

Planning Scheme Policy 4 - Ecological Impacts¹

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4.1 Introduction

Redland Shire covers large areas of natural coastline, the coastal islands of Moreton Bay, remnant bushland, and developed urban and rural areas. It is well recognised as one of the most biologically diverse areas of Queensland with an abundance of sub-tropical plants and animals. The wildlife habitats are diverse - ranging from tall eucalypt forest, to fresh and saltwater wetlands and unique island ecosystems. Redland Shire is part of a unique area on the eastern seaboard having tropical northern species and temperate southern species overlapping at the limit of their respective distributions.

This biodiversity is valued by residents. However, Redland Shire is part of Australia's fastest growing metropolitan region. It is no longer a rural Shire with some townships. Rather, it is now an expanding urban area in a bushland and coastal setting on the edge of the greater Brisbane metropolis. This growth is placing significant pressure on the ecosystems and the wildlife of the Redlands. In the Redlands, 19 plant species and 46 animal species are listed as vulnerable, rare or endangered. The threats to the survival of these animal and plant species include land clearing, habitat alteration, introduced pest species, and human activities.

¹ Redland Shire Council acknowledges the contribution of Brisbane City Council's 'Ecological Assessment Guidelines' on which parts of this policy are based. This policy recognises the need to keep a consistent approach to planning requirements among Councils in South East Queensland.



The challenge is to protect, manage, restore and enhance this biodiversity while accommodating managed urban growth.

Redland Shire Council has responded to this challenge with -

- policies such as the Local Law 6 - Protection of Vegetation, the Koala Conservation and Management Policy and Strategy, the Bushland Habitat and Corridor Plan, the Redland Shire Environmental Inventory, the Vegetation Enhancement Strategy;
- programs such as the Land for Wildlife, the Rural Support Program, the Bushcare Program, Voluntary Conservation Agreements and Your Back Yard Garden.

The Redland Shire community is committed to -

- the retention of native vegetation;
- the recovery of threatened plant and animal species;
- the prevention of species degradation; and
- the maintenance and enhancement of ecological processes.

The Redlands Planning Scheme also responds to this challenge. Through its Zones and Overlays, the planning scheme identifies areas where plants, animals, and habitats are such that detailed and comprehensive analysis of these ecological values will be required to assist in the assessment of development proposals.

4.2 Purpose

- (1) The purpose of this policy is to -
 - (a) set out the requirements for the preparation and submission of technical reports, including an Ecological Assessment Report, associated with development applications -
 - (i) affected by the Habitat Protection Overlay;
 - (ii) where ecological or environmental values may be -
 - a. impacted adversely as a result of proposed development; or
 - b. strategically enhanced as a result of proposed development.
 - (b) provide information relating to management of ecological impacts of development under the planning scheme.

4.3 Applicability

- (1) The policy applies to -
 - (a) development on land affected by -
 - (i) the Habitat Protection Overlay;
 - (ii) the Waterways, Wetlands and Moreton Bay Overlay;
 - (iii) the SMBI Residential Zone sub-area SR1;
 - (iv) the Flood Prone, Storm Tide and Drainage Constrained Land Overlay;
 - (b) development that is -
 - (i) likely to result in adverse impact on ecological values;
 - (ii) located in an area with significant ecological values;
 - (c) development that is impact assessable and for which ecological or environmental values are to be identified and managed.
- (2) Where a specific information request is made by the local government seeking more detailed information than that in this Policy, then the requirement for more detailed information takes precedence.



4.4 Interpretation

- (1) Part 9 - Schedule 3 - Dictionary defines terms used in the policy.
- (2) Section 4.6 - Glossary also defines terms used in the policy.

4.5 Formulating a Development Proposal

- (1) Undertake ecological assessment before determining potential development scenarios.
- (2) A detailed and comprehensive site analysis is the foundation of any good design and is carried out as the first step.
- (3) An ecological assessment report is required to identify the ecological values present and how the proposed development is likely to impact upon these values.
- (4) The recommendations of an ecological assessment report are required to ensure that development siting and design avoids, mitigates or minimises adverse impacts, or identifies how the development will restore and enhance ecological values.
- (5) It is strongly recommended that the applicant arrange a pre-lodgement meeting to determine if an ecological assessment report is required, the level of ecological assessment required, and discuss the scope of the ecological assessment prior to its commencement.
- (6) The local government may be able to contribute or recommend databases or schedules of relevant environmental data. This will help to ensure a more streamlined process once an application is lodged.
- (7) An ecological assessment report is a site survey and analysis with particular emphasis on the vegetation, flora, fauna, habitat, waterways and ecology.
- (8) Flora assessment aims to provide accurate assessment and documentation of existing vegetation, introduced and natives, at the level of community and increasingly individual plants, such as koala food trees.
- (9) Fauna assessment extends the approach to include the wildlife using the site and the habitat values of the area - terrestrial and aquatic, including migratory species.
- (10) Each development site has the potential to contribute to the habitat for fauna and flora, and wildlife movement opportunities, available in the landscape.

4.6 Approach to Ecological Assessment Reporting

4.6.1 Level of Ecological Assessment

- (1) The policy recognises two levels of ecological assessment -
 - (a) Level One or limited ecological assessment;
 - (b) Level Two or full ecological assessment.
- (2) In general, a Level One ecological assessment is required for code assessable applications for small-scale development or operational works with limited capacity to adversely impact on ecological values or processes at the site or in adjoining areas. This may include, for example, code assessable development in Koala Habitat of the Habitat Protection Overlay, or development that is for single dwelling house, dwelling addition, domestic outbuilding or private swimming pool.
- (3) In general, a Level Two ecological assessment is required for code assessable or impact assessable applications for large-scale development with potential for significant adverse impacts on ecological values or processes, or where development is located in areas with significant or sensitive ecological values. This may include, for example, development that is for extractive industry, general industry, environmentally relevant activity, or reconfiguration.
- (4) Where there is any doubt as to the applicable level of ecological assessment -
 - (a) a Level Two ecological assessment is considered as the default requirement; or
 - (b) the local government will determine the level of ecological assessment at the pre-lodgement or information request stage.



4.6.2 Scope of the Ecological Assessment Report

- (1) In each level of ecological assessment it is recognised that the level of detail in investigation and contained in the report may vary, relative to the -
 - (a) scale and likely impact of the development proposal;
 - (b) ecological values present;
 - (c) sensitivity of these values to development.
- (2) All ecological assessment reports should contain enough information to adequately identify, describe and assess -
 - (a) the significance of the ecological values and processes at the site and adjoining area;
 - (b) the threatening processes evident on site;
 - (c) the ecological links with adjacent land, at the local or regional scale depending on the scale of the development proposal;
 - (d) the potential impacts of proposed development on ecological values identified;
 - (e) the measures proposed in the development to enhance, such as restore or revegetate, identified ecological values;
 - (f) the measures proposed in the development to avoid, minimise, mitigate or manage the identified impacts.
- (3) The minimum requirement for a Level One ecological assessment is the completion by a suitably qualified person of a certification similar to that included in Appendix 4.
- (4) If the local government requests additional information that is not contained in this policy, the information request takes precedence.

4.6.3 Report Components in Brief

- (1) The minimum requirement for a Level One ecological assessment is the completion by a suitably qualified person of a certification covering the matters outlined above using the format provided in Appendix 4.
- (2) Otherwise, all Level One and Level Two ecological assessment reports should include the following sections -
 - (a) introduction to the background and objectives of the report;
 - (b) summary description of the development proposal;
 - (c) outline of the legislation, strategy and policy context;
 - (d) describe existing ecological values and site conditions, being the site analysis;
 - (e) detailed description of the site analysis and field survey methodologies used including the scope and duration of surveys, justification of methods and assessment of survey limitations;
 - (f) identify and assess potential environmental and ecological impacts of the development proposal;
 - (g) identify and assess potential avoidance, mitigation and management measures;
 - (h) identify and assess opportunities for ecological enhancement;
 - (i) statements of environmental commitments avoidance, management and control measures.

4.6.4 Experience and Qualifications

- (1) Persons are suitably qualified or experienced to undertake surveys for, or sign-off (certify) the Level One or Level Two ecological assessment report, or complete the Level One certification contained in Appendix 4.



- (2) A suitably qualified person is one who has attained a relevant tertiary qualification(s) in ecology, biology, botany, conservation biology, environmental planning or environmental engineering or related disciplines and has a minimum of five years of relevant work experience in the carrying out of survey, assessment and reporting of ecological features and processes in South-East Queensland, and preferably Redland Shire.
- (3) A suitably experienced person is one who may have no relevant tertiary qualification(s) but has a minimum of ten years of relevant work experience in the carrying out of survey, assessment and reporting of ecological features and processes in South-East Queensland, and preferably Redland Shire.
- (4) An outline of qualifications and experience for each person substantially contributing to survey or ecological assessment report is provided as an attachment to the ecological assessment report.
- (5) Persons may require a licence, approval or permit from Queensland National Parks and Wildlife Service to conduct their research, collect specimens, and the like. A copy of any licence or permit is included as an attachment to the ecological assessment report.

4.7 Ecological Assessment Report

4.6.5 Description of the Development Proposal

- (1) Describe the -
 - (a) location and extent of the study area and includes the area, external to the subject site, that will be affected by the proposal;
 - (b) general physical properties of the site, including geology, soils, hydrology and vegetation cover;
 - (c) existing use of the study area, and previous uses if known, including details of buildings, works, ownership, previous activities and use of potential contaminants, disposal of contaminants, construction of dams, levees, placement of fill, and the like;
 - (d) development proposal that has triggered the ecological assessment report, including the nature of the development, such as residential, commercial, industrial, and the like;
 - (e) location in relation to the existing or surrounding development, including any proposed surrounding development that is on the public record;
 - (f) planning scheme codes, overlays and policies that apply to the site;
- (2) Provide the name and qualifications of the person undertaking the ecological study and the person(s) involved in the study.

4.6.6 Planning, Policy and Legislative Context

- (1) Outline the Commonwealth, State and local government planning, policy and legislative context relevant or applicable to the site and development proposal.
- (2) Explain how the report will address the requirements of relevant legislation, policies and regulations and which particular sections or provisions are addressed.
- (3) Identify where additional application or assessment is required beyond the local government planning scheme.

Note -

This step helps to ensure that all relevant regulations are identified and addressed. It avoids overlap, duplication or conflicting requests for the preparation and assessment of technical documentation. It also ensures that applicants, consultants and assessment officers, whether local or State or Federal government, are aware of the overall process and their role within the process.



4.6.7 Ecological Site Assessment and Analysis

Note -

The requirements for this section are described in more detail in following sections of this policy.

