recreational Reserve and is being monitored and managed by Council’s pest management officers.

A number of other Class 1 pest plants occur in close proximity to the planning area reserves. Alligator weed (Alternanthera philoxeroides) is known to occur just outside the planning area at the Currumbin District Horse Club. Aquatic and terrestrial forms of Alligator weed were identified at the site during a routine Council weed control inspection in May 2006. The site has been fenced and control efforts are proceeding under a management plan prepared by Council’s pest management officers. The primary aim of the Alligator weed management plan is to contain and eradicate the species from the site and adjoining lands (GCC 2009c). Vigilance is required throughout the planning area as Alligator weed may be have been spread from this site by the sale/giveaway of horse manure and horse movements prior to the identification of the existing infestation.

Bitou bush (Chrysanthemoides monilifera subsp. rotunda) has previously been removed from Rockview Public Park, which neighbours Tarrabora Reserve, and from foreshore areas east of Tallebudgera Fitness Camp and on the edge of Burleigh Heads National Park. Miconia calvescens has also previously been identified within the planning area. Ongoing vigilance is required regarding these species as there is a risk that they may occur within the planning area reserves.

Non-declared environmental weeds are also considered a management priority due to their potential to infest natural areas in high numbers. Many environmental weeds hinder the survival and regeneration of native plant species, and in some cases, may permanently alter both structure and composition of native vegetation communities. Class 3 declared plants and priority environmental weeds are controlled in a systematic and integrated way to maximize the recovery of affected vegetation and the habitat values provided by these areas.

Vegetation types associated with waterways, drainages and adjacent areas (e.g. REs 12.1.1, 12.3.1 and 12.3.5) of the planning area contain high densities of environmental weeds. Dominant environmental weeds in these areas include camphor laurel (Cinnamomum camphora), broad-leaf pepper tree (Schinus terebinthifolius), Madeira vine (Anredera cordifolia), cats claw creeper (Dolichandra unguis-cati), Dutchman’s pipe (Aristolochia elegans), ground asparagus (Asparagus aethiopicus), lantana (Lantana camara), and Singapore daisy (Sphagneticola trilobata), all of which are declared species (see Table six), plus Easter cassia (Senna pendula var. glabrata), umbrella tree (Schefflera actinophylla), climbing nightshade (Solanum seaphthianum), resurrection plant (Bryophyllum pinnatum), mile-a-minute (Ipomoea cairica), glycine (Neonotonia wightii), Brazilian cherry (Eugenia uniflora), Mickey Mouse plant (Ochna serrulata), blue billy goat weed (Ageratum houstonianum), broad-leaved paspalum (Paspalum wettsteinii), para grass (Urochloa mutica (syn. bracharia)) and South African pigeon grass (Setaria sphacelata).

Woodland and forest areas in the planning area are often degraded by infestations of giant rat’s tail grass (Sporobolus pyramidalis), which is a class 2 declared pest plant, lantana (class 3) and the following environmental weeds: Chinese berr (Triumfetta rhomboidea), cocos palm (Syagrus romanzoffiana), corky passionfruit (Passiflora suberosa), wild tobacco (Solanum mauritianum), edible passionfruit (Passiflora edulis), Easter cassia, giant devil’s fig (Solanum chrysotrichum), climbing nightshade, fishbone fern (Nephrolepis cordifolia),
Crofton weed (*Ageratina adenophora*), orange jessamine (*Murraya paniculata*), mile-a-minute, South African pigeon grass, molasses grass, Rhodes grass (*Chloris gayana*), broad-leaved paspalum and palm setaria (*Setaria palmifolia*).

The Land Protection Act has designated three categories for “declared” pest plants:

Class 1: not broadly established in Queensland, but has potential to become a serious pest; all landholders are required by law to keep their land free of Class 1 pests

Class 2: established in substantial areas of Queensland; all landholders must try to keep their land free of Class 2 pests

Class 3: commonly established in parts of Queensland; a notice may be issued on a landowner to take reasonable action to control an infestation of these weeds if it is causing, or has the potential to cause an adverse impact, on a nearby ‘environmentally significant area’.

Declared plants are managed at the local level through Gold Coast City Council’s *Pest Management Plan* 2006-2010 (GCCC 2008).

The weed species listed in Table 8 are considered to pose a significant threat to the biodiversity or conservation values of the planning area and are therefore considered priority species for control. The list is based on those weeds currently documented as occurring in the planning area. Future weed species observations will need to be compared against the list to determine if additional species must be added. For example, additional declared plants such as annual ragweed (*Ambrosia artemisiifolia*), and Parramatta grass (*Sporobolus fertilis*) may also be present in the planning area.

Council priority (GCCC priority) rankings presented in Table 8 are based on those prescribed in Council’s *Pest Management Plan* (GCCC 2008). These rankings do not necessarily reflect the level of threat that these species may incur on the planning area. As such, the actual control priorities for these species may be higher (particularly for environmental weeds) than those in Table 8 and will be based on the discretion of relevant Council natural areas restoration and pest management officers.

**Table 6. List of declared and priority weeds for control within the Elanora-Palm Beach Planning Area**

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Class¹</th>
<th>Rank²</th>
<th>GCCC priority³</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Ageratina adenophora</em></td>
<td>crofton weed</td>
<td>—</td>
<td>17</td>
<td>—</td>
</tr>
<tr>
<td><em>Ageratina riparia</em></td>
<td>mistflower</td>
<td>—</td>
<td>25</td>
<td>Medium</td>
</tr>
<tr>
<td><em>Anredera cordifolia</em></td>
<td>madeira vine</td>
<td>3</td>
<td>5</td>
<td>High</td>
</tr>
<tr>
<td><em>Araujia senticera</em></td>
<td>moth vine</td>
<td>—</td>
<td>26</td>
<td>—</td>
</tr>
<tr>
<td><em>Aristolochia elegans</em></td>
<td>dutchman's pipe</td>
<td>3</td>
<td>39</td>
<td>Medium</td>
</tr>
<tr>
<td><em>Asparagus aethiopicus</em></td>
<td>ground asparagus</td>
<td>3</td>
<td>23</td>
<td>Medium</td>
</tr>
<tr>
<td><em>Asparagus africanus</em></td>
<td>climbing asparagus</td>
<td>3</td>
<td>6</td>
<td>Medium</td>
</tr>
<tr>
<td><em>Baccharis halimifolia</em></td>
<td>groundsel bush</td>
<td>2</td>
<td>2</td>
<td>High-Medium</td>
</tr>
<tr>
<td><em>Brachiaria mutica</em></td>
<td>para grass</td>
<td>—</td>
<td>42</td>
<td>Low</td>
</tr>
<tr>
<td><em>Bryophyllum delagoense</em></td>
<td>mother of millions</td>
<td>2</td>
<td>27</td>
<td>Low</td>
</tr>
<tr>
<td><em>Callisia fragrans</em></td>
<td>basket plant</td>
<td>—</td>
<td>103</td>
<td>—</td>
</tr>
<tr>
<td><em>Callisia repens</em></td>
<td>inch plant</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td><em>Celtis sinensis</em></td>
<td>chinese celtis</td>
<td>3</td>
<td>7</td>
<td>Medium</td>
</tr>
<tr>
<td><em>Chrysanthemoides monilifera</em></td>
<td>bitou bush</td>
<td>1</td>
<td>12</td>
<td>High</td>
</tr>
<tr>
<td>subsp. <em>rotundata</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Cinnamomum camphora</em></td>
<td>camphor laurel</td>
<td>3</td>
<td>8</td>
<td>Medium</td>
</tr>
<tr>
<td><em>Commelina benghalensis</em></td>
<td>hairy commelina</td>
<td>—</td>
<td>122</td>
<td>—</td>
</tr>
<tr>
<td><em>Corymbia torelliana</em></td>
<td>cadaghi</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td><em>Desmodium intortum</em></td>
<td>green-leaf desmodium</td>
<td>—</td>
<td>183</td>
<td>—</td>
</tr>
<tr>
<td>Scientific Name</td>
<td>Common Name</td>
<td>Class</td>
<td>Rank</td>
<td>GCCC priority</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>------------------------------</td>
<td>-------</td>
<td>------</td>
<td>---------------</td>
</tr>
<tr>
<td>Desmodium uncinatum</td>
<td>silver-leaf desmodium</td>
<td>-</td>
<td>64</td>
<td>-</td>
</tr>
<tr>
<td>Dolichandra unguis-cati</td>
<td>cats claw creeper</td>
<td>3</td>
<td>4</td>
<td>High</td>
</tr>
<tr>
<td>Eugenia uniflora</td>
<td>Brazilian cherry</td>
<td>-</td>
<td>188</td>
<td>-</td>
</tr>
<tr>
<td>Gymnocoronis spilanthoides</td>
<td>Senegal tea</td>
<td>1</td>
<td>35</td>
<td>High</td>
</tr>
<tr>
<td>Ipomoea cairica</td>
<td>mile-a-minute</td>
<td>-</td>
<td>28</td>
<td>-</td>
</tr>
<tr>
<td>Lantana camara</td>
<td>lantana</td>
<td>3</td>
<td>1</td>
<td>Medium</td>
</tr>
<tr>
<td>Ligustrum lucidum</td>
<td>privet (large leaf)</td>
<td>3</td>
<td>15</td>
<td>-</td>
</tr>
<tr>
<td>Dolichandra unguis-cati</td>
<td>cat’s claw creeper</td>
<td>3</td>
<td>4</td>
<td>High</td>
</tr>
<tr>
<td>Macroptilium atropurpureum</td>
<td>siratro</td>
<td>-</td>
<td>51</td>
<td>-</td>
</tr>
<tr>
<td>Macrotyloma uniflorum</td>
<td>horse gram</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Melinis minutiflora</td>
<td>molasses grass</td>
<td>-</td>
<td>38</td>
<td>Low</td>
</tr>
<tr>
<td>Neonotonia wightii</td>
<td>glycine</td>
<td>-</td>
<td>19</td>
<td>High</td>
</tr>
<tr>
<td>Ochna serrulata</td>
<td>mickey mouse plant (ochna)</td>
<td>-</td>
<td>22</td>
<td>Low</td>
</tr>
<tr>
<td>Opuntia stricta</td>
<td>prickly pear</td>
<td>2</td>
<td>111</td>
<td>Low</td>
</tr>
<tr>
<td>Paspalum wattsteinii</td>
<td>broad-leaf paspalum</td>
<td>-</td>
<td>72</td>
<td>-</td>
</tr>
<tr>
<td>Passiflora foetida</td>
<td>stinking passionflower</td>
<td>-</td>
<td>70</td>
<td>-</td>
</tr>
<tr>
<td>Passiflora suberosa</td>
<td>corky passion flower</td>
<td>-</td>
<td>37</td>
<td>-</td>
</tr>
<tr>
<td>Passiflora subpeltata</td>
<td>white passion flower</td>
<td>-</td>
<td>63</td>
<td>-</td>
</tr>
<tr>
<td>Pinus elliottii</td>
<td>slash pine</td>
<td>-</td>
<td>44</td>
<td>Low</td>
</tr>
<tr>
<td>Ricinus communis</td>
<td>castor oil plant</td>
<td>-</td>
<td>81</td>
<td>-</td>
</tr>
<tr>
<td>Rivina humilis</td>
<td>coral berry</td>
<td>-</td>
<td>31</td>
<td>-</td>
</tr>
<tr>
<td>Salvinia molesta</td>
<td>salvinia</td>
<td>-</td>
<td>-</td>
<td>High</td>
</tr>
<tr>
<td>Schefflera actinophylla</td>
<td>umbrella tree</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Schinus terebinthifolius</td>
<td>broad-leaf pepper tree</td>
<td>3</td>
<td>9</td>
<td>High</td>
</tr>
<tr>
<td>Senna pendula var. glabrata</td>
<td>Easter cassia/ winter senna</td>
<td>-</td>
<td>45</td>
<td>Low</td>
</tr>
<tr>
<td>Setaria palmifolia</td>
<td>palm setaria</td>
<td>-</td>
<td>181</td>
<td>-</td>
</tr>
<tr>
<td>Setaria sphacelata</td>
<td>setaria</td>
<td>-</td>
<td>85</td>
<td>-</td>
</tr>
<tr>
<td>Solanum chrysotrichum</td>
<td>giant devils fig</td>
<td>-</td>
<td>135</td>
<td>-</td>
</tr>
<tr>
<td>Sphagnetica triloba</td>
<td>Singapore daisy</td>
<td>3</td>
<td>16</td>
<td>Medium</td>
</tr>
<tr>
<td>Sporobolus pyramidalis</td>
<td>giant rat’s tail grass</td>
<td>2</td>
<td>24</td>
<td>High</td>
</tr>
<tr>
<td>Stenotaphrum secundatum</td>
<td>buffalo grass</td>
<td>-</td>
<td>187</td>
<td>-</td>
</tr>
<tr>
<td>Syagrus romanzoffiana</td>
<td>cocos palm</td>
<td>-</td>
<td>75</td>
<td>-</td>
</tr>
<tr>
<td>Tradescantia fluminensis</td>
<td>trad, wandering jew</td>
<td>-</td>
<td>58</td>
<td>-</td>
</tr>
<tr>
<td>Thunbergia alata</td>
<td>black-eyed susan vine</td>
<td>-</td>
<td>49</td>
<td>Low</td>
</tr>
</tbody>
</table>

2: Queensland Herbarium list of Invasive Naturalised Plants in Southeast Queensland (Bitianoff and Butler 2002).  
3: Gold Coast City Council Pest Management Plan.

Restoration work is currently being conducted in vegetated sections of Schusters Park, Elanora Wetlands Reserve, Tarrabora Reserve, Beree-Badalla Reserve, Merv Craig Recreational Reserve, Eddie Kornhauser Recreational Reserve (Water Gum Street, Melaleuca woodland), Simpsons Road Conservation Area and Elanora Conservation Area. Mown sections of these parks will be retained and managed for active recreation, with restoration restricted to existing stands of remnant or degraded remnant vegetation. For example, Figure 3 shows planned and existing restoration zones in vegetated sections of Schusters Park and Elanora Wetlands.

Most reserves in the management cluster contain areas of vegetation that could benefit from restoration, and ongoing commitment to restoration will help to conserve and improve the condition of existing native vegetation within the planning area, as well as improving scenic amenity for park users. However, available resources (i.e. staff and funding) limit the amount of restoration that can be undertaken at any particular time and restoration priorities must be set in the context of restoration needs across Council’s entire conservation estate. High priority restoration areas are those which satisfy some or all of the following:

- highly intact vegetation communities
- ‘endangered’ and ‘of concern’ regional ecosystems
Vegetation in Forest Drive Reserve, Kimmulu Parklands, Calcita Avenue Reserve, Wyara Park, Currumbin Waters Park (adjacent to walking track), Schusters Park (oxbow and eroded sections of Tallebudgera Creek banks) and Simpsons Road Reserve are priority areas for future restoration works. Council’s natural areas restoration officers will undertake additional assessments of these reserves to clarify restoration priorities for the planning area. The presence of these reserves within the Currumbin Corridor (critical corridor under the NCS) will be considered when determining restoration priorities for these areas.

Figure 3. Current restoration areas (in green) in Schusters Park and Elanora Wetlands

All Council restoration work is governed by Restoration Plans or Action Plans that set goals, describe current conditions for the site, prescribe a program/schedule for works, identify priority zones and appropriate techniques and approaches for their restoration. Assisted regeneration is a preferred restoration method because it maximises positive outcomes at relatively low cost. This approach is appropriate in relatively intact native plant communities where seed bank conditions and limited intervention such as weed control, track closure,
erection of fencing, etc. are sufficient to restore the native vegetation by facilitating natural regeneration and successional processes.

Palm Beach-Currumbin State High School is utilising an area in Beree-Badalla Reserve (adjacent to the upstream boardwalk viewing platform) to accessCurrumbin Creek for kayaking activities. This use has resulted in compaction of marine sediments, and associated impacts on mangrove vegetation, along the informal access path. Council is working with the school to develop a mangrove education and restoration project for the area, which will mitigate the impacts of the school’s use of the area (refer to Section 4.10.1.2).

The Tallebudgera Creek Catchment Management Plan (Australian Wetlands 2006) identified sections of Schusters Park as having “conservation” and “high” value riparian vegetation recovery potential. The plan identified these areas as sites that may justify higher restoration priority. NAMU is currently undertaking restoration works at these sections of Schusters Park.

Revegetation work is to be conducted to establish riparian area and wetland buffers of a width consistent with the Nature Conservation Code which is to be incorporated into Council’s revised (2012) Planning Scheme.