- (1) Provide an accurate and clear identification of ecological features and processes of the proposed development site and its immediate area including -
 - (a) vegetation, native plants (flora) and native animals (fauna) by -
 - (i) species listed in Appendix 2, being recognised environmental values in the Redland Shire;
 - (ii) vegetation communities and species or fauna species;
 - (iii) edge effects and other disturbances;
 - (iv) spatial and temporal ecological processes, including seasonal use by fauna;
 - (v) habitat significance;
 - (b) ecological corridors and links;
 - (c) ecological features and processes;
 - (d) opportunities for enhancement of the above.
- (2) Provide maps and diagrams to present the findings of the site surveys.
- (3) All maps are prepared to scale and where possible at comparable scales (for overlay).
- (4) Reporting of the assessment and survey results including conclusions and recommendations that include -
 - (a) a main purpose of the flora and fauna surveys is to enable scientifically based conclusions and recommendations to influence the design, construction and operation of development proposals;
 - (b) conclusions and recommendations that are easy to understand and tailored to a potentially wide audience who may not have a science background, such as -
 - (i) developer;
 - (ii) property owner;
 - (iii) interested stakeholders;
 - (iv) general public;
 - (v) local Councillors;
 - (vi) local community groups;
 - (vii) environmental organisations;
 - (viii) other consultants involved in the application and assessment process.

4.6.8 Ecological Site Assessment Methodology - Vegetation Communities and Flora Assessment

- (1) Redland Shire was mapped at the vegetation community level in June 2001 in accordance with the vegetation classification systems used by the Queensland Herbarium and using an early version of the *Common Nature Conservation Classification System*.
- (2) The native plant communities identified in *Remnant and Non-Remnant Vegetation of Redland Shire 2001* form the basis for the Conservation Management Areas identified in the *Redland Shire Environmental Inventory*.
- (3) It is essential for timely assessment of vegetation mapping undertaken in support of the ecological assessment report that the mapping and methodology of *Remnant and Non-Remnant Vegetation of Redland Shire 2001* and *Redland Shire Environmental Inventory* is used. Both are available from Council electronically.
- (4) Assessment should include and address the mapping and approach of, and generally be consistent with -



- (a) the *Common Nature Conservation Classification System* as used by the Queensland Herbarium;
 - (b) regional level assessments conducted by the Environmental Protection Agency including -
 - (i) the South East Queensland Biodiversity Planning Assessment of the SEQ Regional Nature Conservation Strategy;
 - (ii) the Regional Ecosystem mapping;
 - (iii) South East Queensland Regional Coastal Management Plan.
- (5) For flora assessment the following is required -
- (a) describe and accurately map existing terrestrial and aquatic vegetation located within the application site and adjacent to it including -
 - (i) floristics - including age and botanical and common names;
 - (ii) structural formation - including identification of species composition by stratum or structural class from the upper canopy to the ground layer and using measures of canopy spread and percentage of openness, foliage cover;
 - (iii) condition or integrity of the vegetation;
 - (iv) level of existing disturbance - including the location and description of -
 - a. areas regenerating and their integrity and likelihood of survival;
 - b. weed growth²;
 - c. edge effects and ecotones;
 - (b) provide a survey accurate location plot of -
 - (i) koala habitat trees³ (or koala food trees) in Koala Habitat areas⁴; or
 - (ii) tree species with a trunk diameter of 100mm or more at breast height, at 1500mm above ground level;
 - (c) location and extent of any vegetation protected under Local Law 6 - Protection of Vegetation and the *Vegetation Management Act 1999*;
 - (d) describe the habitat significance of flora at the site within the local and regional context including , but not limited to, the following criteria -
 - (i) quality (naturalness);
 - (ii) diversity;
 - (iii) representativeness;
 - (iv) uniqueness;
 - (v) conservation status;
 - (vi) viability (connectivity);
 - (e) provide a survey accurate map of vegetation communities and significant flora, where possible use a GPS unit using Northing and Easting coordinates showing -
 - (i) contours at one metre intervals;
 - (ii) location of major and minor waterway corridors, including seasonal watercourses, dams and wetlands, whether existing, natural or constructed;
 - (iii) existing buildings and infrastructure such as roads and service lines;
 - (iv) existing easements and covenants;

² Refer to Part 9 - Schedule 12 – Weed Species List.

³ Koala habitat trees are defined in the Glossary, which uses the same definition as provided in the *SEQ Regional Plan Interim Guideline: Koalas and Development 2005* or visit the EPA website at www.epa.qld.gov.au.

⁴ Refer to Part 5 – Overlays, Division 7 - Habitat Protection Overlay Code.



- (v) proposed constructed features or development envelopes, service corridors, access corridors;
- (vi) proposed habitat enhancement corridors.

4.6.9 Ecological Site Assessment Methodology - Fauna Assessment

- (1) The Redland Shire is known to support an extensive range of native fauna species, many of which are currently listed as threatened, vulnerable and rare in the *Nature Conservation Act 1992 and Regulation*.
- (2) It is essential for timely assessment of habitat and fauna mapping be undertaken in support of the ecological assessment report consistent with the mapping and methodology of *Remnant and Non-Remnant Vegetation of Redland Shire 2001* and *Redland Shire Environmental Inventory*. Both are available from Council electronically.

Note -

Detailed assessments techniques such as trapping, baiting, spotlighting, and the like, will require permits from Queensland's Parks and Wildlife Services. Additional information on acceptable fauna survey techniques and periods in the Redland Shire are included in Appendix 1.

- (3) Identify all terrestrial and aquatic fauna species permanently or periodically observed as present or likely to be present within the site and adjoining areas throughout the year.
- (4) This will require comprehensive survey of all vegetation communities, ecotones and other ecological features present on the site and adjacent areas, in addition to searches and comprehensive presentation of detail found in available literature and fauna databases.
- (5) Identify and describe presence of old growth hollows, nests, fauna scats or markings.
- (6) Refer to Appendix 1 for methodology of surveying vertebrate fauna.
- (7) There is not preferred methodology for surveying invertebrate fauna.
- (8) Identify any evidence of edge effects and disturbances, the degree of effect or disturbance and their likely causes.
- (9) Identify spatial and temporal ecological processes operating at or adjacent to the site.
- (10) Describe the fauna habitat significance at the site within the local and regional context including, but not limited to the following criteria -
 - (a) quality (naturalness);
 - (b) uniqueness;
 - (c) diversity;
 - (d) conservation status;
 - (e) representativeness;
 - (f) viability/connectivity.
- (11) An acceptable approach to describing habitat significance is to use the *Common Nature Conservation Classification System (CNCCS)* developed by Chenoweth Environmental Planning and Landscape Architecture Pty Ltd for the Western Regional Organisation of Councils (WESROC) and endorsed by the South East Queensland Regional Organisation of Councils (SEQROC)⁵.
- (12) Assessment should also include and address the mapping and approach of, and generally be consistent with -
 - (a) relevant regional level assessments conducted by the Environmental Protection Agency including -
 - (i) the South East Queensland Biodiversity Planning Assessment of the *SEQ Regional Nature Conservation Strategy*;

⁵ Further information on the CNCCS can be obtained from the WESROC website (<http://www.wesroc.qld.gov.au/Projects.htm>).



- (ii) South East Queensland Regional Coastal Management Plan;
 - (b) relevant Commonwealth, State and regional conservation and recovery plans for rare, threatened, vulnerable and endangered species or species groups. Refer to bibliography.
- (13) Provide a survey accurate map depicting key community and species level information arising from the assessment and survey that -
- (a) shows the location of significant or critical habitat features including for example -
 - (i) hollow and nest bearing trees, nest locations;
 - (ii) roost, nest and den trees;
 - (iii) location and identification of scratch marks, scats and other traces;
 - (iv) ground diggings;
 - (v) fallen logs and rock outcrops;
 - (vi) fallen fruits and seeds;
 - (vii) sightings, traps, baiting and other fauna monitoring locations and techniques;
 - (b) where applicable include the location of zone and overlay boundaries;
 - (c) provide integration with vegetation mapping.
- (14) Provide detailed species lists that ensure a distinction is made between *observed fauna* lists and *likely to occur on site* lists.
- (15) Where possible link or reference lists to locality maps.
- (16) Fully describe fauna assessment methodology and on-site fauna survey techniques including -
- (a) specific objective of the fauna survey;
 - (b) criteria uses to design the sampling and survey system;
 - (c) justification of the techniques employed for each fauna group surveyed;
 - (d) time(s) and date(s) on which the survey was undertaken;
 - (e) commencement and duration times for each sampling and survey period;
 - (f) details of all technical equipment and how it was used in the survey process;
 - (g) size, type, number and location of traps, baits or other survey recording techniques;
 - (h) general comments on the limitations or problems associated with the fauna survey methodology including lack of seasonal variations in fauna usage, if relevant;
- (17) This information is described in sufficient detail to enable an independent consultant to replicate the survey and achieve comparable results.

4.6.10 Ecological Site Assessment Methodology - Wetlands, Water Bodies and Hydrological Patterns - Including Dams

- (1) The creeks and streams in Redland Shire convey flood waters to Moreton Bay, provide water quality improvement, provide movement corridors for wildlife and often are significant habitat areas. Protection, management and rehabilitation of waterways provide multiple benefits to the environment, landscape aesthetics and property protection.
- (2) Wetlands, water bodies and general hydrological patterns are intrinsically linked to ecological areas and functions and form part of an ecological assessment report.
- (3) Alterations to hydrology through the development process can significantly impact on the ecological functions of applications sites in positive and negative ways.
- (4) Locate, map and describe at the site and adjacent to the site -
 - (a) major and minor waterways;
 - (b) surface water bodies, such as wetlands, dams, lakes or the like;
 - (c) hydrological patterns;



- (d) riparian and in-stream vegetation communities;
- (e) extent, profile and general bed composition.

4.6.11 Ecological Site Assessment Methodology - Ecological Corridors and Functions

- (1) Ecological corridors are a well established concept in planning.
- (2) It is also well established that protecting and rehabilitating corridor links between habitat areas helps maintain biodiversity and the integrity of ecosystems.
- (3) Fragmentation and isolation of habitat reduces the diversity and viability of flora and fauna populations. The effects of geographical isolation may not be immediately visible, but often lead to local extinctions of vulnerable species over time.
- (4) Corridors of suitable structure, composition and extent enable wildlife movement between habitat areas, allowing genetic interchange between populations from different areas and opportunities for escape and recolonisation following environmental disturbances such as drought and fires. They provide a range of habitats and refuges to allow such genetic exchange.
- (5) Ecological corridors also aid the dispersal, pollination and recolonisation of plant species.
- (6) Ecological functions are identified at a broad landscape level in association with Conservation Management Areas identified in the Redland Shire Environmental Inventory.
- (7) Individual vegetation polygons or units are allocated functional descriptions such as patch, mosaic, corridor, link, and core.
- (8) In addition, other ecological functions are ascribed to certain areas and habitats at a level of resolution below that indicated in the Environmental Inventory. For example, the following are also recognised -
 - (a) high tide and critical high tide feeding and roosting sites for wading birds;
 - (b) hilltops used by hill topping butterflies;
 - (c) koala and wildlife road crossing locations;
 - (d) island sanctuaries protected from predation along the foreshore and in Moreton Bay;
 - (e) stands of older growth vegetation with tree hollows that provide sites for breeding, roosting and shelter.
- (9) At a broad level existing and potential ecological corridor locations and the ecological function of habitat areas have been mapped in the Redland Shire Environmental Inventory and reflected in the Bushland Habitat Overlay Map.
- (10) Locate and describe the configuration and composition of ecological functions over the application site and adjoining lands. Key descriptive elements should include -
 - (a) type, extent and description of vegetation;
 - (b) identification of fauna species observed and likely to utilise the ecological function / corridor;
 - (c) existing levels of disturbance and threats to the ecological function such as weeds, contextual clearing, and the like;
 - (d) areas of potential enhancement that are suitable through, restoration, regeneration, rehabilitation;
 - (e) critical support areas external to the application site.
- (11) Prepare a contextual map locating ecological features within and external to the application site and how these areas integrate and connect.
- (12) Where applicable plans and drawings include the location of zone and overlay boundaries and provide some integration with vegetation mapping.