4.6.2 Desired outcomes

- Restore degraded native vegetation communities and minimise impacts associated with pest plants and their control on native flora and fauna, cultural heritage sites, and landscapes within the planning area.
- Maintain high conservation value vegetation that currently exhibits good integrity/condition.
- Reduced threat of future weed invasion and vegetation disturbance.
- Planning for pest plant control and restoration is strategic, coordinated and collaborative.
- Improved public understanding of, and support for, ecological restoration and pest plant management programs within the planning area.

4.6.3 Management strategy

4.6.3.1 Guidelines

G6.1 NAMU will coordinate control programs for declared plants and priority environmental weeds as required to ensure an integrated and controlled program of ecological restoration. Council’s pest management officers will assist NAMU in coordinating management of Class 1 and Class 2 declared plants in the reserves.

G6.2 Ensure that all pest plant priorities, planning and management are integrated and aligned with the intent and objectives of all relevant Commonwealth, State and Council guidelines, strategies, policies and legislation.

G6.3 Where practical and resources permit, Council’s natural areas restoration officers will undertake assessments of the condition and degree of weed infestation within the reserves. New information on Class 1 and 2 declared species will be regularly shared with Council’s pest management officers.

G6.4 Ensure all staff, contractors, and volunteers are trained to recognise threatened or rare species known or suspected to occur in the reserves to ensure that careful weed control methods are undertaken.

G6.5 Where revegetation is required within the planning area, locally sourced naturally occurring species must be utilised.
G6.6 Ensure that restoration activities are carried out with due sensitivity to fauna habitat, including:

- sensitive use of herbicides adjacent to waterway/wetland areas. Herbicides will generally not be permitted to enter natural waterways and artificial water bodies within the planning area, and where necessary (based on herbicide to be used), herbicide-free buffer zones should be established around aquatic systems to minimise risk. However, under circumstances in which it is necessary to apply herbicides within close proximity to water bodies, only low-impact chemicals suitable for use in aquatic environments (e.g. Glyphosate Bioactive or equivalent) should be employed
- no rapid or substantial loss of fauna habitat associated with restoration works. Rehabilitation of weedy areas known to provide fauna habitat is to be staged to ensure no complete temporary loss of food resources or cover for ground dwelling species
- inclusion of preferred koala food trees in restoration plans prepared for reserves containing or adjacent to known koala habitat.

G6.7 Consider erosion-prone areas and areas of creek bank instability identified in catchment management plans during restoration prioritisation and planning and ensure that restoration activities adjacent to waterways are staged to achieve a gradual transition from exotic to native plant species, preventing exposure and accelerated erosion of stream banks.

G6.8 Consultation and collaboration between Council’s natural areas restoration officers and relevant fire officers should be undertaken to maximise opportunities for ecological restoration in association with prescribed burn programs.

G6.9 Until an Ecological Restoration Plan, Action Plan or Contractor Specifications has been developed for a reserve, pest plant control for that reserve should be limited to essential works only (i.e. follow up control, removal of declared species, high-threat environmental weeds, infestations located in high visitation areas, and species considered to be a fire hazard or significant threat to the ecology of the site).

G6.10 All Restoration Plans for the planning area should include:

- Map identifying work zones, site features (waterways, access etcetera)
- Defined order of works and level of follow up required.
- Appropriate techniques for restoration and follow up.
- Flora species list and appropriate native planting list where revegetation is required.
- Monitoring and reporting protocols including performance criteria to assess effectiveness of restoration programs
- Opportunities for coordinating restoration works with neighbouring landholders

G6.11 Landholders should be discouraged from carrying out weed removal or revegetation works in conservation reserves where these works do not form part of a Council-coordinated restoration strategy.

G6.12 Continue to maintain photographic records and collate data regarding restoration works carried out in the reserves including areas treated, weeds controlled, herbicides used, total number of hours worked per site and targets for future works.

4.6.3.2 Actions

A6.1 Continue with current ecological restoration works at Schusters Park, Tarrabora Reserve, Beree-Badalla Reserve, Merv Craig Recreational Park, Eddie Kornhauser Recreational Reserve, Simpsons Road Conservation Area and Elanora Conservation Area
ensuring that adequate resources are provided for follow-up management. Routine maintenance should be conducted in association with all restoration activities undertaken within the planning area.

A6.2 Forest Drive Reserve, Kimmulu Parklands, Calcita Avenue Reserve, Wyara Park, Currumbin Waters Park, Schusters Park (oxbow lake and areas adjacent to upstream section of Tallebudgera Creek) and Simpsons Road Reserve have been identified as possible high priority restoration sites. Undertake further assessment of restoration priorities for these and other sites with consideration of the following (and other) factors:

- these reserves are in theCurrumbin Corridor (critical corridor under the NCS)
- type and extents of weed infestations in the reserves
- availability of access to affected areas
- resilience of affected vegetation
- topography of areas
- restoration priorities identified in Catchment Management Plans, including unstable creek banks and riparian corridors.

A6.3 Prepare Restoration Plans/Action Plans for high priority reserves (as identified by Action A6.2 above). These plans will determine operational requirements and priorities for restoration and weed management activities with the primary aim of restoring degraded areas and enhancing ecological values.

A6.4 Establish a mangrove education and restoration project to reduce the impacts of Palm Beach-Currumbin State High School on Beree Badalla Reserve. Beree Badalla Reserve is in the Currumbin Creek Fish Habitat Area (FHA), hence restoration will need to comply with sections 6.2.1 Restoring the fish habitat or natural processes and/or 6.2.2 Managing fisheries resources or fish habitat of Fisheries Queensland policy Management of declared Fish Habitat Areas FHIMOP 002. The project restoration action plan will need to be endorsed by DAFF prior to initiation of works.

A6.5 Council’s natural areas management officers to conduct monitoring for declared plants and high priority environmental weeds at reserves where existing infestations are present, or there is a high risk for new infestations to occur.

A6.6 Regularly update the Natural Areas Restoration Database with weed species observed and treated during site restoration, area covered, methodology and hours worked.

A6.7 Incorporate field observations of declared pest plants into the NAMU incidental records database, the GCCC flora and fauna records database and notify Council’s pest management officers of new infestations of Class 1 and 2 declared plants (within 24 hours and 7 days respectively) to enable better integration of control and monitoring activities.

A6.8 Following prescribed burns, and where possible wildfires, assess the re-colonisation of weeds and carry out follow-up weed control.

A6.9 Participate in the development and implementation of coordinated regional pest plant control initiatives with neighbours, community groups, and other land management agencies, including Biosecurity Queensland. Where feasible, pursue partnerships with DNPRSR, the Department of Agriculture, Fisheries and Forestry (DAFF) and other local councils to facilitate collaborative pest plant management between Council and State managed reserves, particularly where pest plant species from State managed sites occur upslope/upstream of sites recently restored by Council.

A6.10 Where additional resourcing is required to undertake restoration within natural area developer-contributed public open space, investigate the feasibility of Council’s natural areas restoration teams conducting works in these areas.
A6.11 Continue working with and supporting the Bushcare groups that work in the management area.

4.6.4 Key monitoring priorities

- Monitor restoration sites to assess the success of ecological restoration programs (e.g. in enhancing native vegetation structure, diversity, integrity and habitat use and condition). Riparian and In-stream Rapid Assessments can be used to monitor waterway condition at riparian restoration sites.
- Council restoration teams and restoration contractors to monitor restoration sites to identify new occurrences of pest plant species or expansions of existing infestations within the planning area.
- Monitor reserve boundaries during ranger patrols to identify and regulate new instances of green waste dumping or vegetation disturbance.

4.7 Pest animals

4.7.1 Current management situation

Pest animals are those species not native to the planning area. They generally have a detrimental impact on natural areas through predation, displacement or competition with native animals.

The following key threatening processes listed under the Commonwealth EPBC Act are related to pest species known to occur in the planning area:

- biological effects, including lethal toxic ingestion, of cane toads (Rhinella marina)
- predation by European red fox (Vulpes vulpes)
- predation by feral cats (Felis catus)
- competition and land degradation by rabbits (Oryctolagus cuniculus)

Other notable threatening processes associated with invasive species that are expected to impact on natural values of the planning area include predation by feral dog (Canis familiaris), and competition for nesting and foraging habitat with the common myna (Acridotheres tristis).

Lethal toxic ingestion by frog-eating predators is the major single mechanism for impacts associated with cane toads. Populations of large predators (e.g. monitor lizards, elapid snakes and dasyurid marsupials) can be imperilled following the initial invasion of cane toads. Because cane toads eat a wide variety of prey, have greater reproductive potential capacity than native frogs and develop rapidly in tropical and sub-tropical regions, colonizing toads attain very high densities (Freeland 1986). They tolerate a broad range of environmental and climatic conditions and occupy a wide range of habitats (Urban et al. 2007), though with a clear preference for human-degraded sites (Zug and Zug 1979).

The European red fox was deliberately introduced to Australia in the mid to late 1800’s. It occurs in a wide range of habitats, including urban areas. Foxes have been observed throughout the planning area and park neighbours have expressed concern about their impact on ground-nesting birds. Predation pressure from single individuals can result in severe declines in susceptible fauna populations, e.g. those of colonial ground-nesting birds and small to medium sized ground-dwelling mammals, (Reddiex and Forsyth 2004). Council's Animal Control Unit undertakes fox control activities in the planning area, in response to incidental reports. However, foxes continue to present control challenges due to their ability to adapt and succeed in both altered and semi-natural landscapes. While animal baiting is impractical in urban settings (due to risk for domestic animal deaths), humane trapping and euthanasia by carbon dioxide are currently used to manage foxes in reserves.
However, once removed from a site foxes are able to rapidly recolonise from adjacent areas, such as the Currumbin and Tallebudgera valleys.

Feral and domestic cats are likely to have significant negative impacts on native fauna of the planning area. Cats have been found to prey on over 345 different native animal species (DERM 2010b). Where rabbits are abundant, they generally comprise the largest proportion of feral cat diets (Molsher 1999). In urban environments where rabbit densities are likely to be relatively lower than those of rural populations, native fauna are likely to be at greater risk for predation by cats. Queensland’s feral cat population stands at about 1.5 million, which is greater than the domestic cat population. But even domestic cats kill and injure wildlife in surprising numbers (DERM 2010b). Feral cats present considerable challenges for control programs due to generally low trapping success and a lack of reliable methods for estimating cat abundance for measuring the effectiveness of control efforts (Reddiex and Forsyth 2004). Although feral dogs are likely to be present in the planning area, this predator is probably present in higher densities in rural areas west of Tallebudgera Connection Road. As such Council focuses control efforts for feral dogs in areas to the west of the planning area. Unrestrained domestic dogs also present significant threats to fauna species and can threaten populations of wallabies and koalas.

In their native range, common (Indian) mynas evolved in open woodland habitats (Pell and Tidemann 1997). Outside their native range, common mynas have naturalised in a variety of habitat types, but generally in open areas, where natural tree cover has been damaged or removed. Where favourable habitat is present, common mynas can incur a range of ecological and commercial impacts including: reducing breeding success of native species (e.g. birds, mammals, reptiles) that nest in tree hollows, direct mortality of small species or juveniles, spreading diseases to other native birds, damage to crops and spread of weed species including lantana (DPI 2009). In response to an increasing number of requests from Gold Coast residents and community groups, Council conducted a trial Common Myna bird management program in the Currumbin-Palm Beach area, in 2011. The trial was based on successful community-led Common Myna bird management programs undertaken within the ACT and New South Wales and has been well supported by the local community. The aim of the trial was to provide information to the community about the species and offer the community resources to humanely capture and euthanase Common Myna birds. Council intends to extend this program across the city in the future.

At present, there are no apiary sites located in the planning area and no new site licenses will be granted. Regulation of the honey industry by the Queensland Government aims to minimise the spread of various bee diseases, and weed and plant pathogens such as *Phytophthora*. The effects, either detrimental or beneficial, of honey bees in conservation reserves is not well understood and requires assessment before allowing bee keeping in the planning area.

The *Land Protection (Pest and Stock Route Management) Act 2002* identifies pest animal species and criteria for their control. A number of Class 2 pest animals are likely to occur within the planning area (Table 7).

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Class¹</th>
<th>GCCC priority²</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Rhinella marina</em></td>
<td>cane toad</td>
<td>Non-declared</td>
<td>Low</td>
</tr>
<tr>
<td><em>Vulpes vulpes</em></td>
<td>fox</td>
<td>Class 2</td>
<td>Medium</td>
</tr>
<tr>
<td><em>Canis familiaris</em></td>
<td>feral dog</td>
<td>Class 2</td>
<td>High</td>
</tr>
<tr>
<td><em>Felis catus</em></td>
<td>feral cat</td>
<td>Class 2</td>
<td>Low</td>
</tr>
<tr>
<td><em>Oryctolagus cuniculus</em></td>
<td>rabbit</td>
<td>Class 2</td>
<td>—</td>
</tr>
<tr>
<td><em>Lepus capensis</em></td>
<td>brown hare</td>
<td>Non-declared</td>
<td>—</td>
</tr>
<tr>
<td><em>Mus musculus</em></td>
<td>house mouse</td>
<td>Non-declared</td>
<td>—</td>
</tr>
</tbody>
</table>
The scheduled control of introduced animals needs to be prioritised in order to better utilise resources. Priority for control is given to those species that:

- are declared or for which a national emergency control program has been declared or are known to be an important problem in other conservation areas or states
- have significant environmental impact, including damage to threatened species, catchment values and recreation values
- may affect neighbouring lands or are considered of high priority by the community
- require management to maintain benefits gained from previous control programs or to allow another high priority management program to be effective
- where a window of opportunity to control the species occurs.

The control of pest animals on adjoining lands is also critical to the long-term management of vertebrate pests within the planning area. Therefore, partnership agreements with adjoining private landowners and DNPRSR would assist in developing a coordinated pest animal control program. Research into the ecological effects of pest and domestic animals on the native plants and animals, and monitoring of population sizes are essential to establish the criteria for non-native animal management.

Under Local Law 12 Part 9 (55), Tarrabora Reserve is a dog prohibited area. This has been implemented to further protect the habitat values for species easily disturbed by the presence of domestic dogs. The majority of other reserves are categorised as dog on-leash areas.

Following consultation with park user groups in 2005, Schusters Park was zoned into four different areas, to protect public safety and provide recreational space for users with conflicting interests (Figure 4). Mown sections of the park contain a dog off-leash zone (horses not permitted), horse riding zones (dogs prohibited) and a shared horse riding and dog on-leash zone. Schusters Park peninsula is dedicated as a nature zone, with horses permitted along hardened tracks and dogs not permitted. Maps clarifying these zones are located at the Heather Street car park and near the playground and picnic shelters and the majority of park users appear to be complying with the zoning. However the signs have become faded and need replacing, and access restrictions to the peninsula, in particular, require clarification. Additional maps at the 19th Avenue access and peninsula access would assist park users to identify the location of different zones.
4.7.2 Desired outcomes

- Reduced impacts of pest animals on native flora and fauna.
- Improved public understanding of, and support for, pest animal management programs within the planning area.
- The neighbouring community is well educated with regard to responsible pet ownership.

4.7.3 Management strategy

4.7.3.1 Guidelines

G7.1 Ensure pest animal control programs utilise best practice techniques that minimise impacts on non-target species and comply with animal welfare practices set out in the *Animal Care and Protection Act 2001*.

G7.2 Limit the number and length of roads in reserves to the minimum required for fire and maintenance access.

G7.3 Where possible, pest management activities should be implemented at a landscape scale, in coordination with other land management agencies.

G7.4 Ensure that clear and appropriate notice is provided to visitors and local residents during pest animal control programs. Where a perceived threat to the public exists, or is likely to exist, exclude public access to relevant reserves. Signage informing visitors of any temporary closures is to be erected at all public access points.
G7.5 Natural areas operations officers to continue to support Council’s animal management officers in undertaking existing programs for the control of pest animals in the planning area. Ensure that adequate notice is provided to natural areas operational staff prior to all pest animal control activities to enable closure of all or part of the planning area where required.

G7.6 Wherever possible, utilise pest animal control strategies that include multiple control methods, target multiple species, and form part of an integrated, strategic and collaborative program.

G7.7 No permits will be issued for bee keeping within the planning area.

4.7.3.2 Actions

A7.1 Establish baseline data on pest impacts to inform ongoing pest management programs.

A7.2 Provide incidental records relating to pest animal sightings, movement routes, dens, trap sites and bait locations to Council’s animal management officers.

A7.3 In accordance with the signage plan (see Action 9.2), Parks Gold Coast to replace faded maps showing dog and horse exercise zones in Schusters Park at Heather Street car park and picnic area, and install additional maps at Nineteenth Avenue and peninsula access points.

A7.4 Council’s animal management officers to conduct periodic patrols at Schusters Park and Tarrabora Reserve to monitor dog exclusion/on-lead regulations.

4.7.4 Key monitoring priorities

- Assessment of impacts of pest animals on population viability of flora and fauna species of conservation significance (e.g. koalas) at key reserves (e.g. Elanora Conservation Area).
- Ongoing incidental monitoring of any native fauna fatalities caused by pest animals.
- Impacts of pest animal control programs on target and non target species.