4.6.12 Describe Field Survey Methodology

- (1) Provide a full description of the field survey methodology used and assumptions made, demonstrating -



- (a) adequate coverage of all major habitat types or vegetation communities, including ecotones, and exotic and pest species;
 - (b) use of survey techniques suited to targeting flora or fauna life histories;
 - (c) repeatability of survey techniques;
 - (d) adequate consideration of seasonal variations, timing, duration and climatic conditions.
- (2) Provide any past records of the site and adjoining lands being used by native fauna. Records can include research reports, local knowledge and databases, Nature Search (Wildnet), Queensland Museum and Queensland Herbarium or the like.
 - (3) Provide appropriate photographs, figures and maps that will enable the timely identification and location of important features on the ground, and replication of the survey effort.
 - (4) Provide details of all background investigations undertaken in preparing the report, including literature reviewed, recognised specialists, authorities and local naturalists consulted or referenced.
 - (5) Provide information on the assessment and survey methodologies, principles and techniques used in the survey.
 - (6) Provide data and information collected during site inspections and other research, such as the lists of native animals and native plants found on the site, and their conservation status.
 - (7) Where no significant fauna observations were made at a particular date and time, the absence of observations should be explained in terms of habitat quality and seasonal or diurnal variation.

4.6.13 Identify and Assess Potential Ecological Impact

- (1) Potential impacts on the identified ecological resources of the site and surrounding lands are determined prior to development and significantly influence development design and construction activities.
- (2) Development activities can and often do result in impacts on ecological values that may be -
 - (a) negative, such as -
 - (i) loss of habitat and species through clearing, earthworks and encroachment;
 - (ii) changes in air quality, noise, vibration, water quality, hydrological patterns, light emissions, dust and silt deposition;
 - (iii) changes in the location and pattern of human activities and the associated disturbances;
 - (iv) fragmentation of habitat, severance of movement corridors and the creation of barriers or other obstacles affecting the movement of native animals;
 - (v) changes in soil structure, nutrient levels, erosion, siltation and pollutant loads;
 - (vi) changes in the numbers and types of wildlife predators and prey;
 - (vii) introduction of non-native and pest animal species including stock and feral or domestic animals;
 - (viii) introduction of weed species;
 - (b) positive, such as -
 - (i) dedication of lands to permanent conservation management;
 - (ii) creation of managed and steady state habitat areas through restoration and replanting of areas set aside for conservation or open space;
 - (iii) control and eradication of pest animal species;
 - (iv) control and eradication of weed species;
- (3) Identify and describe the potential spatial and temporal (short and long-term) impacts of the development on species and vegetation communities, including consideration of both the construction and operational phases of the development.
 - (a) identify and describe the development and activities that may result in changes on the application site or surrounding natural environment (e.g. clearing of vegetation, filling, culvert



installation and traffic in connection with a new subdivision road to cross an existing natural drainage line), and for each describe -

- (i) the physical changes to the natural environment that result;
 - (ii) the likely impacts of these physical changes on identified ecological values;
 - (iii) the significance of these impacts;
 - (iv) the ecological consequences for habitats and species affected by these impacts (e.g. changes in plant species diversity, opportunities for weeds and reduction in riparian based fauna habitats from general area);
- (b) looking across the development and activities described above, comment on the combined impact on identified ecological processes and ecological values -
- (i) for the site as a whole;
 - (ii) for the whole site in the context of its landscape setting and ecological functions (with particular reference to the Conservation Management Areas identified in the Redland Shire Environmental Inventory).

4.6.14 Identify Opportunities for Ecological Enhancement

- (1) Describe and accurately map (survey) -
- (a) enhancement corridor, enhancement links and enhancement area categories identified on the Bushland Habitat Overlay Map;
 - (b) other opportunities or options for development to restore or enhance the ecological features, functions, habitat, corridors or links at the site and in context with its location in the landscape either as additions or alternatives to the enhancement link nominated in the Bushland Habitat Overlay Map.

Note -

These areas may currently have few, readily identifiable, ecological values or degraded ecological values and features. The enhancement area category of the overlay ensures that all development proposals contribute to rehabilitation of the Shire's environmental values.

4.6.15 Statements of Commitments to Ecological Enhancement

- (1) Provide a clear statement of commitment through specific actions and implementation measures to the restoration and enhancement of enhancement corridor, enhancement link, or additional or alternative approaches and enhancement areas.
- (a) Include details on -
 - (i) appropriately scaled drawings, the location and extent of activities or works to be carried out;
 - (ii) the current condition of the land to be rehabilitated or enhanced;
 - (iii) how the commitment will enhance the site's ecological values;
 - (iv) the timetable for implementation and integration with phases of the development such as construction, operation, decommissioning, maintenance or rehabilitation;
 - (v) who will be responsible for the work and handover arrangements to successive management, demonstrating relevant expertise;
 - (vi) how the areas will be managed to guarantee sustainable establishment;
 - (vii) areas, preferably in public ownership, external to the development site which could be enhanced.
- (2) Where native animals and native plant species, species groups or ecosystems that are listed as rare, vulnerable, and endangered, use or potentially use the development site or its immediate surrounding areas, the ecological assessment report -
- (a) provides background information on the species, including natural life history, habitat requirements, reproduction, behaviour, predation, competition and role within the ecosystem;



- (b) describe the current conservation status - including habitat loss, threatening processes, population size and structure on the site and in the Redland Shire;
- (c) demonstrate how the development will protect, manage and enhance the species and its habitat at the site, and individuals on the site;
- (d) include and describe management and actions that -
 - (i) will protect, manage and enhance the species and its habitat at the site, and individuals on the site;
 - (ii) are in keeping with any species recovery or conservation plans relevant to that species, species group or ecosystem;
 - (iii) include any significant off-site management or actions necessary to complement those taken on site;
 - (iv) ongoing monitoring and evaluation requirements and commitments;
- (e) state commitments to the above by the developer and commitments required of other parties.

4.6.16 Identify and Describe Avoidance, Mitigation and Management Measures

- (1) Identify and describe measures to avoid, mitigate and manage ecological and environmental impacts that may be incorporated into the nature of development, its siting and design, and operations during and after construction.
- (2) The purpose of these measures is to -
 - (a) eliminate, minimise, reduce, relocate or recognise the impacts on the environment;
 - (b) find ways of achieving development outcomes that have least environmental impact;
 - (c) maximise opportunities for environmental benefits within development projects;
 - (d) ensure unavoidable impacts on the environment are within acceptable levels;
 - (e) ensure measures are implemented as specified;
 - (f) provide systems for monitoring the effectiveness of measures;
 - (g) establish procedures for corrective actions should measures fail.
- (3) Prepare proposal and management plans, such as Vegetation Management Plan, detailing the location, extent and nature of all measures designed to prevent, avoid, mitigate or manage the identified impacts, including -
 - (a) timing of start and finish of measures;
 - (b) identification of responsibility and allocation of resources to undertake measures;
 - (c) list of actions to achieve measures;
 - (d) any monitoring or auditing program essential to the success of measures;
 - (e) contingencies for non-compliance and in-effective measures.
- (4) Information clearly demonstrates how the proposed mitigation strategies will enable the proposal to meet the nature conservation obligations as described in the relevant statutory planning mechanisms, in particular in relation to vulnerable, endangered or rare flora or fauna species, habitats or ecosystems affected.

4.8 Habitat Protection Overlay

4.6.17 Principles and Purpose of Habitat Protection, Management and Enhancement

- (1) The purpose of the Habitat Protection Overlay is to ensure that development protects and provides for the long-term management and improvement of environmental values. These values include -
 - (a) habitats necessary for the long-term life of native plants, animals and ecosystems;
 - (b) corridors, networks and areas that help movement of native animals;



- (c) koala habitat;
 - (d) native animals, native plants and ecosystems that are common, vulnerable, rare or endangered as defined by the *Nature Conservation Act 1992*.
- (2) The Overlay requires development to protect existing environmental values through various measures. This may involve siting the development in a suitable area of the property that does not interfere with the environmental values. Often development will have to be setback a certain distance from bushland or marine habitat, or outside enhancement corridors. In certain areas development needs to improve environmental values through re-vegetating degraded areas with native plants and removing weed species.
- (3) The Redland Shire Council recognises eleven broad principles that underpin the protection, management and enhancement of habitat in the Shire. These are -
- (a) Principle 1: In order to protect biodiversity, all the important habitat types in the Shire must be protected and managed not just the ones that are easiest to protect or that we most like;
 - (b) Principle 2: In Redland Shire we protect and manage habitat areas for all the species present and, where information is available, act to the benefit of individual species where possible;
 - (c) Principle 3: The more like natural bush, the greater the habitat value of an area. Management should aim for complex, diverse, multi-layered bush with understorey that closely approximates that which existed prior to European settlement;
 - (d) Principle 4: Our first priority is to protect and manage the habitat we have because once it is lost it is gone for good;
 - (e) Principle 5: Many cleared areas provide some habitat and freedom of movement for native animals, which can be essential to their survival. These values must be recognised, managed and enhanced if wildlife is to be protected in Redlands;
 - (f) Principle 6: In replacing habitat, allow the bush to regenerate naturally wherever possible and where replanting is required, provide clear guidance regarding appropriate standards for replanting work;
 - (g) Principle 7: In addition to managing 'generalised' habitats for wildlife, the local government must address the specific survival needs of some species of concern and some ecosystems and some areas of concern;
 - (h) Principle 8: Core habitat areas must be protected and maintained as 'reservoirs' and sanctuaries for wildlife in the network of habitat across the landscape;
 - (i) Principle 9: Patches of bushland must be protected managed and enhanced for their value as habitat, particularly those in lowland areas that function as 'nodes' in the network of habitat and corridors across the landscape;
 - (j) Principle 10: A web of wildlife corridors and linkages must be maintained and established to allow wildlife to move across the landscape and in particular between habitats;
 - (k) Principle 11: Barriers to wildlife movement must be identified and managed preferably removed wherever possible, to promote safe movement of animals across the landscape and in particular between habitats.