4.8 Aboriginal and European heritage

4.8.1 Current management situation

4.8.1.1 Aboriginal cultural heritage

Aboriginal communities have an ongoing association and connection to country. The natural values of the land and water are central to aboriginal spirituality and contribute to Aboriginal identity. Council recognises that Aboriginal people often retain a strong and ongoing association with the land in conservation reserves. Indigenous Australians have economic and community development aspirations and need to maintain a customary responsibility to care for country, and to continue their close association with it. Partnerships with the local Aboriginal community are therefore considered a priority to ensure appropriate understanding, recognition, conservation and management of cultural values in the planning area.

No formal studies relating to Aboriginal heritage have been conducted within the reserves, therefore little is known regarding particular sites of significance, although there are historical records of Aboriginal use of the area. Council is not aware of direct Aboriginal involvement or use of Elanora-Palm Beach reserves. To promote better cultural heritage management in the planning area further research may be required to identify and record sites of significance. To
ensure protection of cultural heritage values and maintenance of cultural integrity, Council’s indigenous cultural heritage officers will consult with relevant Aboriginal groups before commencement of any development works. This consultation will be carried out via Council’s Indigenous Cultural Heritage Liaison Officer. The Gold Coast Native Title Group currently have a native title claim registered over the area (ref QC06/10-2).

Council has an obligation to manage its land in accordance with the Queensland Aboriginal Cultural Heritage Act 2003. This legislation places a duty of care upon Council to protect items and places of cultural heritage significance. As part of this duty of care, an assessment of cultural heritage values is required where construction or any other ground disturbance is proposed, to identify cultural heritage values and prevent the inadvertent destruction of sites and values. Cultural heritage surveys carried out in accordance with Section 28 – Duty of Care Guidelines of the Aboriginal Cultural Heritage Act 2003, may therefore be required prior to construction of built infrastructure.

4.8.1.2 European heritage

The Queensland Heritage Act 1992 is written in the spirit of the Burra Charter and the Queensland Heritage Council has adopted this charter as a guide to decision making under the Heritage Act and to guide work in heritage registered places (DERM 2010c). The Burra Charter, or Australia ICOMOS Charter for the Conservation of Places of Cultural Significance, is a nationally accepted standard of practice for those who provide advice, make decisions about, or undertake works to places of cultural significance, including owners, managers and custodians (Burra Charter: Australia ICOMOS 1999). It defines the basic principles and procedures to be followed in the conservation of heritage places (DERM 2010c).

The relics of early European settlement across the Gold Coast provide evidence of how the current identity of the region was forged. Council actively assists in the preservation of European cultural heritage values by meeting its obligations under the Queensland Heritage Act 1992, protecting sites that are on the State’s Heritage Register and the Gold Coast Local Heritage Register. There are no known significant European heritage sites or features in the planning area. Therefore, it may be necessary to undertake assessments to determine the extent of remaining evidence and to identify and record significant sites or features.

4.8.2 Desired outcomes

- Cooperative and integrated management of Aboriginal places and objects within the planning area with the Aboriginal community and relevant agencies.
- Sites, places and landscapes of significance are identified, conserved and protected from damage.
- Increased public appreciation and understanding of local heritage values.

4.8.3 Management strategy

4.8.3.1 Guidelines

G8.1 Consult Council’s indigenous cultural heritage officers, Aboriginal people with traditional affiliations to the planning area (eg Gold Coast Native Title Group) and relevant State and Commonwealth Aboriginal heritage authorities, in decisions regarding the management of Aboriginal cultural heritage, including identification of sites, and actions to protect objects, sites and landscape features.

G8.2 Where appropriate and consistent with GCCC signage policy and guidelines, include Aboriginal language names for natural and cultural features and values on interpretive signage within the planning area.
G8.3 Seek agreement from the local Aboriginal community before providing information to the general public regarding the location of any Aboriginal sites and places.

G8.4 Seek agreement on content/information from the local Aboriginal community before installing interpretive information regarding Aboriginal cultural values.

G8.5 Ensure that Council staff working within the planning area undertake Council’s cultural heritage awareness training when this becomes available.

G8.6 Support Aboriginal community proposals to research Aboriginal cultural heritage values within the planning area.

G8.7 All works involving ground disturbance are to be carried out in accordance with Section 28 – Duty of Care Guidelines of the Aboriginal Cultural Heritage Act 2003 and the Australia ICOMOS Burra Charter 1999, including preparation of a Cultural Heritage Management Plan or Cultural Heritage Management Agreement where recommended as the result of a cultural heritage assessment.

G8.8 Ensure all operations are carried out in accordance with the Queensland Heritage Act 1992.

G8.9 Consult Council's heritage officers and, where appropriate, involve local historians or historical societies, and other interested members of the community, in the identification, assessment, planning and management of European heritage values within the planning area.

G8.10 Schedule assessments of known sites of cultural significance to monitor condition of artefacts and determine whether remedial actions are required.

4.8.3.2 Actions

A8.1 In consultation with the local aboriginal community, provide interpretation/educational infrastructure and/or material to promote public appreciation and understanding of aboriginal sites, landscape features and heritage values within the planning area.

A8.2 In consultation with Council’s heritage officers, provide interpretation/educational material where appropriate to foster public appreciation and understanding of local heritage values.

4.8.4 Key monitoring priorities

- Scheduled assessments of the condition of sites of Aboriginal or European cultural significance to be undertaken.
- Regular ranger patrols to monitor disturbance/damage to known sites/areas of Aboriginal cultural heritage, as identified during the cultural heritage assessment.
- Monitoring to assess for any negative impacts on Aboriginal cultural heritage values resulting from management actions.

4.9 Recreation opportunities

4.9.1 Current management situation

The South East Queensland Outdoor Recreation Demand Study 2007 (SEQORDS) (Queensland Government 2007) presents data on the types and participation rates of
outdoor recreation activities undertaken by residents of South East Queensland. The 2007 SEQORDS study builds on two previous similar surveys conducted in 2001 and 1997. The study indicated that picnicking is the most popular outdoor recreational activity in South East Queensland and that bicycling, camping and driving other vehicles (i.e. trail bikes) are increasing in popularity. Other activities such as walking and horse riding showed a decline in participation when compared with earlier studies. The study found that overall, demand for outdoor recreation activities is likely to increase and that this is likely to result in more pressure on natural areas (Queensland Government 2007).

The Elanora-Palm Beach reserves contribute to the health and lifestyle of nearby residents by providing areas where nature experience activities can be undertaken, space for daily exercise and visual amenity afforded by the presence of native vegetation. Enhancements for existing nature-based recreation activities in the area are proposed to improve nature experiences for residents. Activities within the planning area (and in adjacent recreation parks), including bushcare groups, creek tours, bushwalks etc are promoted through Council’s Active and Healthy programme.

A number of factors currently discourage recreational use of some of the Elanora-Palm Beach reserves including small size, lack of access and/or public parking facilities and lack of connectivity with existing recreation pathways and/or other reserves. Recreational opportunities associated with the reserves are not always well publicised and recreational use of the reserves could be considered relatively low in comparison to other management clusters (e.g. Springbrook or Coombabah). Although current recreational use is generally low, several of the reserves are utilised for activities including bushwalking, horse riding, cycling, nature appreciation, swimming, picnicking, barbeques, photography and other passive nature-based pursuits. It is essential that future uses and demand are a major consideration in the planning process.

Within the planning area, natural values will dictate recreational uses that are compatible with each reserve. Formal recreation zones within the surrounding park network (eg. at Schusters Park and Eddie Kornhauser Recreational Reserve) provide significant scope for complementary active recreational experiences. Visitor use of the planning area will be managed to maintain a high-quality nature-based recreational experience that is consistent with nature conservation and threatened species legislation, and maximises opportunities to generate community interest in and support for Council’s nature conservation objectives. For the purposes of this management plan, nature-based recreation can be defined as activities that:

- are dependent on the natural environment (i.e. the natural environment is critical to the participation and satisfaction of the participants)
- have an appreciation of nature as a key motivational factor
- do not require substantial modification to the natural environment
- are environmentally sustainable, as determined by an ongoing monitoring program of impacts.

Existing impacts associated with current recreational uses in the planning area include: erosion, soil compaction, vegetation damage, introduction and spread of pest species, increased fire risk, fauna disturbance, and littering. Inappropriate recreational use of some reserves has been a recurrent problem. Unauthorised trail bike usage is occurring at Schusters Park peninsula and Elanora Conservation Area and has caused significant ground disturbance.

Management of existing recreational use must aim to minimise impacts of damaging or incompatible activities. Considerable effort has been expended to restrict access to reserves for high impact, illegal or unapproved activities (for example trail bike riding at Schusters Park, which conflicts with other user groups such as horse riders and walkers). It is
anticipated that improving opportunities for low-impact and sustainable recreational track networks, corresponding use and appreciation of these reserves for nature-based activities, and implementation of further control measures will result in a reduction in prohibited activities. The likelihood of increased interaction with other visitors and/or Council staff is expected to diminish opportunities for inappropriate use of reserves.

Population increases within the Elanora-Palm Beach management cluster are likely to place increasing pressure on reserves through corresponding increases in recreational demand; hence, it is essential that future uses and demand are a major consideration in the planning process. Furthermore, the design and location of recreational nodes must consider community and visitor requirements, recreational demand, site suitability, access, costs, threats, biodiversity impacts, and long-term management implications.

The planning area is valued highly by many local residents for its wildlife, visual amenity and natural and recreational values. Protection of these values and features can be best achieved if visitors to the area are aware of the significance of the planning area and surrounds. This appreciation will be promoted through the provision of interpretive material which will facilitate an understanding of the issues which impact upon conservation and management in the area.

There is opportunity to link existing walking and cycling paths in Elanora with planned public transport nodes such as the Tallebudgera Rail Station (to be located near the Pacific Motorway/Tallebudgera Creek crossing) and existing walking and cycling path networks in the Burleigh area. These and other opportunities for enhancing recreational opportunities and connectivity between recreational and conservation parks in the planning area are discussed in the following sections.

4.9.1.1 Walking

A number of recreational walking opportunities are available in the planning area. There are approximately 3.5 kilometres of tracks through Schusters Park, which pass through mown recreational park and native bushland (Figure 2). The Schusters Park peninsula track, which follows the eastern edge of the peninsula, provides easy access to a diversity of coastal ecosystems (paperbark forest, coastal she-oak open forest, mangroves and saltmarsh), making it a suitable location for an interpretive nature trail. The peninsula track is already well utilised, owing to its proximity to popular day use facilities (Rotary Park), car parking and connectivity with other concrete paths along Tallebudgera Creek in the upstream section of Schusters Park. Some upgrades to this track are required to improve drainage and reduce degradation of informal tracks on adjacent State land, where damage to protected mangrove vegetation is occurring (refer to section 4.10.1.2).

Tracks through Schusters Park, Elanora Wetlands Reserve and adjacent vegetation at Elanora Water Treatment Plant are components of Council’s long term plans to provide enhanced connectivity between existing walking paths (i.e. concrete, boardwalks) in the Burleigh and Elanora suburbs. A Burleigh-Elanora connection would provide opportunity for an extended nature appreciation walk from Tallebudgera Creek Conservation Area to Schusters Park. However, this connection will require construction of a bridged crossing over Tallebudgera Creek, plus additional track segments and elevated boardwalks through mangrove, paperbark forest and saltmarsh vegetation. The environmental impacts associated with the proposed infrastructure requires further assessment to determine its appropriateness and feasibility. In the short term, a signage plan will be developed for Elanora Wetlands and Schusters Park (see Action 9.2).

Walking tracks through Tarrabora Reserve (1.5 kilometres) and Beree-Badalla Reserve (0.8 kilometre boardwalk) are also ideally situated to provide for interpretive nature walks, with good access to large residential areas, adjacent car parking and day use facilities and
connectivity to a larger track network along Currumbin Creek foreshore and to the Gold Coast Oceanway. Interpretive signage is proposed for these reserves to inform visitors about coastal-estuarine ecosystems and cultural heritage, highlight restoration works and foster responsible visitor behaviour.

Eddie Kornhauser Recreational Reserve contains over 6 kilometres of walking tracks, which pass through recreation park and bushland areas. Under the PIP program, an additional 2.5 kilometres of concrete walking paths are proposed in the Casuarina Drive section, along with other day use infrastructure (described below).

A section of the Gold Coast Oceanway runs through Tarrabora Reserve. The Oceanway is a 36 km network of shared use pathways along beaches from the gold Coast Seaway (The Spit) to the Point Danger Lighthouse (Coolangatta), providing pedestrians and cyclists with access to a wide range of coastal environments, including coastal vistas, headlands, mangroves and littoral rainforest.

Although the public have access to the fire management trail at Elanora Conservation Area, the short length of the track (approximately 550 metres) reduces its value for bushwalking. Additionally, the track is relatively steep and the formation of switchbacks that would improve public use (by reducing difficulty level) is not recommended given the high ecological value of the area and limited benefits given the short track length. However, the trail will be improved through the installation of whoa boys and drains for fire management access, which will also improve public access to a degree.

There is a half-kilometre long concrete walking track through eucalypt woodland in Currumbin Waters Park and local residents have established an informal walking track along the western boundary of Avocado Park, which is used as an alternative route for travelling north – south parallel to Doubleview Drive. This track is to be included in the formal track network and surface improvements are to be undertaken to improve walker safety.
4.9.1.2 Day use

Day use facilities are available at recreational parks adjacent to nature conservation zones in Schusters Park, Eddie Kornhauser Recreational Reserve, Tarrabora Reserve, Beree-Badalla Reserve, Barlee Court Reserve and Palm Beach Parklands (Figure 2). Numerous other formal recreation parks in the management cluster also provide day use facilities to the public.

Additional day use facilities are proposed for Eddie Kornhauser Recreational Park (near Casuarina Drive) as part of the PIP program. New facilities and embellishments planned will include barbeques, bike racks, fitness stations, water fountains, walking paths, seats, signage, and landscaping. These new facilities, and subsequent increases in public use of the area, are not expected to incur notable impacts on adjacent NAMU managed conservation areas.

4.9.1.3 Horse and carriage riding

Horse and carriage riding are popular recreational activities in the management cluster. There are three horse and carriage clubs in (or directly adjacent to) the cluster: 1) Currumbin District Horse Club (Tierney Park, Elanora), 2) Tallebudgera Pony Club (Andrews Park, Tallebudgera) and 3) Gold Coast Horse and Carriage Club (Schusters Park).

The Tallebudgera Pony Club holds a lease over Council’s Andrews Park, located on Andrews Road, west of Tallebudgera Connection Road. The club has training and dressage pens onsite and also utilises the majority of the 9 hectares of remaining park area which is comprised of paddocks. Currumbin District Horse Club is located at Tierney Park on Galleon Way. The Currumbin club utilises training pens, and large outdoor riding arena and paddocks that are located in the park. Gold Coast Horse and Carriage Club, located at Schusters Park, utilises paddocks and a dressage arena that are located in the western section of the park.

Council’s long term planning flags a potential additional horse trail to be established within undeveloped road reserve located east of Tallebudgera Creek Connection Road and north of Currumbin Creek Road. If established, the new trail would provide horse riders with a scenic connection route between the Tallebudgera Pony Club and Currumbin District Horse Club sites. This trail would be located outside NAMU reserves.

Efforts were made to resolve conflicts between riders and other park user groups through community consultation in 2005, resulting in the zoning of Schusters Park into different areas for horse riding and dog walking (see Section 4.7.1). Horse riding is currently permitted in western and central parts of the park, excepting the dog off leash area south of the oxbow. Horse riding is also permitted along tracks in the peninsula section of Schusters Park. Where the hardened track ends, an informal track has been created, which is heavily eroded and potentially unsafe for horse riders. Given these constraints, it is recommended that horse riding is restricted to the hardened track that follows the eastern side of the peninsula. This track will be upgraded to maintain a suitable standard for riding (refer to Section 4.10.1.2 and Actions 10.8-10.9)

Horse riding trails within the planning area should be wide enough to operate as shared use tracks with bushwalkers and maintenance vehicles. All trails deemed suitable for horse riding (by NAMU operations staff) will be clearly demarcated and gates, horse step-overs and fences will be established as required, to prevent access into environmentally sensitive and/or dangerous parts of the site (e.g. creek crossings, track sections with steep gradients, and damp areas vulnerable to erosion, weed colonisation, and fungal invasion).
4.9.1.4 Mountain/ BMX biking

The footpath network through Eddie Kornhauser Recreational Reserve and Schusters Park provide good opportunities for road cycling, particularly for families. However, due to the relatively small size and fragmentation (i.e. not linked by public land) of the reserves, few quality mountain biking experiences are available in the management cluster. A number of informal trails (i.e. not established or promoted by Council) have been established in the planning area by mountain bikers. Existing fire and access trails are also used in some areas. Informal mountain bike trails are present at Schusters Park (Elanora wetlands and peninsula sections). These trails are short and located on flat terrain. It is likely that they are ridden by only a few users.