4.6.18 Relationship to Local Law 6 - Protection of Vegetation

- (1) The local government operates three Local Laws relevant to habitat and corridor management. These are -
- (a) Local Law No. 6 - Protection of Vegetation;
 - (b) Local Law No. 15 - Parks and Reserves;
 - (c) Local Law No. 18 - Nuisances.
- (2) Of these, Local Law No. 6 - Vegetation Protection and Vegetation Protection Orders under the Local Law are the most important for protecting habitat on private land.
- (3) Local Law No. 6 states that, "unless permitted, a person must not damage protected vegetation" and details the maximum penalties, which may include replanting/regeneration of the native vegetation.



- (4) Habitat is mainly protected under Local Law 6 on freehold land through a Vegetation Protection Order (VPO) made by resolution of the local government. An expert report is prepared identifying the vegetation to be protected and the criteria for its protection. The local government will notify the public and affected land owners, and keep details on the local government's land record as well as in a public register. Large areas of the Shire fall under a Vegetation Protection Order.
- (5) The Habitat Protection Overlay replaces the former role of 'Greenspace' in Local Law 6 where vegetation in areas shown as Greenspace on the *Strategic Plan 1988* was automatically regarded as 'protected vegetation' under Local Law 6. For the purposes of Section 24(b) of Local Law No.6 – Protection of Vegetation, the Koala Habitat, Bushland Habitat, Enhancement Corridor, Enhancement Habitat, Enhancement Linkage and Marine Habitat depicted on the Bushland Habitat Overlay Map is the land described in section 24(b) as land which is indicated in a Development Control Plan, Local Area Plan or Strategic Plan as land that is or may be required for Greenspace and also indicates that the land is worthy of special protection, and that the land is not currently zoned for that purpose.

4.6.19 Relationship to Remnant Vegetation Under the Vegetation Management Act 1999

- (1) The definition of 'assessable development' under Schedule 8, Part 1, Table 4 of the *Integrated Planning Act 1997*, and relationship to the *Vegetation Management Act 1999* (VMA), establish that clearance of non-remnant vegetation in the Shire is not included as 'assessable development' under IPA.
- (2) Vegetation defined as 'category X' under the VMA - being non-remnant or regrowth, is specifically exempted under the VMA and the IPA definitions of 'assessable development'.
- (3) However, regrowth areas are recognised and protected for their high conservation values in Redland Shire mainly but not exclusively through -
 - (a) Zones and in particular the Conservation and Environmental Protection Zones;
 - (b) Habitat Protection Overlay.
- (4) All native vegetation is protected to the extent specified in the Habitat Protection Overlay in addition to the requirements for remnant vegetation under the *Vegetation Management Act 1999* and *Integrated Planning Act 1997*.

4.6.20 Role of the Environmental Inventory Stage 4

- (1) The Habitat Protection Overlay Map is a simplification of the Environmental Inventory Stage 4 (EIS4) mapping adopted by Council.
- (2) Used as a planning tool for focusing Council policy and actions where natural values are highest, the EIS4 is used as a basis for designating areas as the Conservation Zone and Environmental Protection Zone.
- (3) The methodology for translating the EIS4 to the zones and overlay is a public document and available on the RSC website.
- (4) The EIS4 is not a fauna and flora descriptive tool, despite its title, as it also provides mapping of the Shire's habitats and their ecological function.
- (5) It links habitat values to a planning and management response by using categories called Conservation Management Areas (CMA).
- (6) The CMA code indicates firstly the area's status, being Priority, Major, General, Enhancement, and also the areas structure and function in the landscape, Habitat, Patch, Corridor, Foreshore, Link, Mosaic.
- (7) As such, it clearly indicates areas where the Council wishes to "protect, maintain and rehabilitate environmental values and biodiversity" and "enhance community lifestyle and the natural environment".
- (8) The EIS originated from an aerial photographic assessment of vegetation and habitats by Chenoweth Environment Planning and Landscape Architecture.
- (9) Accompanying the original inventory was a report describing the conservation significance of each CMA. Since that time, incremental adjustments have been made to the EIS to account for



changes in vegetation cover resulting from development approvals, errors, omissions and new information.

- (10) The EIS 4 does not extend into adjacent local authorities, cover Moreton Bay, extend to the Southern Moreton Bay Islands or North Stradbroke Island.
- (11) The EIS4, contains four categories of CMA, each of which is further subdivided according to broad ecological function as -
- (a) **Priority** which includes -
 - (i) Priority Habitat (PH);
 - (ii) Priority Corridors (PC);
 - (iii) Priority Tidal (PT);
 - (iv) Priority Patch (PP);
 - (v) Priority Foreshore (PF);
 - (b) **Major** which includes -
 - (i) Major Habitat (MH);
 - (ii) Major Corridor (MC);
 - (iii) Major Foreshore (MF);
 - (iv) Major Patch (MP);
 - (v) Major Link (ML);
 - (vi) Major Mosaic (MM);
 - (c) **General** which includes -
 - (i) General Habitat (GH);
 - (ii) General Corridor (GC);
 - (iii) General Patch (GP);
 - (iv) General Links (GL);
 - (v) General Mosaic (GM);
 - (d) **Enhancement** which includes -
 - (i) Enhancement Corridors (EC);
 - (ii) Enhancement Foreshore (EF);
 - (iii) Enhancement Link (EL);
 - (iv) Enhancement Habitat (EH);
 - (v) Enhancement Tidal (ET).
- (12) The EIS4 CMAs are grouped to provide simplified categories in the Bushland Habitat Overlay Map of the Habitat Protection Overlay as detailed in Table 1.

Table 1 - Conversion of CMAs to Overlay Categories

Ecological Function Sub Areas of EIS 4	Conservation Management Areas of EIS 4			
	Priority	Major	General	Enhancement
Tidal	Marine Habitat	-	-	Enhancement Corridor
Foreshore	Bushland Habitat	Bushland Habitat	-	Enhancement Corridor
Habitat	Bushland Habitat	Bushland Habitat	Bushland Habitat	Enhancement Area
Patch	Bushland Habitat	Bushland Habitat	Bushland Habitat	-
Mosaic	-	Bushland Habitat	Bushland Habitat	-
Corridor	Bushland Habitat	Bushland Habitat	Bushland Habitat	Enhancement Corridor
Link	-	Bushland Habitat	Bushland Habitat	Enhancement Linkage



- (13) A set of preliminary rules was used as a basis for the allocation of land in the Shire to Bushland Habitat Overlay categories as described in the document titled '*Preliminary rules for use of Environmental Inventory Stage 4.1 in Overlay and Zones of the draft Planning Scheme*': 23 August 2005 (available electronically from the Council).
- (14) A manual check and verification of the outcome of the conversion was undertaken and additional filtering steps were considered before arriving at the final outcome as depicted on the Bushland Habitat Overlay Map for any particular lot.

4.8.1 Terminology of the Habitat Protection Overlay

- (1) The Habitat Protection Overlay Code Includes the following maps and categories -
- (a) Bushland Habitat Overlay Map categories are -
- (i) Enhancement Area;
 - (ii) Enhancement Link;
 - (iii) Koala Habitat;
 - (iv) Enhancement Corridor;
 - (v) Bushland Habitat;
 - (vi) Marine Habitat;
- (b) State Koala Policy Map (which is the map included in the State Government's *SEQ Regional Plan 2005-20016 - Interim Guidelines: Koalas and Development*) categories are -
- (i) Koala Conservation;
 - (ii) Koala Sustainability;
 - (iii) Urban Koala Areas.

4.8.2 Enhancement Habitat

- (1) Enhancement Areas are cleared areas that are part of the habitat of native animals, or that provide a reasonable freedom of movement for native animals in comparison to that offered by, for example, urban lots, shopping centres, or industrial lots.
- (2) Avoiding further barriers to movements of native animals and undertaking some replanting to improve movements of native animals in Enhancement Areas contributes to the long-term survival of native animal populations, such as koalas.
- (3) Enhancement Areas -
- (a) comprise land that has been primarily cleared of vegetation;
 - (b) present wildlife with a reasonable freedom of movement to nearby habitat and/or vegetation;
 - (c) represent an area where barriers to native animal movements should be avoided in the future and safe crossings implemented where needed to cross railways or roads;
 - (d) represent an area where native animal movements should be encouraged and enhanced through replanting of native vegetation and other artificial habitat enhancements such as nesting boxes, refuge poles for koalas;
 - (e) represent an area which provides vegetated or un-vegetated buffers to intact habitat areas, reducing the impact of edge effects.

4.8.3 Enhancement Corridor

- (1) Enhancement Corridors are cleared or partially cleared areas where there are opportunities to create and protect wildlife corridors between significant bushland, foreshore and tidal habitats nearby.
- (2) Intensive replanting, regeneration and habitat re-construction techniques can enhance corridor function by increasing and improving the connectivity and robustness of habitats, thereby contributing to the long term survival of species and ecosystems.



- (3) Adjacent to foreshores, enhancement corridors also protect tidal wetland areas and the coastal ecosystems.
- (4) Dams may be included in enhancement corridors for their habitat function, but a width of relatively dry land within the corridor for movement of terrestrial animals and arboreal animals is needed to maintain effective corridor function.
- (5) Enhancement Corridors have the following attributes -
 - (a) are cleared or degraded areas where there are opportunities for enhancement to create better wildlife corridors between significant habitats;
 - (b) are sited along drainage lines, waterways, foreshores, and between existing patches of vegetation;
 - (c) incorporate existing stands of vegetation, such as individual trees, lines of trees, trees along a boundary fence or waterway where enhancement builds on the habitat and linkage functions already present;
 - (d) are 100 metres wide, and measured from the high tide mark or 50 metres from the top of each bank, unless there is an existing immovable constriction which limits that width. In such a case, a wider width on the opposite bank is preferred to compensate for loss of width on the other bank where possible;
 - (e) are wider than 100 metres where the corridor incorporates a structure or features such as a dam or other elements that may limit wildlife movement;
 - (f) there are sight distances of 50 metres, or more, for vehicular traffic where corridors cross roads, and wildlife is encouraged to cross the road rather than moving beside the road before crossing, which is not always possible;
 - (g) signs, rumble strips, speed limits, tunnels, fauna bridges, raised roads, exclusion fencing and other appropriate actions are undertaken to improve the safety of fauna crossing roads, particularly where there is a corridor intersecting with a road;
 - (h) are sometimes enhanced as a compensation for removing existing vegetation, such that there is a net improvement or no net loss of ecological values.