The feasibility of providing BMX (bicycle motocross) facilities at Elanora Oval will be investigated under this plan. The NAMU managed portion of Elanora Oval is vegetated with slash pine (*Pinus elliottii*); this combined with the fragmented (surrounded by urban area) characteristics of the site result in low ecological value for the area. A skateboard park is present at Elanora Oval and the addition of a BMX track would augment youth recreation facilities in the area.

4.9.1.5 Nature observation

The planning area contains a variety of coastal, wetland, riparian and dry sclerophyll (e.g. Eucalyptus forest) ecosystems and ecotones (i.e. interfaces of these ecosystems). These ecosystems support diverse flora and fauna assemblages and provide numerous opportunities for wildlife observation. Memorable nature observation can be experienced at Schusters Park peninsula, Elanora Wetlands Reserve, Tarrabora Reserve, Beree-Badalla Reserve, Elanora Conservation Area, Tallebudgera Creek Conservation Area and while canoeing or kayaking along Tallebudgera Creek.

The primary nature observation planning goal for the reserves is to enhance opportunities (and experiences) at sites where the activity can currently be readily undertaken. This will be accomplished by installing nature appreciation signage along the Schusters Park peninsula section track, Elanora Wetlands Reserve track, Tarrabora Reserve track and the Beree-Badalla Boardwalk (see 4.9.1.1 above).

4.9.1.6 Paddlecraft

Paddling along the eastern sections of Currumbin Creek and Tallebudgera Creek is a relatively popular activity. A considerable amount of mangrove, she-oak open forest and saltmarsh vegetation remains in the tidal reaches of Tallebudgera Creek. Much of these vegetated areas are protected by Tallebudgera Creek Conservation Area (managed by DERM) and the Schusters Park reserves. The presence these naturally vegetated tidal sections of Tallebudgera Creek provides excellent opportunity for kayaking in a high value natural setting.

The feasibility for a new launching/landing point to improve access to the upper sections of Tallebudgera Creek, and to expand the current landing point network, will be investigated as part of this plan. Preliminary assessment of sites in and around Schusters Park indicated a possible site near the old Tallebudgera Connection Road – Tallebudgera Creek timber bridge crossing, located directly upstream from the current crossing point. The site is readily accessible and contains areas suitable for parking. However, the banks are relatively steep, and would require construction of steps and a launching/landing structure. Design of the launching/landing structure will need to consider the flow regimes of the creek given that flood waters regularly transport large woody debris through the area. It may be possible to establish a new launching/landing point under the PIP program.
4.9.1.7 Recreational fishing

Recreational fishers frequently fish the lower (tidal) sections of Currumbin Creek and Tallebudgera Creek, either by shore access or boat. There are a number of historic fishing boat landing points on Schusters Park peninsula. The landing points have been established by shallow excavation to improve shore access. Dilapidated fish cleaning stations are also present at these sites. It appears that these boat landings are not frequently used, and they pose localised risk for bank erosion. Public use of these sites should be monitored to determine if management actions (e.g. bank stabilisation, restoration) are needed.

4.9.2 Desired outcomes

- Sustainable, nature-based recreational opportunities are provided which are consistent with the protection, appreciation, and understanding of natural and cultural values and ecological processes within the planning area.
- New nature-based recreation opportunities are complementary and designed within the context of existing opportunities within the locality and region.
- Community support is generated for the protection of the planning area’s values through the provision of appropriately designed recreational infrastructure.
- Facilities are designed and managed to provide a satisfying and safe visitor experience.

4.9.3 Management strategy

4.9.3.1 Guidelines

G9.1 Within conservation zones, recreational infrastructure and activities should be developed in accordance with this management plan.

G9.2 Maintain walking tracks outlined in this management plan with the aim of minimising disturbance to landform features and reducing impacts on native plant and animal communities by minimising impacts on ecologically significant areas.

G9.3 Construct walking tracks in accordance with the Australian Standards for Walking Tracks (AS 2156.1-2001 and AS 2156.2-2001) and the Gold Coast City Council’s Recreational Trail Design Guidelines (GCCC 2002) which incorporates NAMU’s walking track construction specifications.

G9.4 Future consolidation and development of the recreational track network within the planning area should be informed by monitoring data on levels of use, where regularly used tracks are upgraded to minimise erosion and degradation, and infrequently used tracks are considered for closure and rehabilitation.

G9.5 Tracks and other recreational facilities shall be closed during times in which repairs are required and/or where safety risks are identified.

G9.6 Principles of equitable access are to be incorporated, where possible, into the design of recreational facilities.

G9.7 Ensure that all relevant planning approvals are sought from appropriate Local and State government departments prior to the construction of any recreational infrastructure.

G9.8 Facilities are planned and constructed in accordance with Crime Prevention Through Environmental Design principles wherever possible.

G9.9 Recreational or remote camping, trail bike riding and four-wheel drive use (except for management purposes) will not be permitted within the planning area.
**G9.10** Ensure access points are easy to locate and tracks are well coordinated in the planning area.

**G9.11** Proposed infrastructure or embellishments within conservation zones should be assessed with regards to compliance with Local and State environmental legislation, cost, site constraints, environmental and cultural impacts, community demand and consistency with other objectives of this management plan.

**G9.12** Infrastructure retained and installed in the planning area must be identified and managed consistent with relevant Council asset management plans developed by Engineering Assets and Planning and Parks and Recreational Services.

**G9.13** Liaise with DNPRSR and other government agencies to ensure coordinated nature-based recreation planning throughout the planning area and broader region.

### 4.9.3.2 Actions

**A9.1** In consultation with Gold Coast Parks, implement a city-wide recreational demand study to identify the future need for additional nature-based recreational facilities within the planning area, incorporating monitoring data for existing recreational uses at or near the planning area. Where demand is identified, undertake a feasibility assessment to identify suitable locations within the planning area or opportunities on adjacent private properties.

**A9.2** Prepare and implement a Signage Plan for Schusters Park and Elanora Wetlands, in accordance with the planning area Interpretation Plan (refer to Section 4.13.3.2), to include/address the following:
- location and functionality of existing signage
- replacement of zoning maps to clarify permitted dog walking and horse riding areas
- responsible pet ownership practices for reducing impacts on wildlife
- nature interpretation (see Section 4.13 for topics) and restoration area signage to be installed along peninsula trail and in Elanora Wetlands
- signage on Tallebudgera Creek Road (approximately 100 m east of Heather Street) to inform drivers travelling west of entrance via Heather Street.
- as per Action 7.3, Parks Gold Coast to replace faded maps showing dog and horse exercise zones in Schusters Park at Heather Street car park and picnic area, and install additional maps at Nineteenth Avenue and peninsula access points

**A9.3** Prepare and implement signage plans for Tarrabora Reserve, Beree-Badalla Reserve and Eddie Kornhauser Recreational Reserve, in accordance with the planning area Interpretation Plan (refer to Section 4.13.3.2), to provide information regarding:
- restoration works,
- nature interpretation (see Section 4.13 for topics),
- indigenous cultural heritage and historic use (in consultation with relevant indigenous groups),
- impacts of detrimental activities including, littering, dumping green waste, tree clearing and unauthorised vehicle or domestic animal access.

**A9.4** Investigate the potential impacts (and feasibility) of the proposed link from Schusters Park to Burleigh. The possible impacts of a pedestrian footbridge over Tallebudgera Creek (at Schusters Park) and the installation of a walking track and boardwalk through the Elanora Wetlands area require further assessment.

**A9.5** In consultation with Gold Coast Parks, investigate the feasibility of establishing a mountain bike/BMX skills track at Elanora Oval.
A9.6 Council’s engineering assets and planning officers (in conjunction with DTMR) to investigate the feasibility of establishing a new kayak landing/launching point at the old Tallebudgera Connection Road – Tallebudgera Creek timber bridge crossing. It may be possible to establish a new launching/landing point under the PIP program.

A9.7 Monitor the potential impacts of boat landing points at Schusters Park peninsula to determine if erosion control or bank stability measures are needed.

A9.8 Provide information (including downloadable maps) on Council’s website relating to key recreational opportunities within the planning area, including:
- Adding Schusters Park, Tarrabora Reserve and Beree-Badalla Reserve to the ‘Exploring nature’ category of the Gold Coast Parks - park finder internet search tool,
- Adding reserves containing good bushwalking tracks (including Schusters Park) to the Gold Coast Parks ‘Bushwalking’ webpage, along with a short description of the walks and natural features that can be observed.

A9.9 Undertake regular weekday and weekend ranger patrols of the planning area to monitor visitor safety and usage along formal and informal recreation tracks, to encourage safe and appropriate use by visitors, and to control prohibited activities.

A9.10 Commission regular arboricultural assessments where potentially hazardous trees are identified within the vicinity of visitor infrastructure. Prune or, where no alternative exists, remove trees which have been identified as posing an unacceptable safety risk.

A9.11 Maintain records of safety incidents, hazards and inappropriate use observed during ranger patrols or by the public, to inform future planning and risk management.

4.9.4 Key monitoring priorities

- Visitor use and demand studies to assess variables such as: visitor numbers, levels of recreational use, preferred activities, visitor demographics, conflicts between different recreational uses, and public demand for new or different nature-based recreational opportunities.
- Visitor impact monitoring to assess environmental impacts associated with specified recreational activities. Impact thresholds and appropriate management responses should be established in conjunction with this monitoring program.
- Monitor recreational facilities to ensure that they are being used appropriately, and are maintained in a safe and operational condition.

4.10 Built infrastructure and Access

4.10.1 Current management situation

4.10.1.1 Built Infrastructure

The reserves contain various levels of infrastructure ranging from minor infrastructure such as shelters, gates, signage and fencing to a small amount of built infrastructure, limited to power lines. Access easements and tracks are discussed in Section 4.11 and thus are not addressed here. The locations of day-use infrastructure is described in section 4.9.

Energex holds a number of power line easements that bisect the reserves (Table 10). Approximately 140 metres of 33kV power line easement corridor is present in the southern section of Schusters Park. The 33kV line is oriented roughly north to south through the park and bisects a reserve area that surrounds a remnant oxbow of Tallebudgera Creek. An additional 60 metres of 11kV corridor is present near the northern boundary of the park. This
line bisects paperbark open forest located on the southern bank of Tallebudgera Creek. An 11 kv corridor (approximately 115m) is present in a section of Eddie Kornhauser Recreational Reserve that is comprised of disturbed vegetation and mixed Eucalyptus woodland.

A horse dressage arena has been constructed in the south-western section of Schusters Park. The arena was built and is used by the Gold Coast Horse and Carriage Club.

A small shelter is present in the peninsula section of Schusters Park. This structure is in poor condition and is not formally used, although there is evidence that it is periodically used as a site for illegal fires, and is encouraging graffiti and vandalism. It is recommended that the shelter is removed and the surrounding area rehabilitated, with the access track narrowed to allow pedestrian access only through to the western side of the peninsula. Alternative picnic shelters are located 700 metres away in the Rotary Park day use area within Schusters Park.

Table 8. Easements in the Elanora-Palm Beach Conservation Reserves

<table>
<thead>
<tr>
<th>Location</th>
<th>Easement Description</th>
<th>Easement Purpose</th>
<th>Easement Grantee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Currumbin Waters Park L58 RP222778</td>
<td>Easement no. 601253656 (J962364H)</td>
<td>Right of way</td>
<td>Austral Development Pty Ltd.</td>
</tr>
<tr>
<td>Barlee Court Reserve L903 RP889546 L905 RP889546</td>
<td>Easement A on RP99488</td>
<td>Critical Infrastructure Easement; water supply purposes</td>
<td>Queensland Bulk Water Transport Authority</td>
</tr>
<tr>
<td>Schusters Park L506 RP174004</td>
<td>Easements B &amp; D on RP99489</td>
<td>Water supply purposes</td>
<td>Queensland Bulk Water Transport Authority</td>
</tr>
<tr>
<td></td>
<td>Easements G &amp; H on RP906323</td>
<td>Electrical works</td>
<td>South East Queensland Electricity Corporation Ltd (now Energex)</td>
</tr>
<tr>
<td></td>
<td>Easement AE &amp; AF on SP221700</td>
<td>Infrastructure corridor</td>
<td>Queensland Bulk Water Transport Authority</td>
</tr>
<tr>
<td>Schusters Park L2 SP236797</td>
<td>N/A</td>
<td>Electrical works</td>
<td>Note: An Energex 11 kV power line bisects this property but no easement exists.</td>
</tr>
</tbody>
</table>

Queensland Rail (QR), Energex and the Queensland Department of Transport and Main Roads (DTMR) are proposing upgrade works involving expansion of the heavy rail line and construction of new rail stations, installation of a 11 kv, 33 kV and 110 kV power lines and additional connection roads and ramps along the Pacific Motorway (M1) between Mudgeeraba and Tugun. Upgrade works are not likely to begin within the lifetime of this plan (10 years), and will include the construction of the new Tallebudgera Rail Station, to the west of Tallebudgera Creek and immediately south of the Pacific Motorway. Recent designs indicate that access to the rail station will be provided via a new connection road (and associated ramps) to be constructed south of the station. This will require the construction of an additional bridge crossing over Tallebudgera Creek (south of the existing Pacific Motorway bridge). The expanded rail alignment will be located between the Pacific Motorway and the new connection road. The proposed works would impact vegetation located at the northern end of Elanora Wetlands Reserve.

Derelict built infrastructure and related debris such as damaged fences, wire, old timber, rubbish piles and cubby houses etc are scattered throughout the reserves. Any such remains are to be removed unless deemed to be of significant cultural value as a result of a cultural heritage assessment.

4.10.1.2 Access
The reserves have various degrees of accessibility, ranging from no access to well-formed and maintained fire trails. The majority of tracks in the planning area are established management trails that have become multi-purpose and are used for management purposes such as ranger patrols, fire management, restoration programs, feral animal control, and site assessments. These management trails often need to be managed to allow for four-wheel drive access to areas. In addition to the existing management trails, a number of additional access routes (bushfire protection zones) are proposed in the Elanora Conservation Reserves Bushfire Management Plan (AECOM 2009). Informal tracks not currently used require closure and rehabilitation.

Council’s Parks and Recreation Branch is the asset owner for the majority of access tracks in the planning area, however the Oceanway (which runs through Tarrabora Reserve) and all bikeways and dual use pathways are assigned to Council’s Manager of Engineering Assets and Planning.

The track along the eastern side of Schusters Park peninsula track requires surfacing upgrades (e.g. re-contouring, gravel surfacing) in areas that collect surface water following rain events. This track is proposed for an interpretive nature trail (section 4.9.1.1) and improved access is needed to facilitate public use and maintain suitable conditions for horse rider access (section 4.9.1.3). Informal tracks leading from this track into mangrove and salt marsh vegetation are causing damage to these ecosystems and require closure and rehabilitation.

The informal track used by Palm Beach-Currumbin State High School kayakers to access Currumbin Creek from Beree-Badalla Reserve requires upgrading to reduce the extent of impact on mangrove vegetation, in conjunction with proposed restoration works at this site (refer to Action 6.4).

Local residents have established an informal walking track along the western boundary of Avocado Park. This track is to be included in the formal track network and enhanced (e.g. install tread steps and path surfacing) to improve safety.

4.10.2 Desired outcomes

- The location, operation and maintenance of built infrastructure is consistent with and designed in light of the planning area values.
- Built infrastructure is safe, sustainable and cost effective to operate and maintain.
- Built infrastructure (and where practicable, utilities) supports the management and conservation of the planning areas biodiversity, natural systems and processes.
- Maintenance access is facilitated in appropriate and necessary locations only.
- Safe access for public, management and fire fighting vehicles.
- The environmental impact of management vehicles is minimised, with sensitive and significant areas protected from inappropriate vehicle access.

4.10.3 Management strategy

4.10.3.1 Guidelines

**Built Infrastructure**

**G10.1** Locate new built infrastructure and facilities on disturbed or degraded sites wherever possible.

**G10.2** Ensure that all relevant planning approvals are sought from appropriate Local and State government departments prior to the commencement of any works on-site.
G10.3 Design and install all new built infrastructure with due consideration to the whole of life costs associated with the asset. Where practicable select durable, low-maintenance materials that are easy to source and replace, and are positioned in locations that will not expose them to unnecessary impacts or wear.

G10.4 The design, construction, and appearance of all built infrastructure and visitor facilities is to be of a high standard that is commensurate with the significance of the planning area. These facilities should create a signature appearance that is reflected across all forms of visitor infrastructure. Furthermore, they are to be constructed and designed in accordance with all Council guidelines, manuals and policies relevant to the provision of embellishments and infrastructure within public open space natural areas (e.g. Natural Areas Management Unit Infrastructure Design Guidelines).

G10.5 The Elanora-Palm Beach cluster forms part of theCurrumbin to Currumbin Valley conservation corridor, and as such any management fencing should permit the movement of and minimise harm to fauna.

G10.6 Where upgrades of roads and associated infrastructure on or adjacent to the planning areas is proposed, investigate opportunities for incorporating fauna movement solutions into new infrastructure.

G10.7 NAMU to be consulted as a stakeholder during development assessment process to ensure that developer contributed natural area open space has sufficient access to meet maintenance and other management requirements.

Access

G10.9 Ensure that all access to the reserves is in accordance with Council’s Parks Usage Policy – Temporary Park Occupation and Traverse for Construction Purpose, with the relevant applications made where required prior to access.

G10.10 Exclude all vehicle access from environmentally sensitive areas such as saltmarsh, mangrove and wetland areas.

G10.11 To minimise impacts on sensitive areas, management activities within these areas will be undertaken on foot where possible and in consultation with a Council natural areas ranger. Any necessary access required for ground control of mosquitoes and biting insects will be undertaken utilising purpose-built low-impact 8 wheel Argo (or similar) vehicles. However, the use of these vehicles is to be minimised – it is preferable that helicopters are used to the fullest extent possible.

G10.12 All Council staff or contractors required to access management trails in the planning area for management purposes are to be briefed by the relevant natural areas ranger on their responsibilities as outlined in this management plan.

G10.13 Restrict speed limits to 10km/h on management tracks.

G10.14 Construct and maintain fire trails to appropriate standards as defined by the Bushfire Management Plan (refer to Section 4.5).

G10.15 Construct all new management trails in accordance with relevant trail construction standards, and ensure that their alignment follows the most environmentally sensitive route available.

G10.16 NAMU management planning officers are to actively consult with relevant stakeholders (QR, Energex, DTMR) during the planning and post-construction stages of
significant infrastructure projects (e.g. Pacific Highway and rail upgrades), or prior to maintenance works including those carried out by any other department of Council (e.g. upgrades to roads, drainage infrastructure or recreational park assets), to ensure that NAMU requirements regarding project design, mitigation measures, offsets etc are fulfilled.

**G10.17** Natural areas operations officers to liaise with Energex regarding environmental protection during easement maintenance at Schusters Park

### 4.10.3.2 Actions

**Built Infrastructure**

**A10.1** As a minimum, install naming and regulatory signage at all formal and publicly used entrances to reserves, including signage to indicate OSPL acquired reserves; replace damaged or derelict signs and gates, as required.

**A10.2** Review access and infrastructure layers (signs, gates, management tracks etcetera) on Council's GIS database and advise spatial information officers of required updates.

**A10.3** Remove old shelter shed in Schusters Park peninsula and rehabilitate surrounding area.

**A10.4** Remove or dispose of existing derelict infrastructure (e.g. damaged fences, wire, old timber, rubbish piles, cubby houses) in reserves, where not identified as being of significant cultural value. Rehabilitate cleared sites in accordance with the provisions of relevant restoration plans (Section 4.6), where not required for recreation or management purposes.

**A10.5** Regularly monitor the condition of boundary fencing to ensure it remains effective as a barrier to unauthorised access and repair as required (in consultation with neighbours where necessary).

**A10.6** Where required, install fauna-friendly (e.g. barbless wire), stock-proof fencing along the boundary of the reserves of the planning area to facilitate the unimpeded movement of native fauna species. This may necessitate the modification of existing fencing to provide fauna movement capabilities.

**A10.7** All built infrastructure retained and installed within the planning area is to be placed on a regular maintenance roster involving provision for scheduled and reactive maintenance inspections and activities, as required.

**Access**

**A10.8** Install a gate, fencing and horse step-over at the entrance to the Schusters Park peninsula section to restrict vehicle and motorbike access.

**A10.9** Upgrade track along the eastern edge of Schusters Park peninsula to improve drainage and maintain a suitable condition for pedestrian and rider access.

**A10.10** Close and rehabilitate informal tracks in Schusters Park peninsula where damage to vegetation is occurring and amend access signage accordingly.

**A10.11** Formalise Beree-Badalla Reserve track used by Palm Beach-Currumbin State High School for kayak access to Currumbin Creek.

**A10.12** Formalise the western boundary track at Avocado Park and install treads (stone-like steps) (treads section estimated to be 200 to 300 m in length) to improve user safety.
A10.13 Monitor management tracks to ensure that they are safe and that drainage is functioning effectively; undertake repairs where necessary to avoid ponding of water, erosion and unsafe conditions.

A10.14 Close and rehabilitate roads and tracks not required for public and management vehicle access.

A10.15 Assess width of existing access tracks against bushfire response access requirements and rehabilitate where track width exceed requirements, to minimise extent of disturbed areas.

A10.16 Monitor unauthorised access to reserves and, where necessary, install bollards, signage or other vehicle exclusion devices at entry points of publicly accessible environmentally sensitive areas to restrict vehicular incursion. Ensure these structures are constructed of sustainable materials and are commensurate with the natural landscape.

A10.17 Natural areas operations officers to report illegal vehicle access, including trail bike and four-wheel drive access to Council’s law enforcement officers.

4.10.4 Key monitoring priorities

- Monitor for impacts and/or changes in environmental conditions in areas adjacent to the location of built infrastructure.
- Monitor the recovery of degraded or modified sites after cessation of undesirable uses.
- Regularly assess the maintenance requirements of built infrastructure managed by Council’s natural areas officers, within the planning area and use this information to inform future decisions relating to design and construction materials.
- Monitor the condition and safety of maintenance tracks within the planning area.
- During ranger patrols monitor for newly created unauthorised tracks and impacts associated with management access.

4.11 Leased areas

4.11.1 Current management situation

There are three current leases in reserves of the planning area (Table 11). These leases give exclusive rights of use in the prescribed areas. To varying degrees, these leases may affect the use of the reserves by others and impact on natural and aesthetic values.

Table 9. Leases relevant to the planning area

<table>
<thead>
<tr>
<th>Relevant Reserve, lot and plan</th>
<th>Lease Holder</th>
<th>Lease Expiration Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elanora Oval, 702WD813952</td>
<td>Gold Coast Curling Club²</td>
<td>30 June 2015</td>
</tr>
<tr>
<td></td>
<td>Australian Shuffleboard Association (Qld)²</td>
<td>30 June 2024</td>
</tr>
<tr>
<td>Merv Craig Recreational Reserve, 254WD5361</td>
<td>Currumbin-Tugun Junior Rugby League Football Club²</td>
<td>30 June 2016</td>
</tr>
<tr>
<td>Schusters Park, 506RP174004</td>
<td>Gold Coast Horse and Carriage Club Inc.¹</td>
<td>30 June 2022</td>
</tr>
<tr>
<td>Relevant Reserve, lot and plan</td>
<td>Lease Holder</td>
<td>Lease Expiration Date</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>Elanora Wetlands Reserve, 2SP236797</td>
<td>H3GA Properties Pty Ltd (previously Lucent Technologies Australia Pty Ltd and Linday Pty Ltd) - Lease B on SP132535; lease numbers 704358082 and 704358086&lt;sup&gt;2&lt;/sup&gt;</td>
<td>31 May 2020</td>
</tr>
<tr>
<td></td>
<td>Queensland Environmental Protection Agency (DERM) – Lease A on SP120534, lease number 704496439&lt;sup&gt;2&lt;/sup&gt;</td>
<td>30 June 2016</td>
</tr>
<tr>
<td></td>
<td>Expressive Ground Community Arts Association Inc – Lease C on SP161665, lease number 706842077&lt;sup&gt;2&lt;/sup&gt;</td>
<td>30 June 2017</td>
</tr>
<tr>
<td></td>
<td>Vodafone Network Pty Ltd (Lease T on SP171304; lease numbers 708227314 and 708227316)&lt;sup&gt;2&lt;/sup&gt;</td>
<td>31 August 2014</td>
</tr>
</tbody>
</table>

<sup>1</sup>This lease area covers all or portions of the reserve area.
<sup>2</sup>This lease area is within the described lot but outside the reserve area.

The Gold Coast Horse and Carriage Club’s lease area is the only known lease area within the reserves and encompasses the remnant oxbow and adjacent areas at Schusters Park but does not include the ‘Rotary Park’ or ‘peninsula’ sections of the park. The use of this area does not appear to be currently impacting on the natural values of the oxbow section of Schusters Park reserve. However, if future restoration works are conducted in this area, it may be necessary to amend the lease area to exclude the oxbow and adjacent areas.

4.11.2 Desired outcomes

- Lease arrangements do not compromise conservation values of reserves.
- New or existing leases should provide for the appreciation and interpretation of the planning areas natural values and foster community support for conservation values.

4.11.3 Management strategy

4.11.3.1 Guidelines

**G11.1** Activities allowed on leased land are ecologically sustainable and for purposes consistent with sound conservation, social and recreational outcomes.

**G11.2** Where an existing lease has little or no nexus with conservation it should be phased out and moved to an alternative location.

**G11.3** Where a new lease or new lease use is proposed within the planning area, conduct an assessment of the potential environmental impacts of the proposal prior to granting approval. No activities or leases deemed to pose an unacceptable environmental impact are to be permitted within the planning area.

**G11.4** Review the conditions of leases such that they are made more ecologically sustainable and update as required six months prior to renewal.

**G11.5** Report all breaches of lease conditions to Council’s property management officers.

4.11.3.2 Actions

**A11.1** Monitor potential impacts of the Gold Coast Horse and Carriage Club’s use of the Schusters Park oxbow section and implement management actions to mitigate impacts as required.
A11.2 Develop and maintain a register of all leases and their renewal date.

A11.3 Review the appropriateness of all lease arrangements six months prior to renewal.

4.11.4 Key monitoring priorities

- Monitoring by Council’s natural areas officers to assess compliance by lessees with lease conditions.
- Impacts associated with use of conservation estate to be assessed and monitored in order to determine long term sustainability of designated use under lease agreement.

4.12 Commercial activities

4.12.1 Current management situation

When managed appropriately, commercial operators can enhance the diversity of recreational, interpretive and educational opportunities available for visitors and can assist reserve management through encouraging appropriate visitor use and understanding of reserve values.

Presently, there are no formally regulated commercial operators utilising the reserves.

GCCC Local Law 9, Section 14, outlines what sort of business can be operated in a GCCC Park. It states "A person (other than the local government) must not carry on business in a park or reserve unless - (a) the business is of a type specified in a subordinate local law; and (b) authorised by a permit." Subordinate Local Law 9.1 (S14) gives assessment criteria for a permitted business, and criterion (f) states "the permitted business will be operated on a temporary basis". Local Law 9, therefore does not allow for regulation of long term commercial use of parks.

The film industry represents another commercial activity that is periodically undertaken on Council reserves. Film project requirements may not always be consistent with the conservation objectives for the reserves outlined in this plan and film project proposals should be carefully assessed to ensure there are no negative impacts on the environmental values of the planning area.

Given the size of the reserves and limited access, future potential commercial activities, if any, are likely to be limited to ventures such as small-scale ecotourism (e.g. guided bushwalks or spotlighting tours) and possibly sporting events (e.g. parks used as a thoroughfare as part of the Anaconda adventure race event).

4.12.2 Desired outcomes

- Commercial tourism activities are conducted in a sustainable, safe, environmentally sensitive and culturally appropriate manner, and are compatible with other visitor uses.
- Cooperative working relationships with adjacent landholders to ensure long term sustainability of the ecological values of the planning area.

4.12.3 Management strategy

4.12.3.1 Guidelines

G12.1 Ensure that all access to reserves in the planning area is in accordance with Councils Parks Usage Policy – Temporary Commercial Recreation Activities on Council Land.
G12.2 Applications made for use of the planning area for filming will be assessed against the City of Gold Coast Guidelines for the Environmental Assessment of Film Productions in Conservation Reserves.

G12.3 Commercial activities within the planning area should be carried out by accredited ecotourism operators, providing sustainable, nature-based recreational opportunities.

G12.4 NAMU staff to be consulted as a stakeholder by Council’s regulatory services, economic development and law enforcement officers and DNPRSR regarding the development of commercial activities (i.e. tourism, corporate events, filming) in the planning area.

G12.5 Report instances of permit non-compliance to Council’s property management officers.

4.12.3.2 Actions

A12.1 Develop and implement a commercial usage policy to allow for the regulation of commercial users of natural areas (e.g. ecotours). The policy will need undergo public consultation and be endorsed by Council prior to implementation. Commercial activities in the planning area will be conducted in a manner that:

- is consistent with conservation of natural and cultural resources
- ensures the activities are nature based and provide appropriate interpretation of park values
- involves local Aboriginal input where there is a cultural heritage component
- avoids conflict with other reserve users
- does not incur high public liability risks
- is appropriate for the level of existing infrastructure or resources
- incorporates appropriate monitoring mechanisms to assess sustainability of ecological and amenity values.

A12.2 Develop and maintain a database of commercial operations within the planning area, including records of frequency, location, type/s and levels of use.

4.12.4 Key monitoring priorities

- Monitor the effects of commercial activities for signs of unacceptable levels of environmental impact.
- Monitor commercial activities for non-compliance with permit conditions.

4.13 Community involvement, education and interpretation

4.13.1 Current management situation

Protection of the environmental values of the planning area becomes easier to achieve if local residents and other visitors are aware of the environmental significance of the reserves and understand their management and conservation priorities. Providing information and environmental education can promote this awareness by helping to orientate visitors and enhance their visit. This in turn fosters an understanding and appreciation of the planning area’s features and values, encourages appropriate public use and behaviour, reduces potential management problems and contributes to a broader understanding of natural environments and management objectives.

Raising community awareness is highlighted as an important management strategy throughout this plan (Sections 4.1-4.8). Public education strategies proposed in this section
are aimed at increasing public awareness and understanding of management issues discussed above, including biodiversity and heritage protection, bushfire hazard management, threats posed by weeds and garden escapes and responsible pet ownership.

Schusters Park peninsula, Tarrabora Reserve and Beree-Badalla Reserve provide excellent opportunities for the development of user interpretation sites (refer to section 4.9.1.1). Nature interpretation signage is proposed for these areas to provide the public with information regarding these ecologically important coastal vegetation communities and Council’s recent restoration efforts.

Community groups and volunteers can contribute to natural area management through involvement in conservation and monitoring projects, public education, community development, and the promotion of Council’s conservation objectives. Council education initiatives currently occurring in the reserves include school children’s wildlife and restoration education programs and adult ecological workshops conducted under the NaturallyGC Program. The NaturallyGC Program is designed to educate people interested in exploring our unique and diverse Gold Coast environment, and is popular with the public.

Community groups have a long history of conservation work in the planning area. This includes Friends of Currumbin’s significant contribution to the establishment of Beree-Badalla Reserve. Community group involvement with ecological restoration work includes considerable efforts at Elanora Wetlands Reserve (Elanora Wetlands Bushcare Group), Tarrabora Reserve (Tarrabora Reserve Bushcare Group), Beree-Badalla Reserve (Friends of Currumbin) and Currumbin Ecovillage (Currumbin Creek Carers Group). Palm Beach and Tallebudgera Estuary Beach Care Groups and students at Tallebudgera Recreation Camp have also contributed to vegetation restoration along coastal foreshore areas. Gold Coast and Hinterland Environment Council have also provided considerable support and trainee development while undertaking restoration works at Schusters Park peninsula. Council recognises and appreciates the valuable support that these groups have provided in enhancing the natural values of the planning area.

A Good Neighbour Program is to be established for the Elanora-Palm Beach Reserves. This program will enable landholders adjacent to the reserves to contribute to the protection and management of the planning area by providing information to NAMU regarding wildlife, weed outbreaks, unauthorised access to reserves and other significant issues.

4.13.2 Desired outcomes

- Improved public appreciation and support for protection of scenic, recreational biodiversity and cultural values of the planning area.
- Improved visitor behaviour and greater public understanding of threats to scenic, recreational biodiversity and cultural values of the planning area.
- Where appropriate, community and visitor involvement in conservation and management of the planning area is encouraged.
- Good relationships are established with residents and landowners neighbouring the reserves of the planning area, and with community groups with an interest in the planning area.

4.13.3 Management strategy

4.13.3.1 Guidelines

G13.1 Continue to support community groups in the delivery of management plan objectives, in accordance with Council’s Restoration Action Plans, Beaches to Bushland Standard Operating Procedure and/or Council’s Integrated Volunteer Program.
G13.2 Manage educational use of the planning area according to permitted visitor uses (refer to Sections 4.9 and 4.12).

G13.3 Review and update interpretive material for the planning area on a regular basis to ensure currency and relevance of information.