4.8.4 Enhancement Links

- (1) Enhancement Links are cleared or degraded areas where there are opportunities for replanting or revegetation that will link patches of bush with significant bushland habitats nearby, such as Marine Habitat and Bushland Habitat.
- (2) Enhancement and linking improves the connectivity and robustness of habitats, and therefore the long term survival of species and ecosystems.
- (3) Enhancement Links differ from Enhancement Corridors in that -
 - (a) they do not run along creeks, waterways, or drainage lines, but rather are often located along property boundaries or hills, or at the closest linking position between two patches of bushland;
 - (b) their general location is indicated on the Bushland Habitat Overlay Map but the exact design and location is negotiable where developing areas are planning open space networks and corridors.
- (4) The location of links in the landscape is dependant on the best location to achieve connection of patches of habitat, the location of existing vegetation between the patches of habitat, the reduction of edge effects of the link and the habitat patches, and the cost of rehabilitation.
- (5) Enhancement Links have one or more of the following attributes -
 - (a) substantially or totally cleared or degraded area;
 - (b) often contain individual trees or lines of trees;
 - (c) present opportunities for replanting to link patches of bush with habitat areas;
 - (d) opportunity for potential expansion or widening of an existing link;
 - (e) should be 100 metres wide unless there is a barrier preventing achievement of that width;



- (f) a link should be wider than 100 metres where it incorporates a structure or features such as a dam so that terrestrial fauna can move through the link;
- (g) a link is designed to facilitate animal movement between habitat areas and as such it is not essential in all cases than it achieves a fixed specified width or provides a functional role as habitat;
- (h) contain few barriers to movement of wildlife;
- (i) there are sight distances of 50 metres, or more, for vehicular traffic where corridors cross roads, and wildlife is encouraged to cross the road rather than moving beside the road before crossing, which is not always possible;
- (j) signs, rumble strips, speed limits, tunnels, fauna bridges, raised roads, exclusion fencing and other appropriate actions are undertaken to improve the safety of fauna crossing roads, particularly where there is a corridor intersecting with a road.

4.8.5 Bushland Habitat

- (1) The Bushland Habitat category includes large areas of the mainland of the Shire where significant bushland currently exists.
- (2) Bushland Habitat includes all of the habitat identified as Priority, Major or General Conservation Management Area in the Environmental Inventory Stage 4, with the exception of some koala habitat and Marine Habitat areas among these CMAs.
- (3) Bushland Habitat includes -
 - (a) Priority areas comprising -
 - (i) bushland in natural or near natural condition;
 - (ii) all areas of State and Regional biodiversity or conservation significance;
 - (iii) large tracts of continuous bushland with minimum disturbance;
 - (iv) all remnant vegetation;
 - (v) estuarine and freshwater wetlands above high tide mark on the mainland coast, waterways and the island environments of Moreton Bay;
 - (vi) all Ramsar wetland sites above high tide mark.
 - (b) Major Areas comprising -
 - (i) bushland adjacent, or in close proximity to, Priority Areas;
 - (ii) semi-isolated remnants of moderate size and fragmentation with low level of disturbance that may not always be continuous;
 - (iii) large areas of dense mosaic bushland frequently interspersed by small patches of clearing;
 - (iv) areas functioning as smaller bushland habitats, corridors, links and mosaic areas;
 - (v) in natural or near natural condition;
 - (vi) all areas of local biodiversity or conservation significance;
 - (c) General Areas comprising -
 - (i) smaller patches and strips of native vegetation which although often highly disturbed, still provide habitat niches, stepping stones and local corridors for fauna and are significant at a local level;
 - (ii) represent examples of vegetation associations formerly more widespread throughout the region;
 - (iii) vegetation that is regarded as regrowth under the Common Nature Conservation Classification System;
 - (iv) scattered bushland with local habitat and amenity value;



- (v) areas where small patches of native vegetation and individual trees form a mosaic of native vegetation with highly disturbed areas, often interspersed with houses, sheds and roads.

4.8.6 Marine Habitat

- (1) Marine Habitat category includes large areas adjacent to the mainland of the Shire where significant tidal habitat currently exists.
- (2) Marine Habitat includes all of the Priority Tidal Conservation Management Areas identified in the Environmental Inventory Stage 4.
- (3) Marine Habitat category includes areas between high tide and low tide mark that -
 - (a) are significant tidal ecosystems in natural or near natural condition;
 - (b) are areas of state and regional biodiversity or conservation significance;
 - (c) support aquatic based flora and fauna communities;
 - (d) have a water quality maintenance function;
 - (e) are mangrove, salt marsh and mudflat habitat areas;
 - (f) are tidal wetlands on the mainland coast, associated waterways and island environments of Moreton Bay;
 - (g) are Ramsar wetland sites.

4.8.7 Koala Habitat

- (1) The Koala Habitat category of the Habitat Protection Overlay mainly covers private land with zones that allow for urban development that is likely to remove koala habitat.
- (2) In particular, the Koala Habitat outcomes focus on koala habitat trees and aim to achieve three main outcomes where a development is proposed -
 - (a) retention of koala habitat trees to the extent practicable;
 - (b) ensuring that adequate buffers are in place between retained koala habitat trees and development;
 - (c) ensuring that where koala habitat trees are removed, they are replaced such that there is no net loss of koala habitat trees.

4.8.8 Explanation of H1, H2 and H3 Areas

- (1) The Habitat Protection Overlay Code applies different specific outcomes to proposed uses and other development depending on the location of development within what are termed H1, H2, and H3 areas.
- (2) The following scenarios are used because it is necessary to be very clear about exactly where on a lot a development is proposed.
- (3) On a lot or premises that is triggered by the Bushland Habitat Overlay map - that is, some part of the lot is covered by one of the map categories being Enhancement Area, Enhancement Link, Koala Habitat, Enhancement Corridor, Bushland Habitat and Marine Habitat -
 - (a) the H1 area refers to the area of a lot or premises that IS NOT covered by any Overlay category on the Bushland Habitat Overlay map. This part of the lot is therefore least constrained and the better location for any development;
 - (b) there may be no H1 area; for example where the lot is entirely covered by one or more of the map categories above, in this instance either H2 or H3 areas apply;
 - (c) the H2 area refers to the area of a lot or premises that IS shown as covered by any overlay category on the Bushland Habitat Overlay map;
 - (d) this part of the lot is therefore more constrained by the Overlay and the more ecologically sensitive location for any development;



- (e) the H2 area may be shown as any one or a combination of the Enhancement Area, Enhancement Link, Koala Habitat, Enhancement Corridor, Bushland Habitat and Marine Habitat categories;
- (f) the H3 area refers to the area of a lot or premises that is shown on the State Koala Policy Overlay Map as being partly or wholly within the Koala Conservation, Koala Sustainability or Urban Koala Areas;
- (g) there is always a H2, or H3 area or both on a lot or premises that is affected either of the Habitat Protection Overlay Maps;
- (h) the H3 area may overlap H1 or H2 areas or both on any lot or premises.

4.9 Application of the Overlay

- (1) Most material change of use and development are code assessable under the Habitat Protection Overlay.
- (2) The Habitat Protection Overlay Code applies to a development applies where a lot or premises is wholly or partly covered by any one of the categories shown on either the -
 - (a) Bushland Habitat Overlay Map; or
 - (b) State Koala Policy Map, which is the map included in the SEQ Regional Plan 2005-2026 - *Interim Guidelines: Koalas and Development*.
- (3) If neither of these Overlay Maps shows a category covering any part of the lot or premises, the Habitat Protection Overlay does not apply to the development.
- (4) In urban areas, the Overlay Map categories follow biological rather than cadastral boundaries that often cut across land tenure boundaries.
- (5) Where only a small part of a lot is affected by the Overlay - such as a patch of trees, or a waterway, or an ecological corridor - the larger part may be perceived as of little ecological value, for example on larger undeveloped lots that are cleared.
- (6) Often the valued ecological feature may be largely adjacent to or located on a neighbouring lot that may not be considered as part of the development site.
- (7) In these situations, the Overlay focuses on -
 - (a) directing development away from parts of the lot with more ecological value to parts with less ecological value;
 - (b) protection and management of the, sometimes small, valued areas of the lot in the course of development that occurs nearby on the lot or surrounding it;
 - (c) enhancement works and activities on any part of the lot that will help restore or consolidate the ecological values present, such as Enhancement Linkages.

4.8.9 Basic Habitat Protection Measures for Development

- (1) Many of the zones in the planning scheme include overall outcomes that require uses and other development to -
 - (a) maximise the retention of native vegetation;
 - (b) maximise the use of planting species that are native and characteristic to the area;
- (2) Generally, vegetation may only be removed from the development site -
 - (a) within designated development envelope area;
 - (b) where necessary for the construction of works and services;
 - (c) where necessary for the construction of access to designated development envelopes, dams or similar development components;
 - (d) where necessary for public safety, or continuing health of desired native specimens.
- (3) Placement of proposed development footprints too close to desired vegetation, on the site or adjacent property or road reserve will not be acceptable.



- (4) All uses and other development affected by the Habitat Protection Overlay other than reconfiguration must meet a basic standard of habitat protection, including -
- (a) development is located -
 - (i) a minimum of 100 metres from any land shown as marine habitat; or
 - (ii) a minimum of 60 metres from any land shown as bushland habitat; or
 - (iii) outside any land shown enhancement corridor; or
 - (iv) within a development envelope;
 - (b) development does not remove native plants from outside a development envelope, where it is within marine habitat, bushland habitat or an enhancement corridor;
 - (c) road works, services and driveways are co-located where practicable to minimise loss or disturbance of native vegetation, particularly large trees.
 - (d) on lots with development envelopes, circular, that is one-way, driveways are not acceptable unless it can be demonstrated that these are necessary because of -
 - (i) topography;
 - (ii) natural constraints; or
 - (iii) a requirement to preserve a natural feature such as a significant large tree;
 - (e) any re-vegetation or landscaping uses native plants identified in Schedule 10 - Vegetation Species List as being suitable to the location;
 - (f) removal of weed species identified in Schedule 12 - Weed Species List from the entire site;
 - (g) design accessway design limits vehicle speed to 30km per hour;
 - (h) locate and design accessways between roads and the development or development envelope to minimise the need for vegetation clearance and to allow for infrastructure provision;
 - (i) locate fencing, within the development envelope or outside any land shown as marine habitat, bushland habitat, enhancement corridor and design to fauna friendly fence standard;
 - (j) development does not result in artificial light being directed into an enhancement corridor, bushland habitat or marine habitat.
- (5) Reconfiguration meets the same basic standard of habitat protection, as detailed above, with the exception that -
- (a) roads design limits vehicle speed to 30km per hour;
 - (b) lot creation incorporates development envelope(s) that are of sufficient size to contain all expected uses and associated activities, including buildings, structures, infrastructure and access;
 - (c) the requirement regarding artificial light being directed into an enhancement corridor, bushland habitat or marine habitat, is not relevant.
- (6) In addition to the basic standard of habitat protection, additional measures to protect habitat are necessary according to the Overlay Map categories present on the development site and indicated on the Bushland Habitat Overlay Map. These are detailed below.