4.13.3.2 Actions

A13.1 Prepare and implement an Interpretation Plan for the planning area. The primary aim of the plan is to ensure that all reserve and communication signage, activities and facilities are coordinated, of consistent quality and effectively communicate with visitors. The plan will include:

- objectives for reserve communication activities and priorities
- strategies for the development of information, interpretation, education and public relations products
- themes relating to the planning area’s values – for example, catchment values and management initiatives, flora and fauna (in particular threatened or otherwise significant species and communities), contribution to wildlife corridors, restoration activities and cultural heritage
- an overview of existing nature interpretation elements and those to be included in signage plans to be prepared for Schusters Park, Elanora Wetlands Eddie Kornhauser Recreational Reserve, Tarrabora Reserve, and Beree-Badalla Reserve (refer to section 4.9.3.2).

A13.2 Continue, and expand, school children, wildlife and restoration education and interpretive programs.

A13.3 Improve visitor behaviour, understanding and support of reserve management initiatives through increased Ranger patrols on weekends and holiday periods.

A13.4 Provide education and training to new and existing community bushcare and other volunteer groups about operating effectively with minimal Council supervision.

A13.5 Establish a Good Neighbour Program for the Elanora Reserves that allows the public to contribute to the protection and management of the planning area by providing information to NAMU regarding wildlife, weed outbreaks, unauthorised access to reserves and other significant issues.

4.13.4 Key monitoring priorities

- Assess the effectiveness of the Good Neighbour Program and other neighbour-based education initiatives.
- Monitor levels of community participation and satisfaction in conservation projects and their effectiveness in the planning area.

4.14 Research and monitoring

4.14.1 Current management situation

The purpose of undertaking scientific research and monitoring is to provide Council with a comprehensive understanding of the natural and cultural values, as well as ecological processes of the planning area. Furthermore, ongoing monitoring of management actions is necessary to establish whether such actions are effective and are achieving the desired conservation objectives.
It is considered essential that management of these highly important reserves be based on sound scientific information and continued monitoring of ecosystem condition. Experimental design and data collection methodologies should be consistent throughout all Council-managed natural areas. Research and monitoring of this nature will ensure that the ecological dynamics of the area are well understood, thereby enabling land managers to make informed decisions at both the reserve and landscape scale.

There is limited knowledge regarding the flora and fauna species that inhabit the planning area. Only Elanora Conservation Area has been comprehensively surveyed to assess flora, fauna and vegetation communities that occur in the area. The delivery of positive biodiversity conservation outcomes is dependent on enhanced knowledge and understanding of reserve values. Therefore, baseline surveys flora and fauna surveys are recommended for key reserves (e.g. Schusters Park, Tarrabora Reserve, Beree-Badalla Reserve, Currumbin Waters Park, Simpsons Road Reserve) to enhance knowledge of flora and fauna values and pest species should be the first priority within the planning area. Surveys should target areas that are representative of the variety of habitats and landforms that occur across planning area.

Monitoring the reserves to assess ecosystem condition and how well areas are maintaining biodiversity and habitat values is also a priority. Ecosystem condition monitoring methods will need to be efficient (yet effective) to maximise the number of areas that can be assessed. Data obtained from ecosystem condition monitoring will be used to inform management decisions regarding actions (e.g. fire management, weed control, restoration) that influence conditions in the reserves.

A number of existing institutions, management agencies and research groups have, or may have, an interest in ecological and threatened species research within or adjacent to the planning area, including: catchment management officers and environmental planning officers of Council, Griffith University Centre for Innovative Conservation Strategies, the Queensland Government, the NSW Department of Environment and Climate Change, Southeast Queensland Fire and Biodiversity Consortium, Southeast Queensland Catchments, Gold Coast Catchment Association, the Glossy Black Cockatoo Conservancy and the Richmond Birdwing Recovery Network. Some of these groups may be able to assist in identifying critical gaps in current knowledge and provide direction for research priorities.

There will be a continued need to monitor the impacts of recreational use on the reserves. Although current usage is generally low, population growth in the area has the potential to place increased pressure on the planning area.

The objective of this plan is to achieve sustainable management of the range of values associated with the planning area. Monitoring and evaluation will allow for the identification of developing management issues and will highlight changes in existing management practices necessary to ensure continued protection of ecological values. Furthermore, while research is important for guiding management, the areas involved can be sensitive and research itself may have an impact. It is important that research activities within the area are appropriately managed.

4.14.2 Desired outcomes

- Monitoring and research contributes to improved management of the planning area.
- Impacts of management are rapidly assessed through targeted monitoring.
- Management is adapted to effectively manage trends identified during monitoring.
- No unacceptable environmental impacts result from research and monitoring.
- Research is coordinated and integrated with strategic regional biodiversity management priorities.
4.14.3 Management strategy

4.14.3.1 Guidelines

G14.1 Undertake and support research and monitoring in the planning area which aims to:
- Increase knowledge of the reserve’s ecological values and conservation significance
- Understand the nature and rate of any change in these values
- Improve knowledge about visitor demand, satisfaction, use, characteristics and impacts
- Improve management practices for the natural and cultural resources
- Provide information that contributes to Council’s strategic planning functions
  contributes to the broader (e.g. regional, state, national etc) body of scientific knowledge

G14.2 Ensure that data collection and experimental design are scientifically rigorous and produce results that are able to be analysed statistically and consistent with Council’s Policy 8, Flora & Fauna Survey Methodology.

G14.3 All research within the planning area will be subject to a permit system. Permits will be issued in accordance with the provisions of Gold Coast City Council Local Law No. 9 (Parks and Reserves) and Local Law Policy No. 9.1 (Parks and Reserves). This means that researchers must book parks using the GCCC online park booking system (GCCC, 2011b).

G14.4 Researchers working in the planning area must liaise with NAMU regarding access, safety, compliance with management plan objectives and handover of research findings.

G14.5 Research activities involving the taking, use, or keeping of protected wildlife for scientific purposes must demonstrate sustainability and require a permit under the Nature Conservation (Wildlife) Regulation 2006.

G14.6 Where research and monitoring activities result in environmental disturbance or degradation within the reserve, researchers will be required to undertake rehabilitation of affected areas at the completion of the project/s and/or cease projects if the impact is deemed by Council’s natural areas management officers to be unacceptable.

G14.7 Adapt management practices to take into account threats, changes and opportunities identified in monitoring surveys/research studies.

G14.8 Collaborate with research institutions and other relevant organisations where opportunities exist to develop a strategic approach to addressing key management questions within the region.

G14.9 All proposed monitoring projects will be conducted based upon the availability of resources and funding. In order to ensure that those projects of the highest imperative are undertaken first, all monitoring initiatives will be prioritised within the Council’s Natural Areas Monitoring Projects Database.

G14.10 Forward all ecological data collected to environmental planning officers for incorporation into Council’s Flora & Fauna Database (www.goldcoastflorafauna.com.au).

4.14.3.2 Actions

A14.1 Develop and implement a monitoring strategy to assess the implementation and effectiveness of management strategies proposed in this management plan.
A14.2 Conduct regular monitoring (e.g. every 5 years) at key reserves and important habitat areas to assess changes in variables such as ecosystem condition, species richness, indicator species abundance and distribution, and the status of significant species (e.g. koala, glossy black cockatoo) populations.

A14.3 Regularly update Council’s Natural Areas Monitoring Projects Database when new monitoring and research projects for the planning area are identified. Priority topics include:

- updates to flora and fauna inventories
- monitoring of significant species and communities and further understanding of their management requirements
- monitoring of vegetation change and succession
- the role of wildlife corridors in the area
- monitoring of fauna populations and community interactions
- the most appropriate fire regimes for particular vegetation communities and individual plant and animal species
- monitoring of the planned burn program and its effects on fuel load accumulation
- monitoring the success of restoration programs within the planning area
- the impact of pest plants and/or animals on the ecology of the planning area
- cultural heritage research
- the acceptable limits of disturbance for different environments from recreational and management activities
- investigation of recreational demand within the context of the planning area and the entire city.

4.14.4 Key monitoring priorities

- Regular monitoring at key reserves and important habitat areas to assess changes in variables such as species richness, indicator species abundance and distribution, and the status of significant species (e.g. koala, glossy black cockatoo) populations.
- Monitor all research and monitoring programs to ensure that they do not result in unsustainable impacts upon the values of the planning area.
- Review on-ground management guidelines and actions against Desired Outcomes and Timelines at least every 5 years to assess the effectiveness of this Management Plan.

4.15 Consolidation of estate and management of isolated reserves

4.15.1 Current management situation

The domain designations for a number of lots associated in the planning area require reclassification to a designation congruent with their management as natural areas. It is recommended that lots within the planning area currently designated as Detached Dwelling Domain, Park Living Domain, Residential Choice Domain or Community Purposes Domain under the planning scheme (refer to section 3.1.2.1) be designated as Open Space Domain.

The western half of the peninsula in Schusters park (Lot 3 USL33135) is unallocated state land, owned by the State of Queensland. It is recommended that Council apply for trusteeship of this lot, as a Reserve for Environmental Purposes (under the Queensland Land Act), in order to maintain cohesive management for adjacent bushland and recreational assets.

Part of the land known by the local community as Elanora Wetlands (Lot 1 SP236797), which contains the Elanora Water Treatment Plant, was transferred to private water management authority ownership in 2010, then subsequently returned to Council ownership on July 2012. Restoration works at this site (by Elanora Wetlands Bushcare Group and Council
contractors) has been ongoing and a significant area has been restored. Gold Coast Water supports ongoing restoration works in the vegetated part of this site and proposed upgrades to the existing walking track network (refer to section 4.9.1.1). NAMU will continue to liaise with the incumbent water authority regarding asset ownership and management at this site.

Tarrabora Reserve (Lot 259 WD5078 and Lot 242 WD4471), for which Council is a trustee, currently has a reserve purpose of Park and Recreation under the Land Act 1994. It has long been a concern for the Palm Beach and Currumbin community that this designation does not afford adequate protection for the park’s significant environmental values, and further investigation of medium term and statutory protection mechanisms is required to identify mechanisms that will protect these values. However, the reserve is adjacent to one of Council’s flagship recreational parks (Palm Beach Parklands) and it is essential that any increased level of protection does not impact on Council’s future ability to enhance existing recreational infrastructure in the Palm Beach Parklands.

Relatively intact patches of remnant vegetation remain between Elanora Conservation Area and west of Simpsons Road Reserve. These areas provide core koala habitat and their presence is critical to the ongoing viability of the local koala population. Areas such as these that contain good quality vegetation should be considered for future acquisition due to their value for both local flora and fauna populations and their contribution to the Currumbin Corridor. Flora and fauna diversity and population viability is often directly proportional to habitat area and diversity. As such, acquisition of larger land parcels (i.e. greater than 50 hectares) that contain multiple vegetation types (particularly those not well represented across the reserve network), and provide ecological connectivity should be a priority.

4.15.2 Desired outcomes

- Ensure that the planning area’s values are adequately protected by appropriate land tenure and Domain or Local Area Plan designation within the Gold Coast Planning Scheme.
- The acquisition of strategically positioned allotments, or portions of allotments, is pursued to improve the functionality and connectivity of Council’s natural area estate in the planning area.

4.15.3 Management strategy

4.15.3.1 Guidelines

G15.1 Support the incorporation, acquisition or protection of lands adjacent to the planning area to improve the representation and connectivity of vegetation communities.

G15.2 NAMU to provide stakeholder input into the open space planning process to deliver natural area public open space that consolidates the existing reserve and ecological corridor network and is compatible with the management intent of the planning area.

4.15.3.2 Actions.

A15.1 Conservation planning officers to apply for transfer of all Council managed natural areas in the planning area from the Detached Dwelling Domain, Park Living Domain, Residential Choice Domain and (where practicable) Community Purposes Domain to the Public Open Space Domain (or suitable conservation domain/zone) during future revisions of Gold Coast Planning Scheme.

A15.2 Proceed with application, under the Queensland Land Act, for Council trusteeship of Lot 3 USL33135 as a Reserve for Environmental Purposes.
A15.3 Clarify asset management areas at Lot 1 SP236797 (Elanora Water Treatment Plant) and amend Council's mapping accordingly.

A15.4 Investigate mechanisms under the *Land Act 1994* and *Vegetation Management Act 1999* that would enable increased protection of environmental values at Tarrabora Reserve, whilst maintaining Council's ability to develop future recreational infrastructure at Palm Beach Parklands.

4.15.4 Key monitoring priorities

- Periodic assessments to ensure that all new Council managed natural areas are designated within either the Public Open Space Domain or a similar conservation-based designation.
- Review new potential natural area acquisitions to assess whether their position in the landscape contributes to the functionality and connectivity of Council's natural area estate.

4.16 Coordinated reserve management

4.16.1 Current management situation

Tallebudgera Creek Conservation Park, managed by the Queensland Government Department of National Parks, Recreation, Sport and Racing, is located along the banks of Tallebudgera Creek, downstream from the Pacific Motorway-Tallebudgera Creek bridge. Developing and maintaining a cooperative relationship with the Queensland Government will contribute to consistent management of State and Council protected areas. This cooperation is important given the proximity of Schusters Park to the Tallebudgera Creek Conservation Area and tidal conditions present in this section of the creek. For example, coordinated weed control efforts could reduce the capacity for weed species to be dispersed between the sites.

A number of private lots adjacent to conservation reserves provide connectivity between the reserves and are strategically important in maintaining a viable conservation network. Within the planning area owners of nine private properties in the management cluster are currently participating in Council’s Land for Wildlife program. No Voluntary Conservation Agreements (VCAs) have been established for areas in the management cluster. However, there is considerable potential for establishing VCAs in the area to secure the viability of areas of higher ecological value.

4.16.2 Desired outcomes

- Integrated and collaborative management between Council, Queensland Government and neighbours.
- Effective and efficient use of Council’s resources in managing priority reserves within the planning area.

4.16.3 Management strategy

4.16.3.1 Guidelines

G16.1 Facilitate an integrated landscape-scale management approach for issues such as fire hazard risk, catchment management, pest control, access, recreation and threatened species management, through collaboration with adjacent landowners and land managers.

G16.2 Ensure that Council’s natural areas management officers are a key stakeholder in strategic land use planning in the area. A natural areas management officer is to be
consulted regarding development applications on properties adjacent to conservation reserves.

G16.3 NAMU officers to provide advice and support where required to owners of local Land for Wildlife properties.

4.16.4 Key monitoring priorities

- Review of the success of collaborative management programs to determine whether outcomes have been achieved and to provide feedback for the improvement of future programs.

4.17 Naming of reserves within the planning area

4.17.1 Current management situation

Parks within the planning area have been named in accordance with Council’s Naming of Parks and Community Facilities Policy (GCCC 2007b). Council adopts a general practice of naming parks and facilities after their street, suburb or a nearby geographical feature so parks are readily identifiable to Council staff, emergency services and the public. Applications to name or rename parks and community facilities after individuals, families, service clubs or community organisations may be suitable in some circumstances and must be assessed against the criteria outlined in Attachment A of the policy.

The Naming of Parks and Community Facilities Policy includes a general principle relevant to lands bought with the OSPL, and requires that such sites are named at the time of the preparation of the management plan. The policy states that these acquisitions must be given a name which describes the general location and key natural values for which the area was purchased, followed by the term ‘Conservation Area’. The policy also acknowledges the importance of identifying any cultural and natural heritage, indicating that it is appropriate to name interpretive or recreational infrastructure after historical affiliations or individual families who have made a contribution to the city or locality. OSPL acquired reserves in the planning area named according to this policy are: Elanora Conservation Area and Simpsons Road Conservation Area.

One small alteration to a park name will be made in response to public feedback that was received when the Draft Elanora Palm Beach Conservation Reserves Management Plan was placed on public display. Rockview Public Park, as shown in Figure 1 will be divided in two sections. The northern section of the park will remain known as Rockview Public Park. The southern section of this park, adjacent to Palm Beach Parklands will now be given a new and different name. A name for this area will be decided in due course, in consultation with the Divisional Councillor.

4.17.2 Desired outcomes

- The names of all OSPL acquisitions within the planning area are formalised.
- Reserve nomenclature is consistent within the planning area and identifies geographic location or cultural history, and management intent for the reserves.

4.17.3 Management strategy

4.17.3.1 Guidelines

G17.1 Ensure that naming or renaming of reserves within the planning area is carried out in accordance with Council’s Naming of Parks and Community Facilities Policy.
**G17.2** Ensure that the naming of all reserves within the planning area adequately reflects their conservation status and general management intent.

**G17.3** All future signage and communication materials should reflect reserve names adopted in this management plan.

### 4.17.3.1 Actions

**A17.1** The northern section of Lot 258WD5078 will remain known as Rockview Public Park. The southern section of this park, adjacent to Palm Beach Parklands will now be given a new and different name. A name for this area will be decided in due course, in consultation with the Divisional Councillor.