4.8.10 Additional Measures for Enhancement Areas

- (1) Enhancement areas increase habitat opportunities and improve movement of native animals between habitat areas.
- (2) These outcomes are achieved by -
 - (a) Uses and other development, other than reconfiguration -
 - (i) incorporate and address the requirements of the basic standard of habitat protection;
 - (ii) minimises removal of native plants within an enhancement area, particularly mature trees, plants that form corridors for movement of native animals, trees along fence lines, and groups of trees;



- (iii) plant, within the lot or premises, a minimum of one native tree or shrub per 400m² of enhancement area, that are selected from Schedule 10 - Vegetation Species List as being suitable to the location;
- (b) Reconfiguration -
 - (i) incorporates and addresses the requirements of the basic standard of habitat protection;
 - (ii) incorporates and addresses the additional requirements for enhancement area listed above;
 - (iii) plant within the road reserve, a minimum of five trees or shrubs per lot created that are native species selected from Schedule 9 - Street Trees as being suitable to the location.

4.8.11 Additional Measures for Enhancement Links

- (1) Enhancement Links should identify, establish, protect and enhance the function and long-term viability of the corridor and allow for movement of native animals between habitat areas.
- (2) These outcomes are achieved by -
 - (a) Uses and other development, other than reconfiguration -
 - (i) incorporating and addressing the requirements of the basic standard of habitat protection;
 - (ii) identifying the most suitable location for the enhancement link;
 - (iii) being directed away from the link area, where possible;
 - (iv) identifying and retaining habitat trees, old and dead standing trees, ground logs and bush rocks, wherever possible, within the enhancement link;
 - (v) where the link is less than 100 metres wide, replanting native vegetation of appropriate species to expand the link to a maximum of 100 metres in width;
 - (vi) minimises edge effects on the link;
 - (vii) limiting fencing and other barriers to wildlife movement within the link and use fauna friendly fencing standard as a priority where fencing is required;
 - (b) Reconfiguration -
 - (i) incorporates and addresses the requirements of the basic standard of habitat protection;
 - (ii) incorporates and addresses the additional requirements for enhancement link listed above;
 - (iii) plant within the road reserve, a minimum of five trees or shrubs per lot created that are native species selected from Schedule 9 - Street Trees as being suitable to the location.

4.8.12 Additional Measures for Enhancement Corridors

- (1) Enhancement Corridors should identify, establish, protect and enhance the function and long-term viability of the corridor and allow for movement of native animals between habitat areas.
- (2) These outcomes are achieved by -
 - (a) all uses and other development other than reconfiguration -
 - (i) incorporating and addressing the requirements of the basic standard of habitat protection;
 - (ii) incorporating and addresses the requirements for enhancement link;
 - (iii) retaining old and dead standing trees, ground logs and bush rocks, wherever possible, within the enhancement corridor;
 - (iv) where the enhancement corridor is less than 100 metres wide, replanting native vegetation of appropriate species to expand the corridor to a minimum of 100 metres in width;
 - (v) replanting native vegetation within the lot or premises, by planting a minimum of one native tree or shrub per 5m² of corridor area with species selected from Schedule 10 - Vegetation Species list as being suitable to the location;



- (vi) replanting native vegetation within any degraded bushland habitat or marine habitat within the lot or premises, by planting a minimum of one native plant per 5m² in the bushland habitat or marine habitat areas with species selected from Schedule 10 - Vegetation Species list as being suitable to the location;
- (b) Reconfiguration -
 - (i) incorporates and addresses the requirements of the basic standard of habitat protection;
 - (ii) incorporates and addresses the additional requirements for enhancement corridor listed above;
 - (iii) incorporates and addresses the requirements for enhancement link;
 - (iv) undertakes an ecological assessment report as a component of the development;
 - (v) plants within the road reserve, a minimum of five trees or shrubs per lot created that are native species selected from Schedule 9 - Street Trees as being suitable to the location.

4.9.1 Design of Enhancement Links and Corridors

- (1) Movement of fauna and flora between patches of habitat is dependent on key design principles being adopted when planning for development or a change in land use.
- (2) These principles are briefly detailed below.
- (3) For more detailed information regarding corridor design concepts and principles refer to the literature sources provided in Bibliography.
- (4) Ecological corridors should be as wide as possible by -
 - (a) achieves the corridor widths are set out in the planning scheme code, overlays and maps;
 - (b) achieves wider corridors that are used by a wider range of fauna types and remain more effective over time. The minimum corridor width of 100 metres is recommended to facilitate movement of mammals and other terrestrial wildlife through bushland areas. However, widths of up to 500-700 metres may be necessary to provide protection to forest-dwelling birds from aggressive edge-dwelling birds.
- (5) An ecological corridor should provide adequate habitat by -
 - (a) providing sufficient area and types of habitat suitable for the full range of fauna species that inhabit or move through the local area;
 - (b) considering the diversity and structural complexity of the vegetation communities present. For example, densely vegetated riparian corridors may not support the dispersal or movement of koalas between critical habitats in the long term. Conversely, sparsely vegetated open woodlands may inhibit the successful movement of species such as the swamp wallaby (*Wallabia bicolor*) which require greater vegetation coverage and density.
- (6) Minimise interruptions to the ecological corridor by -
 - (a) removing interruptions and intrusions to the corridor that encourage environmental weeds, domestic animals and illegal dumping. Infrastructure and services such as roads, sewerage and water mains, and electricity easements can present barriers to wildlife movement and dispersal. The extent of disruption to any particular species will depend on the ecology or life history of that species, and the nature and extent of the intrusion. For example, regular slashing of an understorey within an easement interrupts connectivity of the corridor, effectively barricading movement of ground-dwelling mammals as a result, although it may not affect the movement of the local forest bird community.
 - (b) where the provision of service infrastructure and other intrusions is necessary, a common disturbance corridor or easement should be used where possible.
 - (c) using construction techniques and maintenance regimes that minimise disturbance to the corridor, wherever possible.
- (7) Minimise edge effects that include -
 - (a) increased or decreased solar radiation;
 - (b) increased or decreased wind and temperature;



- (c) decreased relative humidity;
 - (d) increased nutrients;
 - (e) changes in soil chemistry;
 - (f) modified hydrological regimes, such as increase or decrease in channel, surface and groundwater flows;
 - (g) increased fire intensity or frequency;
 - (h) introduction of rubbish including green wastes;
 - (i) increased pedestrian access resulting in greater disturbance;
 - (j) changes in vegetative structure and composition;
 - (k) increased weed diversity and abundance;
 - (l) spread of exotic lawn and groundcover species;
 - (m) increase in pioneer flora species;
 - (n) increased opportunistic aggressive fauna;
 - (o) changes in animal behaviour;
 - (p) increased predation;
 - (q) increased artificial lighting;
 - (r) increased noise levels;
- (8) Given the narrow width of remnants and corridors in an urban setting it is not possible to eliminate the degrading influence of all edge effects. However, it is possible to reduce their impact.
- (9) Corridor widths must take edge effects into account. If penetration by edge effects is for example, 10 metres, then a corridor would need to be substantially more than 20 metres wide to compensate for the disturbance on its edges.
- (10) Edge effects and other indirect impacts of development on ecological features and processes within or adjacent to the site should be identified, avoided or mitigated by best practice planning and design measures.
- (11) Acceptable measures include, but are not limited, to -
- (a) retain bushland habitat areas in a compact form, such as roughly circular or rectangular, to minimise perimeter to area ratios;
 - (b) keep corridor edge lines simple - avoid convoluted or indented boundaries;
 - (c) create or retain a buffer or separation area incorporating ecologically compatible activities adjacent to the habitat area, such as gardens, parkland, sporting fields or low density housing;
 - (d) set back development at least 100 metres from a freshwater wetland, or the Highest Astronomical Tide line of a tidal wetland;
 - (e) a distance from bushland habitat areas which is equal to the distance to which edge effects are known or likely to penetrate;
 - (f) adequately managing and treating stormwater run-off from the site to control nutrient and sediment loads and outlet velocities;
 - (g) locating any fire breaks or fuel reduction zones within the development site;
 - (h) seeking co-operative management/covenants with adjacent landowners to minimise threats or disturbances.
- (12) Minimise narrow corridor lengths and include nodes to reduce edge effects by -
- (a) existing corridors are often long, narrow linear features surrounded by land uses such as residential development. This pattern has a high edge to area ratio which increases the impact of edge disturbances.
 - (b) increase the likelihood of species successfully moving to larger, more suitable habitats within the network.



- (c) create nodes that retain selected habitat areas within the corridor that are wider than the corridor itself. Retaining or rehabilitating a corridor node may compensate for a relatively narrow corridor by providing staging points for fauna movement and a refuge from catastrophic disturbances such as fires and drought.

(13) Rehabilitate disturbed areas to -

- (a) enhance habitat values. Ecological corridors are subject to disturbances such as fire, weed invasion or clearing. They can be rehabilitated to enhance habitat values. This is especially important for currently degraded areas which have the potential to create ecological corridor links and nodes. These areas are identified as enhancement corridors and enhancement links on the Bushland Habitat Overlay Map.

4.9.2 Additional Measures for Marine Habitat and Bushland Habitat

- (1) The Habitat Protection Overlay requires that development in Marine Habitat and Bushland Habitat, identify, protect and maximise environmental values, habitat function and viability.
- (2) These outcomes are achieved by -
 - (a) Uses and other development, other than reconfiguration -
 - (i) incorporate and address the requirements of the basic standard of habitat protection;
 - (ii) incorporate and address the requirements for enhancement corridor;
 - (iii) undertakes an ecological assessment report as a component of the development;
 - (iv) replant native vegetation within any degraded bushland habitat or marine habitat within the lot or premises, by planting a minimum of one native plant per 5m² of bushland habitat or marine habitat with species selected from Schedule 10 - Vegetation Species list as being suitable to the location;
 - (v) is located within a development envelope that is of sufficient size to contain all expected uses and associated activities, including but not limited to -
 - a. buildings and structures,
 - b. infrastructure,
 - c. access and parking,
 - d. wastewater disposal,
 - e. domestic gardens and exotic lawns,
 - f. cut and fill batters,
 - g. domestic animal exercise or livestock areas,
 - h. operation of all motorised vehicles including motorcycles,
 - i. recreational areas;
 - (vi) does not generate noise within or at the edge of an habitat areas in excess of the standards for noise as a barrier to wildlife movement;
 - (vii) the vertical or horizontal illumination resulting from direct, reflected or other incidental light emanating from the development does not exceed standards for light as a barrier to wildlife movement at or above ground level outside the boundary of an development envelope, where one exists, or into bushland areas in other circumstances;
 - (b) Reconfiguration -
 - (i) incorporates and addresses the requirements of the basic standard of habitat protection;
 - (ii) incorporates and addresses the additional requirements for marine habitat and bushland habitat listed above;
 - (iii) undertakes an ecological assessment report as a component of the development;
 - (iv) plants within the road reserve, a minimum of five trees or shrubs per lot created that are native species selected from Schedule 9 - Street Trees as being suitable to the location.