### 4.17.4 Key monitoring priorities

- Undertake periodic assessments ensure that all new natural area public open space within the planning area is named in accordance with the *Naming of Parks and Community Facilities Policy*. 
5 Summary of management priorities and timeframes

Table 10 provides a prioritised list of all management actions given in Section 4 of this plan, for incorporation into strategic and operational works programs for the Natural Areas Management Unit. Management actions are listed reserve by reserve (where relevant) to facilitate easy identification of priority actions for each reserve within the planning area. Actions that apply to the entire planning area are listed first.

Priorities have been assigned by the Natural Areas Management Unit planning team, on the basis of professional experience, knowledge of the planning area and feedback received from stakeholders consulted during the management planning process. Priorities have been assigned at the management cluster (planning area) level and may not reflect city-wide priorities. Following adoption of this plan, all management actions are input into the NAMU Operational Framework Plan, which is a city-wide database of conservation reserve management actions, used to determine NAMU work programs. In this database priorities and timeframes for all conservation management plan actions are assigned in accordance with Council’s conservation estate reserve classification system (Ecosure 2011), priority determined in the management plan, resource availability, likelihood of success and political imperative.

High priority actions given below are those imperative to achievement of the management objectives and desired outcomes given in sections 3 and 4. It is expected that they will be achieved within five years of the approval of this plan in order to avoid significant deterioration in natural, cultural or management resources. Medium priority actions are those that are necessary to achieve management objectives and desired outcomes but are less urgent. They should be completed within the lifetime of the plan (i.e. 10 years). Low priority actions are desirable to achieve management objectives and should be implemented within the lifetime of the plan, but will be contingent upon the availability of resources.

Table 10. Management action priorities for Elanora-Palm Beach Conservation Reserves

<table>
<thead>
<tr>
<th>Theme</th>
<th>Action number</th>
<th>Action</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landscape protection</td>
<td>A1.1</td>
<td>Undertake periodic site visits to monitor illegal vegetation clearing and other encroachment activities adjacent to the reserves. Report new encroachments to the coordinator of the Natural Areas Management Unit for appropriate action.</td>
<td>High</td>
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<tr>
<td></td>
<td>A1.3</td>
<td>Where identified, close and rehabilitate informal walking and mountain bike tracks that do not form part of the strategic recreational tracks network for the planning area (refer to Section 4.10).</td>
<td>High</td>
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<tr>
<td></td>
<td>A1.4</td>
<td>Council’s environmental planning officers to implement priority recommendations of the Currumbin corridor study (Chenoweth 2010).</td>
<td>Medium</td>
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<td></td>
<td>A1.5</td>
<td>Through ranger patrols, encourage neighbouring residents to protect and retain native vegetation in and adjoining the planning area.</td>
<td>High</td>
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<td></td>
<td>A1.6</td>
<td>Council’s environmental planning officers to promote private landholder vegetation conservation incentives to residents – particularly those in higher risk slope instability areas neighbouring the reserves.</td>
<td>Medium</td>
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<tr>
<td>Catchment management</td>
<td>A2.3</td>
<td>Assess the condition (and use level) of formal and informal tracks and stream-side areas in reserves that are used to access waterways; repair/formalise access tracks and areas where necessary to reduce damage to riparian communities.</td>
<td>Medium</td>
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<tr>
<td>Native flora</td>
<td>A3.1</td>
<td>Conservation officers to conduct baseline flora surveys of key reserves (such as Schusters Park peninsula, Tarrabora Reserve, Beree-Badalla Reserve, Currumbin Waters Park, Simpsons Road Reserve). Surveys should target areas that are representative of the variety of vegetation communities, habitats and landforms that occur across planning area.</td>
<td>Medium</td>
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<tr>
<td>Theme</td>
<td>Action number</td>
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<td>Priority</td>
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<tr>
<td>Native fauna</td>
<td>A3.2</td>
<td>Natural Areas officers to note (during routine field work) possible maintenance requirements where native vegetation in the reserves is encroaching on neighbouring properties.</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>A4.1</td>
<td>Conduct baseline fauna surveys of key reserves (e.g. Schusters Park, Simpsons Road Reserve, Merv Craig Recreational Park, Tarrollaba Reserve, Currumbin Waters Park). Surveys should target areas that are representative of the variety of habitats and landforms that occur across planning area.</td>
<td>Medium</td>
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<tr>
<td></td>
<td>A4.2</td>
<td>Support and assist in implementation of koala management strategies recommended in the Koala Conservation Plan for Elanora-Currumbin Waters.</td>
<td>High</td>
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<td></td>
<td>A4.3</td>
<td>Actively seek for Council to implement traffic calming measures (eg. koala road crossing signs, reduced speed limits to 50 kph) for Simpsons Road south of Guineas Creek Road and Tallebudgera Connection Road.</td>
<td>Medium</td>
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<td></td>
<td>A4.4</td>
<td>Implement management measures (e.g. closure of informal and unnecessary tracks, planted buffers and signage) to deter inappropriate access to areas containing known populations of rare and threatened species.</td>
<td>High</td>
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<tr>
<td></td>
<td>A4.5</td>
<td>Provide advice to Wildcare Australia for their establishment of a koala food tree plantation.</td>
<td>Low</td>
</tr>
<tr>
<td>Bushfire</td>
<td>A5.1</td>
<td>Implement the Elanora Conservation Reserves Bushfire Management Plan (AECOM 2009), including establishment of relevant management zones to provide for the protection of life, property and natural and cultural values, maintenance of fire management infrastructure and delivery of hazard reduction burns in accordance with city-wide burn priorities.</td>
<td>High</td>
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<tr>
<td></td>
<td>A5.2</td>
<td>Review the Elanora Conservation Reserves Bushfire Management Plan every ten years, in consultation with relevant stakeholders. Confine these reviews to amendments associated with:</td>
<td>Medium</td>
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<td>• pertinent new research findings and information</td>
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<td>• the results of monitoring programs, where they indicate the need for changes in management</td>
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<td>• the need for water tanks in the planning area</td>
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<td>• existing management strategies that are not achieving stated objectives</td>
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<td>A5.3</td>
<td>Develop and maintain GIS mapping layers to inform effective fire planning, including:</td>
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<td>• basic topographic attributes</td>
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<td>• vegetation communities, including information on age classes</td>
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<td>• threatened and significant plant species and communities</td>
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<td>• the habitats of rare and threatened native animal species</td>
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<td>• fire histories, including ignition sources and fire path information</td>
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<td>• fuel load attributes</td>
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<td>• management trails and fire breaks</td>
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<td>• water points</td>
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<td>• built infrastructure and assets</td>
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<td>A5.5</td>
<td>Facilitate community education to inform priority neighbouring residents of the need to maintain their properties to reduce fire hazard.</td>
<td>High</td>
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<td></td>
<td>A5.6</td>
<td>Provide Incident Management Team support at wildfire events to facilitate the protection of life, property and the environment.</td>
<td>High</td>
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<td>A5.7</td>
<td>Undertake fuel hazard monitoring prior to and following all prescribed burns, and conduct similar monitoring following wildfires where time and resources permit.</td>
<td>High</td>
</tr>
<tr>
<td>Pest plants and ecological restoration</td>
<td>A6.1</td>
<td>Continue with current ecological restoration works at Schusters Park, Tarrollaba Reserve, Beree-Badalla Reserve, Merv Craig Recreational Park, Eddie Kormhauser Recreational Reserve, Simpsons Road Conservation Area and Elanora Conservation Area ensuring that adequate resources are provided for follow-up management. Routine maintenance should be conducted in association with all restoration activities undertaken within the planning area.</td>
<td>High</td>
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<tr>
<td></td>
<td>A6.2</td>
<td>Forest Drive Reserve, Kimmulu Parklands, Calcita Avenue Reserve, Wyara Park, Currumbin Waters Park, Schusters Park (oxbow lake and areas adjacent to upstream section of Tallebudgera Creek) and Simpsons Road Reserve have been identified as possible high priority restoration sites. Undertake further assessment of restoration priorities for these and other sites with consideration of the</td>
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<td>Theme</td>
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<td>following (and other) factors:</td>
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<td>• these reserves are in the Currumbin Corridor (critical corridor under the NCS)</td>
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<td>• type and extents of weed infestations in the reserves</td>
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<td>• availability of access to affected areas</td>
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<td>• resilience of affected vegetation</td>
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<td>• topography of areas</td>
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<td>• restoration priorities identified in Catchment Management Plans, including unstable creek banks and riparian corridors.</td>
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<td>A6.3</td>
<td>Prepare Restoration Plans/Action Plans for high priority reserves (as identified by Action A6.2 above). These plans will determine operational requirements and priorities for restoration and weed management activities with the primary aim of restoring degraded areas and enhancing ecological values.</td>
<td>High</td>
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<tr>
<td></td>
<td>A6.5</td>
<td>Council’s natural areas management officers to conduct monitoring for declared plants and high priority environmental weeds at reserves where existing infestations are present, or there is a high risk for new infestations to occur.</td>
<td>Medium</td>
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<td></td>
<td>A6.6</td>
<td>Regularly update the Natural Areas Restoration Database with weed species observed and treated during site restoration, area covered, methodology and hours worked.</td>
<td>Low</td>
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<td>A6.7</td>
<td>Incorporate field observations of declared pest plants into the NAMU incidental records database, the GCCC flora and fauna records database and notify Council’s pest management officers of new infestations of Class 1 and 2 declared plants (within 24 hours and 7 days respectively) to enable better integration of control and monitoring activities.</td>
<td>Medium</td>
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<td>A6.8</td>
<td>Following prescribed burns, and where possible wildfires, assess the re-colonisation of weeds and carry out follow-up weed control.</td>
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<td>A6.9</td>
<td>Participate in the development and implementation of coordinated regional pest plant control initiatives with neighbours, community groups, and other land management agencies, including Biosecurity Queensland. Where feasible, pursue partnerships with DNPRSR, the Department of Agriculture, Fisheries and Forestry (DAFF) and other local councils to facilitate collaborative pest plant management between Council and State managed reserves, particularly where pest plant species from State managed sites occur upslope/upstream of sites recently restored by Council.</td>
<td>Medium</td>
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<tr>
<td></td>
<td>A6.10</td>
<td>Where additional resourcing is required to undertake restoration within natural area developer-contributed public open space, investigate the feasibility of Council’s natural areas restoration teams conducting works in these areas.</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>A6.11</td>
<td>Continue working with and supporting the Bushcare groups that work in the management area.</td>
<td>High</td>
</tr>
<tr>
<td>Pest animals</td>
<td>A7.1</td>
<td>Establish baseline data on pest impacts to inform ongoing pest management programs.</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>A7.2</td>
<td>Provide incidental records relating to pest animal sightings, movement routes, dens, trap sites and bait locations to Council’s animal management officers.</td>
<td>High</td>
</tr>
<tr>
<td>Aboriginal and European Heritage</td>
<td>A8.1</td>
<td>In consultation with the local Aboriginal community, provide interpretation/educational infrastructure and/or material to promote public appreciation and understanding of aboriginal sites, landscape features and heritage values within the planning area.</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>A8.2</td>
<td>In consultation with Council’s heritage officers, provide interpretation/educational material where appropriate to foster public appreciation and understanding of local heritage values.</td>
<td>Medium</td>
</tr>
<tr>
<td>Recreation opportunities</td>
<td>A9.1</td>
<td>In consultation with Gold Coast Parks, implement a recreational demand study to identify the future need for additional nature-based recreational facilities within the planning area, incorporating monitoring data for existing recreational uses at or near the planning area. Where demand is identified, undertake a feasibility assessment to identify suitable locations within the planning area or opportunities on adjacent private properties.</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>A9.8</td>
<td>Provide information (including downloadable maps) on Council’s website relating to key recreational opportunities within the planning area, including:</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Adding Schusters Park, Tarrabora Reserve and Beree-Badalla Reserve to the ‘Exploring nature’ category of the Gold Coast Parks - park finder internet search tool,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Adding reserves containing good bushwalking tracks (including Schusters Park) to the Gold Coast Parks ‘Bushwalking’</td>
<td></td>
</tr>
<tr>
<td>Theme</td>
<td>Action number</td>
<td>Action</td>
<td>Priority</td>
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</tr>
<tr>
<td>Built Infrastructure and Access</td>
<td>A9.9</td>
<td>Undertake regular weekday and weekend ranger patrols of the planning area to monitor visitor safety and usage along formal and informal recreation tracks, to encourage safe and appropriate use by visitors, and to control prohibited activities.</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>A9.10</td>
<td>Commission regular arboricultural assessments where potentially hazardous trees are identified within the vicinity of visitor infrastructure. Prune or, where no alternative exists, remove trees which have been identified as posing an unacceptable safety risk.</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>A9.11</td>
<td>Maintain records of safety incidents, hazards and inappropriate use observed during ranger patrols or by the public, to inform future planning and risk management.</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>A10.1</td>
<td>As a minimum, install naming and regulatory signage at all formal and publicly used entrances to reserves, including signage to indicate OSPL acquired reserves; replace damaged or derelict signs and gates, as required.</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>A10.2</td>
<td>Review access and infrastructure layers (signs, gates, management tracks etcetera) on Council’s GIS database and advise spatial information officers of required updates.</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>A10.4</td>
<td>Remove or dispose of existing derelict infrastructure (e.g. damaged fences, wire, old timber, rubbish piles, cubby houses) in reserves, where not identified as being of significant cultural value. Rehabilitate cleared sites in accordance with the provisions of relevant restoration plans (Section 4.6), where not required for recreation or management purposes.</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>A10.5</td>
<td>Regularly monitor the condition of boundary fencing to ensure it remains effective as a barrier to unauthorised access and repair as required (in consultation with neighbours where necessary).</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>A10.6</td>
<td>Where required, install fauna-friendly (e.g. barbless wire), stock-proof fencing along the boundary of the reserves of the planning area to facilitate the unimpeded movement of native fauna species. This may necessitate the modification of existing fencing to provide fauna movement capabilities.</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>A10.7</td>
<td>All built infrastructure retained and installed within the planning area is to be placed on a regular maintenance roster involving provision for scheduled and reactive maintenance inspections and activities, as required.</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>A10.13</td>
<td>Monitor management tracks to ensure that they are safe and that drainage is functioning effectively; undertake repairs where necessary to avoid ponding of water, erosion and unsafe conditions.</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>A10.14</td>
<td>Close and rehabilitate roads and tracks not required for public and management vehicle access.</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>A10.15</td>
<td>Assess width of existing access tracks against bushfire response access requirements and rehabilitate where track width exceed requirements, to minimise extent of disturbed areas.</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>A10.16</td>
<td>Monitor unauthorised access to reserves and, where necessary, install bollards, signage or other vehicle exclusion devices at entry points of publicly accessible environmentally sensitive areas to restrict vehicular incursion. Ensure these structures are constructed of sustainable materials and are commensurate with the natural landscape.</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>A10.17</td>
<td>Natural areas operations officers to report illegal vehicle access, including trail bike and four-wheel drive access to Council’s law enforcement officers.</td>
<td>High</td>
</tr>
<tr>
<td>Leased areas</td>
<td>A11.2</td>
<td>Develop and maintain a register of all leases and their renewal date.</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>A11.3</td>
<td>Review the appropriateness of all lease arrangements six months prior to renewal.</td>
<td>Medium</td>
</tr>
<tr>
<td>Commercial activities</td>
<td>A12.1</td>
<td>Develop and implement a commercial usage policy to allow for the regulation of commercial users of natural areas (e.g. ecotours). The policy will need undergo public consultation and be endorsed by Council prior to implementation. Commercial activities in the planning area will be conducted in a manner that: • is consistent with conservation of natural and cultural resources • ensures the activities are nature based and provide appropriate interpretation of park values • involves local Aboriginal input where there is a cultural heritage component • avoids conflict with other reserve users</td>
<td>High</td>
</tr>
<tr>
<td>THEME</td>
<td>ACTION</td>
<td>DESCRIPTION</td>
<td></td>
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</tr>
<tr>
<td>Community involvement, education and interpretation</td>
<td>A12.2</td>
<td>Develop and maintain a database of commercial operations within the planning area, including records of frequency, location, type/s and levels of use.</td>
<td></td>
</tr>
</tbody>
</table>
| | A13.1 | Prepare and implement an Interpretation Plan for the planning area. The primary aim of the plan is to ensure that all reserve and communication signage, activities and facilities are coordinated, of consistent quality and effectively communicate with visitors. The plan will include:  
  - objectives for reserve communication activities and priorities  
  - strategies for the development of information, interpretation, education and public relations products  
  - themes relating to the planning area’s values – for example, catchment values and management initiatives, flora and fauna (in particular threatened or otherwise significant species and communities), contribution to wildlife corridors, restoration activities and cultural heritage  
  - an overview of existing nature interpretation elements and those to be included in signage plans to be prepared for Schusters Park, Elanora Wetlands Eddie Kornhauser Recreational Reserve, Tarrabora Reserve, and Beree-Badalla Reserve (refer to section 4.9.3.2). |
| | A13.2 | Continue, and expand, school children, wildlife and restoration education and interpretive programs. |
| | A13.3 | Improve visitor behaviour, understanding and support of reserve management initiatives through increased Ranger patrols on weekends and holiday periods. |
| | A13.4 | Provide education and training to new and existing community bushcare and other volunteer groups about operating effectively with minimal Council supervision. |
| | A13.5 | Establish a Good Neighbour Program for the Elanora-Palm Beach Reserves that allows the public to contribute to the protection and management of the planning area by providing information to NAMU regarding wildlife, weed outbreaks, unauthorised access to reserves and other significant issues. |
| Research and monitoring | A14.1 | Develop and implement a monitoring strategy to assess the implementation and effectiveness of management strategies proposed in this management plan. |
| | A14.2 | Conduct regular monitoring (e.g. every 5 years) at key reserves and important habitat areas to assess changes in variables such as ecosystem condition, species richness, indicator species abundance and distribution, and the status of significant species (e.g. koala, glossy black cockatoo) populations. |
| | A14.3 | Regularly update Council’s Natural Areas Monitoring Projects Database when new monitoring and research projects for the planning area are identified. Priority topics include:  
  - updates to flora and fauna inventories  
  - monitoring of significant species and communities and further understanding of their management requirements  
  - monitoring of vegetation change and succession  
  - the role of wildlife corridors in the area  
  - monitoring of fauna populations and community interactions  
  - the most appropriate fire regimes for particular vegetation communities and individual plant and animal species  
  - monitoring of the planned burn program and its effects on fuel load accumulation  
  - monitoring the success of restoration programs within the planning area  
  - the impact of pest plants and/or animals on the ecology of the planning area  
  - cultural heritage research  
  - the acceptable limits of disturbance for different environments from recreational and management activities  
  - investigation of recreational demand within the context of the planning area and the entire city. |
<table>
<thead>
<tr>
<th>Theme</th>
<th>Action number</th>
<th>Action</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consolidation of estate and management of isolated reserves</td>
<td>A15.1</td>
<td>Conservation planning officers to apply for transfer of all Council managed natural areas in the planning area from the Detached Dwelling Domain, Park Living Domain, Residential Choice Domain and (where practicable) Community Purposes Domain to the Public Open Space Domain (or suitable conservation domain/zone) during the future revisions of Gold Coast Planning Scheme.</td>
<td>High</td>
</tr>
<tr>
<td>Naming of reserves within the planning area</td>
<td>A17.1</td>
<td>The northern section of Lot 258WD5078 will remain known as Rockview Public Park. The southern section of this park, adjacent to Palm Beach Parklands will now be given a new and different name. A name for this area will be decided in due course, in consultation with the Divisional Councillor.</td>
<td>Low</td>
</tr>
<tr>
<td>Avocado Park</td>
<td>A10.12</td>
<td>Formalise the western boundary track at Avocado Park and install treads (stone-like steps) (treads section estimated to be 200 to 300 m in length) to improve user safety.</td>
<td>Medium</td>
</tr>
<tr>
<td>Beree-Badalla Reserve</td>
<td>A6.4</td>
<td>Establish a mangrove education and restoration project to reduce the impacts of Palm Beach-Currumbin State High School on Beree Badalla Reserve. Beree Badalla Reserve is in the Currumbin Creek Fish Habitat Area (FHA), hence restoration will need to comply with sections 6.2.1 Restoring the fish habitat or natural processes and/or 6.2.2 Managing fisheries resources or fish habitat of Fisheries Queensland policy Management of declared Fish Habitat Areas FHMOP 002. The project restoration action plan will need to be endorsed by DAFF prior to initiation of works.</td>
<td>High</td>
</tr>
<tr>
<td>Recreation opportunities</td>
<td>A9.3</td>
<td>Prepare and implement signage plans for Beree-Badalla Reserve in accordance with the planning area Interpretation Plan (refer to Section 4.13.3.2), to provide information regarding:</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- restoration works,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- nature interpretation (see Section 4.13 for topics),</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- indigenous cultural heritage and historic use (in consultation with relevant indigenous groups),</td>
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<tr>
<td></td>
<td></td>
<td>- impacts of detrimental activities including, littering, dumping green waste, tree clearing and unauthorised vehicle or domestic animal access.</td>
<td></td>
</tr>
<tr>
<td>Built Infrastructure and Access</td>
<td>A10.11</td>
<td>Formalise Beree-Badalla Reserve track used by Palm Beach-Currumbin State High School for kayak access to Currumbin Creek.</td>
<td>High</td>
</tr>
<tr>
<td>Recreation opportunities</td>
<td>A9.3</td>
<td>Prepare and implement signage plans for Eddie Kornhauser Recreational Reserve, in accordance with the planning area Interpretation Plan (refer to Section 4.13.3.2), to provide information regarding:</td>
<td>Medium</td>
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<tr>
<td></td>
<td></td>
<td>- restoration works,</td>
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<tr>
<td></td>
<td></td>
<td>- nature interpretation (see Section 4.13 for topics),</td>
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<tr>
<td></td>
<td></td>
<td>- indigenous cultural heritage and historic use (in consultation with relevant indigenous groups),</td>
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<tr>
<td></td>
<td></td>
<td>- impacts of detrimental activities including, littering, dumping green waste, tree clearing and unauthorised vehicle or domestic animal access.</td>
<td></td>
</tr>
<tr>
<td>Elanora Conservation Area</td>
<td>A1.2</td>
<td>Upgrade the Elanora Conservation Area management track to improve track stability and reduce erosion.</td>
<td>High</td>
</tr>
<tr>
<td>Elanora Oval</td>
<td>A9.5</td>
<td>In consultation with Gold Coast Parks, investigate the feasibility of establishing a mountain bike/BMX skills track at Elanora Oval.</td>
<td>Low</td>
</tr>
<tr>
<td>Theme</td>
<td>Action number</td>
<td>Action</td>
<td>Priority</td>
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</tbody>
</table>
| Elanora Wetlands Reserve | Recreation opportunities | A9.2 | Prepare and implement a Signage Plan for Elanora Wetlands, in accordance with the planning area Interpretation Plan (refer to Section 4.13.3.2), to include/address the following:  
- exclusion of dogs and motorbikes from the peninsula section (with reference to existing signage at parking areas that indicate where dogs are allowed)  
- permitted areas for horse riding in Schusters Park  
- responsible pet ownership practices for reducing impacts on wildlife  
- nature interpretation (see Section 4.13 for topics) and restoration area signage to be installed along peninsula trail and in Elanora Wetlands  
- Signage on Tallbudgera Creek Road (approximately 100 m east of Heather Street) to inform drivers travelling west of entrance via Heather Street.  
- as per Action 7.3, Parks Gold Coast to replace faded maps showing dog and horse exercise zones in Schusters Park at Heather Street car park and picnic area, and install additional maps at Nineteenth Avenue and peninsula access points | Medium |
| | Community involvement, education and interpretation | A15.3 | Clarify asset management areas at Lot 1 SP236797 (Elanora Water Treatment Plant) and amend Council’s mapping accordingly. | High |
| Schusters Park | Catchment management | A2.1 | Natural areas management and catchment management officers to implement works (regrade drain and install a larger culvert) to mitigate pooling of stagnant water in drain connecting Schusters Park oxbow with Tallbudgera Creek. | High |
| | | A2.2 | Catchment management and NAMU officers to further investigate high priority restoration sites in Schusters Park that were identified in the Tallbudgera Creek CMP. | Medium |
| | Pest animals | A7.3 | Parks Gold Coast to replace Schusters Park dog exercise and horse riding zoning maps at Heather Street car park and picnic area, and install additional signs at Nineteenth Avenue and peninsula access points. | Medium |
| | | A7.4 | Council’s animal management officers to conduct periodic patrols at Schusters Park to monitor dog exclusion/on-lead regulations. | Medium |
| | Recreation opportunities | A9.2 | Prepare and implement a Signage Plan for Schusters Park and Elanora Wetlands, in accordance with the planning area Interpretation Plan (refer to Section 4.13.3.2), to include/address the following:  
- location and functionality of existing signage  
- replacement of zoning maps to clarify permitted dog walking and horse riding areas  
- responsible pet ownership practices for reducing impacts on wildlife  
- nature interpretation (see Section 4.13 for topics) and restoration area signage to be installed along peninsula trail and in Elanora Wetlands  
- Gold Coast Parks to install a sign on Tallbudgera Creek Road (approximately 100 m east of Heather Street) to inform drivers travelling west of entrance via Heather Street.  
- as per Action 7.3, Parks Gold Coast to replace faded maps showing dog and horse exercise zones in Schusters Park at Heather Street car park and picnic area, and install additional maps at Nineteenth Avenue and peninsula access points | Medium |
<p>| | | A9.4 | Investigate the potential impacts (and feasibility) of the proposed link from Schusters Park to Burleigh. The possible impacts of a pedestrian footbridge over Tallebudgera Creek (at Schusters Park) and the installation of a walking track and boardwalk through the Elanora Wetlands area require further assessment. | Low |
| | | A9.6 | Council’s engineering assets and planning officers (in conjunction with DTMR) to investigate the feasibility of establishing a new kayak landing/launching point at the old Tallebudgera Connection Road – Tallbudgera Creek timber bridge crossing. It may be possible to establish a new launching/landing point under the PIP program. | Low |
| Built Infrastructure and Access | A10.3 | Remove old shelter shed in Schusters Park peninsula and rehabilitate surrounding area. | High |
| | | A10.8 | Install a gate, fencing and horse step-over at the entrance to the Schusters Park peninsula section to restrict vehicle and motorbike access. | Medium |</p>
<table>
<thead>
<tr>
<th>Theme</th>
<th>Action number</th>
<th>Action</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A10.9</td>
<td>Upgrade track along the eastern edge of Schusters Park peninsula to improve drainage and maintain a suitable condition for pedestrian and rider access.</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>A10.10</td>
<td>Close and rehabilitate informal tracks in Schusters Park peninsula where damage to vegetation is occurring and amend access signage accordingly.</td>
<td>High</td>
</tr>
<tr>
<td>Leased areas</td>
<td>A11.1</td>
<td>Monitor potential impacts of the Gold Coast Horse and Carriage Club’s use of the Schusters Park oxbow section and implement management actions to mitigate impacts as required.</td>
<td>Medium</td>
</tr>
<tr>
<td>Community involvement, education and interpretation</td>
<td>A15.2</td>
<td>Proceed with application, under the Queensland Land Act, for Council trusteeship of Lot 3 USL33135 as a Reserve for Environmental Purposes.</td>
<td>Low</td>
</tr>
<tr>
<td>Simpsons Road Reserve</td>
<td>Bushfire</td>
<td>A5.4</td>
<td>Construct a cul-de-sac at the end of Westminster Boulevard. This infrastructure will provide improved emergency services response for the Elanora Conservation Area and adjacent residences and minimise impacts from heavy vehicle turnaround (eg garbage trucks).</td>
</tr>
<tr>
<td>Tarrabora Reserve</td>
<td>Pest animals</td>
<td>A7.4</td>
<td>Council’s animal management officers to conduct periodic patrols at Tarrabora Reserve to monitor dog exclusion/on-lead regulations.</td>
</tr>
<tr>
<td>Recreation opportunities</td>
<td>A9.3</td>
<td>Prepare and implement signage plans for Tarrabora Reserve, Beree-Badalla Reserve and Eddie Komhauers Recreational Reserve, in accordance with the planning area Interpretation Plan (refer to Section 4.13.3.2), to provide information regarding:</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• restoration works,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• nature interpretation (see Section 4.13 for topics),</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>• indigenous cultural heritage and historic use (in consultation with relevant indigenous groups),</td>
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<tr>
<td></td>
<td></td>
<td>• impacts of detrimental activities including, littering, dumping green waste, tree clearing and unauthorised vehicle or domestic animal access.</td>
<td></td>
</tr>
<tr>
<td>Consolidation of estate and management of isolated reserves</td>
<td>A15.4</td>
<td>Investigate mechanisms under the Land Act 1994 and Vegetation Management Act 1999 that would enable increased protection of environmental values at Tarrabora Reserve, whilst maintaining Council’s ability to develop future recreational infrastructure at Palm Beach Parklands.</td>
<td>High</td>
</tr>
</tbody>
</table>
6 References