4.9.3 Additional Measures for Koala Habitat

- (1) The Koala Habitat outcomes focus on koala habitat trees and aim to achieve three main outcomes where a development is proposed -
 - (a) retention of koala habitat trees to the extent practicable;
 - (b) ensuring that adequate buffers are in place between retained koala habitat trees and development;
 - (c) ensuring that where koala habitat trees are removed, they are replaced such that there is no net loss of koala habitat trees.
- (2) The requirement for retention of koala habitat trees seeks to ensure, as far as is practicable, that koala habitat trees are not removed as a consequence of development at the site.
- (3) Koala habitat trees are -
 - (a) trees of the general Eucalyptus, Corymbia, Angophora, or Lophostemon greater than 4 metres in height or with a diameter greater than 10 centimetres at 1.3 metres above ground (as defined in the State Government's SEQ Regional Plan 2005-20016 - Interim Guidelines: Koalas and Development); or
 - (b) other trees, including non-native species, greater than 4 metres in height or with a diameter greater than 10 centimetres at 1.3 metres above ground, that offer refuge or habitat to koalas.
- (4) Buffers for koala habitat trees ensure -
 - (a) as far as is practicable, the ongoing viability of koala habitat trees retained on a development site;
 - (b) access, utility infrastructure, buildings or structures, including foundations -
 - (i) do not encroach on the root zone in a manner that jeopardises the long-term viability of the tree; or
 - (ii) do not encroach on the area around the trunk to a distance of no less than the drip line of the mature canopy in a manner that jeopardises the long-term viability of the tree; or
 - (iii) embrace and include the individual koala habitat tree(s) in design and siting in a manner that ensures the long term viability of the tree;
 - (iv) on a lot or premises greater than 2500 square metres, where bushfire hazard is assessed and shown as High or Medium on the Bushfire Hazard Overlay Map, a minimum setback of 1.5 times the predominant mature canopy height of koala habitat trees is required.
- (5) No net loss of koala habitat trees ensure -
 - (a) to maintain, at least the current number of habitat trees available to koalas within the Koala Habitat categories;
 - (b) if a development results in the removal of koala habitat trees, the no net loss requirement is achieved by -
 - (i) control over works on-site and off-site, noise and lighting, access over/under barriers, during construction such as wire on barriers to act as a ladder;
 - (ii) replanting to replace the koala habitat trees removed -
 - a. at the rate of one tree for every one metre in height of tree lost, by way of example, a 30 metre high tree would be replaced with 30 trees and each tree is replaced with a minimum of 4 trees replanted since koala habitat trees are by definition greater than four metres in height;
 - b. in accordance with requirements for successful replanting and after planting care and management, for a minimum of 18 months. Refer to section 4.10 - Replanting and Ecological Enhancement;
 - (iii) financial contribution to cover the cost of establishment and follow-up management for a minimum of 18 months at the rate of one unit for every metre of tree removed;
 - (c) the financial value of the unit is established by the local government;
 - (d) the financial contribution is made;



- (i) toward a Habitat Off-Set Scheme under the auspices of the local government;
- (ii) toward the Environment Charge Fund under the auspices of the local government;
- (iii) toward a replanting scheme or schedule acceptable to the local government.

4.10 Ecological Enhancement

- (1) The Planning Scheme requires that development enhance ecological values, ecological features, ecological processes and habitat -as outlined above - under the Habitat Protection Overlay.
- (2) There are additional requirements for enhancement in minor and major waterway buffers under the Waterways, Wetlands and Moreton Bay.

Note -

Waterway buffers described on the Waterways, Wetlands and Moreton Bay Overlay map are co-incident with many of the categories described on the Bushland Habitat Overlay Map, in particular the Enhancement Corridors and Bushland Habitat.

4.9.4 Objectives of Ecological Enhancement

- (1) The primary objectives of ecological enhancement under the Habitat Protection Overlay are to -
 - (a) create habitat for the benefit of native plants and animals by -
 - (i) increasing the extent of existing bushland areas;
 - (ii) increasing the terrestrial and aquatic habitat opportunities available in bushland areas;
 - (b) create or improve existing movement pathways for native animals between habitat areas;
 - (c) introduce management and carry out works to improve the ecological condition or ecological processes in degraded and threatened areas;
 - (d) introduce management, carry out works, or undertake actions that target recovery of significant species, and in particular those that are listed as vulnerable, rare or endangered.

Note -

The objectives of ecological enhancement are generalised to cover many species of fauna and flora present or potentially present at a site. Given the great variety of fauna and flora and the state of knowledge about their habitat requirements, it is impossible to reliably address all needs.

- (2) The primary objectives have many possible practical solutions. Listed below are the requirements for the most commonly employed solutions and techniques. The list is not exhaustive and may be amended by advances in knowledge and research and generally accepted best practice techniques.
- (3) Create habitat by -
 - (a) revegetation with appropriate local species including -
 - (i) replanting of native vegetation;
 - (ii) regeneration of native vegetation;
 - (b) topsoil management;
 - (c) translocation of flora and fauna;
 - (d) retaining diverse habitat features;
 - (e) creation or enhancement of waterways, dams and wetlands.
- (4) Create or improve existing movement pathways for native animals by -
 - (a) remove impediments to movements of native animals across the landscape;
 - (b) address wildlife crossing in the design of roads and access;
 - (c) directing native animals away from threats;
 - (d) using fauna friendly fences;



- (e) overcoming lighting as a barrier to movement;
 - (f) overcoming noise as a barrier to movement;
 - (g) creation or enhancement of waterways and wetlands.
- (5) Improve the ecological condition or ecological processes in degraded and threatened areas by-
- (a) site clean up, removal and management of rubbish, wastes, and pollutants;
 - (b) managing domestic pets and stock;
 - (c) removing pest animals;
 - (d) removing pest plants and weeds;
 - (e) stabilising active erosion, in particular that associated with natural drainage lines and waterways;
 - (f) Improving natural water flows, restoring natural watercourse processes, or restoring natural flushing action to waterways.
- (6) Recovery actions or management to address significant species in accordance with species recovery plans, conservation plans.
- (7) The objectives are implemented through the ecological assessment reports and development.

Note -

The requirements for this section are described in more detailed in following parts of this policy.

4.11 Revegetation with Locally Appropriate Native Plants

4.9.5 Specifications for Replanting of Native Vegetation

- (1) Replanting involves planting seedlings in the ground and active management to nurture them through the first few years until they are well established.
- (2) Regeneration involves active management to encourage regrowth of native plants from the seedbank and rootstock that exist in the soil.
- (3) In comparing the two methods -
 - (a) regeneration is usually far less expensive and provides established cover in a shorter period of time;
 - (b) regeneration can be harnessed to reduce, or sometimes replace the need to replant with seedlings, provided the resulting vegetation community grows more quickly or to a better standard than that which would have been achieved by planting of seedlings.
- (4) Species selection for replanting is to be in accordance with -
 - (a) the local vegetation association detailed in Redland Shire Council's *Vegetation Enhancement Strategy*, and on site observations. The *Vegetation Enhancement Strategy* can be obtained from the Council's web site at <http://www.redland.qld.gov.au> by entering "Vegetation Enhancement Strategy" in Search.
 - (b) site specific requirements at a level of detail not covered in the generalised approach in (a).
- (5) Planting requirements -
 - (a) the '*Revegetation Standard: Best Practise in Basic Revegetation Projects*' provides background and assistance with replanting projects and is available from the Council's Environmental Education Unit;
 - (b) unless otherwise required, the proportion of each vegetation layer among the numbers of plants used and species chosen is -
 - (i) 30 percent canopy (tree) layer;
 - (ii) 40 percent shrub layer;
 - (iii) 30 percent ground cover layer;



- (c) acceptable targets for rehabilitation are no less than 80 percent success rate following a comprehensive planting, monitoring and maintenance schedule;
 - (d) the cleared area are revegetated using locally native species;
 - (e) the plant density in revegetation areas should be at least 1 plant/4m² to simulate natural regeneration densities and provide a dense buffer;
 - (f) there may be additional species and plants regenerated through the soil seed bank and the seed found in the cleared, mulched material;
 - (g) plants should not be placed within 3 metres of property boundaries and kept a safe distance away from built structures, being minimum of ten metres;
 - (h) replanting is to accommodate the requirements of the wader birds, particularly in relation to their need for clear lines of sight;
 - (i) one fertilizer tablet should be placed in each planting hole at the time of planting. The plants should be watered in at planting and then followed up one week, 2 weeks, 3 weeks and then one month later depending on weather conditions.
- (6) After planting management requirements -
- (a) planted areas are mulched with existing material already available on-site, after shredding, before using mulch from another source. Stockpiled vegetation should be mulched on site and spread in the cleared area and along the perimeter of the area. Should additional mulch be required, it is recommended that the mulch be enhanced using forest mulch to a depth of 100mm, it should be free of exotic plant material such as camphor laurel and groundsel that could regenerate and invade cleared areas.
 - (b) weed management on site should be addressed in terms of declared and environmental weeds. Weed management must be ongoing throughout the monitoring and maintenance period. The weed management program is required to remove the weeds, stabilise the soil with mulch and subsequently replant using native species.
 - (c) a plant maintenance schedule is followed to assist in a successful revegetation program. Unless otherwise required, the following program for local government to inspect the revegetation is followed -
 - (i) after the initial planting stage;
 - (ii) six months after planting;
 - (iii) nine months after planting;
 - (iv) twelve months after planting;
 - (d) a performance bond is required to ensure compliance with the revegetation plan. The level of the bond is calculated to be the costs associated with reinstating the land if the local government were required to carry out the work and on going maintenance of the land. The life of the contract is twelve (12) months which commences once the initial planting inspection has been carried out and the performance bond has been lodged with the local government.
 - (e) half of the bond will be released six (6) months after the initial planting subject to an inspection by local government Environmental Planning Officers. A further amount will be released following the nine month inspection and the balance will be released following the final site inspection at twelve months and subject to the success of the revegetation works.

4.9.6 Specifications for Regeneration of Native Vegetation

- (1) Where the Habitat Protection Overlay, or other parts of the Planning Scheme require an ecological assessment report, this report will describe -
- (a) the regeneration that is occurring on the site;
 - (b) the vegetation communities that existed prior to disturbance;
 - (c) an analysis of the potential for regeneration of native plants from the seedbank and rootstock that exist in the soil;
 - (d) requirements for active management to encourage regeneration of native plants.



4.9.7 Specifications for Topsoil Management

- (1) Topsoil contains important seedbank and plant regeneration material that may be used for regeneration at low cost following its removal from construction areas.
- (2) Topsoil may be stockpiled on site and later spread in cleared, degraded or bare areas in accordance with the ecological assessment report, or as determined through site assessment, to encourage regeneration of native plants.