Gold Coast City Council. 2004b. *Our Natural Playground: A parks and recreation plan for the Gold Coast*. GCCC, Gold Coast.


Gold Coast City Council. 2010a. Gold Coast City flora and fauna database. Environment, Planning and Conservation Unit.

Gold Coast City Council. 2010. *About our Living City – Gold Coast Planning Scheme ver 1.2*. GCCC, Gold Coast.


Healthy Waterways. 2001. *South East Queensland Regional Water Quality Management*


Appendix A: Conservation Reserves in the Elanora-Palm Beach Management Cluster
<table>
<thead>
<tr>
<th>Park Name</th>
<th>Lot and Plan¹</th>
<th>Area Hectares</th>
<th>Ownership &amp; Tenure</th>
<th>Reserve Purpose² (applies to Qld State Land only)</th>
<th>Park Category³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avocado Park</td>
<td>985WD5996</td>
<td>2.01</td>
<td>State of Queensland (GCCC trustee)</td>
<td>Park and Recreation</td>
<td>Linear Park/Linkage</td>
</tr>
<tr>
<td></td>
<td>990WD5897</td>
<td></td>
<td>State of Queensland (GCCC trustee)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barlee Court Reserve</td>
<td>903RP889546</td>
<td>0.70</td>
<td>State of Queensland (GCCC trustee)</td>
<td>Park and Recreation</td>
<td>Linear Park/Linkage</td>
</tr>
<tr>
<td></td>
<td>905RP889546</td>
<td></td>
<td>State of Queensland (GCCC trustee)</td>
<td></td>
<td></td>
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<tr>
<td>Beree-Badalla Reserve</td>
<td>261WD5078</td>
<td>6.38</td>
<td>State of Queensland (GCCC trustee)</td>
<td>Park and Recreation</td>
<td>Utility Reserve/ Waterway-drainage Reserve</td>
</tr>
<tr>
<td></td>
<td>241WD4471</td>
<td></td>
<td>State of Queensland (GCCC trustee)</td>
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<tr>
<td></td>
<td>238WD4321</td>
<td></td>
<td>State of Queensland (GCCC trustee)</td>
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<tr>
<td></td>
<td>262SP148605</td>
<td></td>
<td>State of Queensland (GCCC trustee)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breynia Court Reserve</td>
<td>905RP899162</td>
<td>0.18</td>
<td>State of Queensland (GCCC trustee)</td>
<td>Park and Recreation</td>
<td>Recreation Park/Local Park</td>
</tr>
<tr>
<td>Bronhill Reserve</td>
<td>901SP113108</td>
<td>1.50</td>
<td>State of Queensland (GCCC trustee)</td>
<td>Park and Recreation</td>
<td>Linear Park/Linkage</td>
</tr>
<tr>
<td>Buckingham Way Reserve</td>
<td>3RP884341</td>
<td></td>
<td>State of Queensland (GCCC trustee)</td>
<td>Park and Recreation</td>
<td>Natural Areas/Conservation Area</td>
</tr>
<tr>
<td>Calcita Avenue Reserve</td>
<td>900RP868009</td>
<td>1.77</td>
<td>State of Queensland (GCCC trustee)</td>
<td>Park and Recreation</td>
<td>Linear Park/Linkage</td>
</tr>
<tr>
<td>Casey Park</td>
<td>104SP133610</td>
<td>1.59</td>
<td>State of Queensland (GCCC trustee)</td>
<td>Park and Recreation</td>
<td>Linear Park/Linkage</td>
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<tr>
<td></td>
<td>103SP133610</td>
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<td>State of Queensland (GCCC trustee)</td>
<td></td>
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<td></td>
<td>100WD6474</td>
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<td>State of Queensland (GCCC trustee)</td>
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<tr>
<td>Park Name</td>
<td>Lot and Plan</td>
<td>Area Hectares</td>
<td>Ownership &amp; Tenure</td>
<td>Reserve Purpose (applies to Qld State Land only)</td>
<td>Park Category</td>
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</tr>
<tr>
<td>Currumbin Waters Park</td>
<td>102RP835729</td>
<td>12.60</td>
<td>State of Queensland (GCCC trustee)</td>
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<td>Recreation Park/Foreshore Reserve</td>
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1 – Boundaries of the listed properties do not necessarily correspond entirely with those of the reserve; reserve boundaries are based on the extent of natural areas, not property boundaries.
3 – In accordance with Council’s Public Open Space Classification System.