4.9.8 Specifications for Translocation of Flora and Fauna

- (1) For fauna management -
 - (a) at the operational works stage, and at least 14 days before commencement of any vegetation removal, dewatering or earthworks, the developer appoints an accredited wildlife spotter to examine the site for presence of fauna, and to supervise clearing operations;
 - (b) wildlife habitat includes trees whether living, dead or fallen, other living vegetation, piles of discarded vegetation, boulders, disturbed ground surfaces and aquatic feature such as dams and waterways;
 - (c) prior to the pre-start meeting, the spotter should provide the local government with a plan indicating the broad range of fauna expected on the site, the proposed method of operation, and any expected constraints;
 - (d) during clearing operations, the clearing contractor -
 - (i) liaises with the on-site spotter;
 - (ii) ensures that each tree or other feature identified by the spotter as being a risk to wildlife if felled, disturbed or dewatered, is not damaged or disturbed until the spotter advises that it is appropriate to do so;
 - (e) before commencement of and during clearing operations, it is the responsibility of the spotter to -
 - (i) be present at the site of clearing, dewatering, and other operations;
 - (ii) identify any tree or feature with wildlife present, as well as any tree that has a crown which is intermeshed or overlapping with such a tree;
 - (iii) advise the contractor of the precise location of each such tree or other feature;
 - (f) an accredited spotter is a person or company holding a current Rehabilitation Permit issued by the Environmental Protection Agency under Section 275(d) of the *Nature Conservation Regulation 1994*. All native fauna are protected under the *Nature Conservation Act 1992*;
 - (g) before seeking a pre-start meeting at the operational works stage, the applicant must provide a complete copy of the accredited spotter's current Rehabilitation Permit;
 - (h) operational works will not be permitted to commence until Council has sighted this permit;
 - (i) the spotter should attend the pre-start meeting if available;
 - (j) if the applicant cannot locate persons or companies holding Rehabilitation Permits, advice should be sought from Queensland Parks and Wildlife Service at Daisy Hill on 3299 1032.
- (2) Flora translocation -
 - (a) prior to any clearing of vegetation, those trees to be removed are usually tagged and approved by the local government to ensure minimal disturbance to the existing native vegetation;
 - (b) at this stage, the local government may also tag any significant understorey species identified in the ecological assessment report, or otherwise identified, for translocation prior to clearing operations commencing.



4.9.9 Specifications for Retaining Diverse Habitat Features

- (1) Habitat refers to a range of fauna and flora and may include a wide range of natural features that typically occur in natural bush, such as rocks, logs, uneven ground, understory shrubs and ground covers, overhangs, puddles, banks, gullies, sand bars, debris and log piles left by floodwaters. In general, it is important to retain these features in conservation, open space or covenant areas, and outside of building envelopes on allotments.
- (2) Where the Habitat Protection Overlay, or other parts of the Planning Scheme, require an ecological assessment report, this report will describe -
 - (a) the regeneration habitat features occurring on the site;
 - (b) requirements for retaining habitat features.

4.12 Creating or Improving Movement Pathways for Native Animals

4.9.10 Directing Native Animals Away from Threats

- (1) The design and siting of development -
 - (a) addresses the safe movement of native animals through the development site;
 - (b) directs native animals away from those parts of uses and development that potentially cause harm to them.
- (2) These threats may arise from a variety of sources including farming machinery, industrial machinery, swimming pools, guard dogs, road traffic, lighting, security fencing, domestic animals, noise and deep steep-sided drains.
- (3) The ecological assessment report shows how native animals will be protected from these threats including by -
 - (a) design that avoids native animals coming into contact with threats;
 - (b) design that provides ways for native animals to move safely away from the threats;
 - (c) design that modifies the threat so that its potential to harm is substantially reduced.

4.12.1 Design of Roads and Accessways to Address Wildlife Movements

- (1) In the Redland Shire design of roads that addresses the movement of macropods, koala or possums is considered (as a surrogate) to address all wildlife.
- (2) Specific design requirements in relation to existing roads include -
 - (a) addressing and incorporating the requirements of the *Draft Action Plan to Reduce Koala Hits from Vehicles in Redland Shire*, including -
 - (i) the general recommendations relating to road treatments for the precinct in which the development is located;
 - (ii) specific recommendations for road treatment by location in the precinct in which the development is located covering use of -
 - a. fauna exclusion fencing;
 - b. fauna “funnelling” fences or other structures;
 - c. underpasses;
 - d. culvert upgrades or retrofits;
 - e. proposed overpass structures;
 - f. proposed underpass structures;
 - g. lighting;
 - h. strategic treatment locations;



- i. structures which are designed to encourage use by target fauna which have inherent aversity to traversing particular environments. For example, various species will not cross open spaces, confined spaces, narrow spaces, lighted or dark spaces.
- (3) Specific design requirements in relation to new roads and access ways internal to developments include -
 - (a) applying the approach and recommendations the *Draft Action Plan to Reduce Koala Hits from Vehicles in Redland Shire*;
 - (b) applying the recommendations of *Fauna Sensitive Road Design Volume 1 Past and Existing Practices*, which is available from the Queensland Department of Main Roads, including use of the following measures -
 - (i) use of dry underpass passages of sufficient dimensions to accommodate wildlife (setback of bridge abutments from watercourses);
 - (ii) use of large pipe or small box culvert to accommodate fauna;
 - (iii) revegetation of the entrances to culverts to provide habitat close to culverts and cover for animals entering or exiting;
 - (iv) provision of refuge poles for koalas, possums and gliders entering or exiting;
 - (v) provision of wildlife fencing on both sides of roads to direct animals to culverts.

4.12.2 Fauna Friendly Fences

- (1) Fences are one of the major obstacles to fauna movement, especially where they are erected across habitat areas and corridors. Fences create physical barriers to fauna movement and have the potential to disrupt the feeding, migration, breeding and social patterns of fauna within that area.
- (2) The objective of fauna friendly fences is to meet the requirements for property boundary definition, security, privacy and the containment of livestock, in a manner that does not inhibit the movement of native animals between properties.
- (3) This objective may sometimes be achieved without building a fence. For example -
 - (a) Property Definition - A constructed fence may not be necessary to define a property boundary. Consideration should be given to garden edges or low wooden posts to subtly define boundaries exposed to the public. Where this is not possible, the old rural style fence of plain wire strands and wooden posts allows for the uninhibited movement of native fauna while defining boundaries;
 - (b) Privacy - The privacy of a property can be enhanced through the use of vegetation. A combination of native trees, shrubs and ground covers can effectively screen areas while enhancing the amenity and habitat value of the area. If the alignment of the property were such that privacy is a great concern, a more solid fence with a 30cm gap at the bottom would be considered Fauna Friendly;
 - (c) Existing fences - The movement of animals through existing fences can be improved by planting a variety of native trees and shrubs along the fence line, possibly either side of fence line as a continuous link, which fauna can use to climb over the fence until such time that a Fauna Friendly Fence can be erected. Sections of the fencing could also be removed, such as the lowest strand wire, and replanted to integrate the fence and vegetation. Alternatively if climbing animals are the prime consideration then poles or other structures attached to the fence can provide adequate grip for a native animal to climb over.
- (4) Given the vast variety in animal size, shape and methods of mobility, no single fence design can be classed as friendly to all fauna. A fence that is friendly to one species of native animal is not necessarily friendly to all. In the Redland Shire a fence is considered to be fauna friendly if it does not inhibit the movement of a macropods, koala or possums.
- (5) In urban areas outside of the Habitat Protection Overlay the Planning Scheme requires fences to be climbable by koalas. Where this is the case then the fence does not have to cater for all other native animals.
- (6) An ecological assessment report shows -



- (a) the location of existing fences, including existing fences on common boundaries with properties which are not the subject of the development application;
 - (b) where fences will be erected;
 - (c) where fauna friendly design is to be incorporated into fencing.
- (7) A fauna friendly fence is designed so that -
- (a) it has either -
 - (i) A 30cm gap between ground level and the first rail or strand, with spacing above this level is at the owner's discretion; or
 - (ii) A series of 30cm gaps between the rails or strands, with the first gap being no higher than 30cm above ground level; or
 - (iii) Box wire mesh, squares of no less than 10cm may be used provided that there is a 30cm gap between the ground level and the mesh, and provided the fence is not more than 1.2 metres in height;
 - (b) barbed wire is kept to a minimum and used only where essential for separation and management of stock. Where barbs are used consider short barbs and the use of bunting and reflective tags to increase visibility;
 - (c) electric fences are kept to a minimum and used only where essential for separation and management of stock.

4.12.3 Overcoming Noise as a Barrier to Wildlife Movement

- (1) Noise is a major obstacle to fauna movement. Noises, especially at night, have the potential to disrupt native animals during the feeding, migration, breeding and social interaction, all of which may have negative impact on the long term survival of species.
- (2) The objective is to minimise the noise directed into habitat areas or across movement pathways.
- (3) An ecological assessment report shows -
 - (a) areas where noise levels are an issue;
 - (b) the location of existing noise sources;
 - (c) the location of new potential noise sources;
 - (d) the location of noise measurement points;
 - (e) where design has incorporated noise abatement.
- (4) Development is designed so that it does not generate noise within or at the edge of an enhancement corridor, bushland habitat or marine habitat measured as the $L_{A \text{ max,adj. T}}$ parameter as defined in the *Noise Measurement Manual* (Environmental Protection Agency, 2000), of greater than -
 - (a) 5dB(A) above background noise level between 5am and 7pm;
 - (b) 3dB(A) above background noise level between 7pm and 5am.

Note -

Refer to Planning Scheme Policy 5 - Environmental Emissions in reference to implementing noise attenuation barriers, which states that barriers must not server movements of native animals

4.12.4 Overcoming Lighting as a Barrier to Wildlife Movement

- (1) Artificial lighting is a major obstacle to fauna movement. Artificial light, especially at night, has the potential to disrupt native animals during the feeding, migration, breeding and social interaction – all of which may have negative impact on the long term survival of species.
- (2) The objective is to minimise the artificial light directed into habitat areas or across movement pathways.
- (3) An ecological assessment report shows -



- (a) areas where light levels are an issue;
 - (b) the location of existing light sources;
 - (c) the location of new potential light sources;
 - (d) the location of light measurement points;
 - (e) where design has incorporated light abatement.
- (4) Development is designed so that the vertical or horizontal illumination resulting from direct, reflected or other incidental light emanating from the development does not exceed 8 lux when measured at any point 1.5 metres at or above ground level outside the boundary of a development envelope where one exists or into bushland areas in other circumstances.

4.13 Improve Ecological Condition or Processes in Degraded and Threatened Areas

4.12.5 Site Cleanup and Waste Management

- (1) Hazards and wastes are removed from the development site, with particular attention paid to the future public access areas, such as open space and conservation areas. This includes -
- (a) any wastes as defined in the *Environmental Protection Act 1994*;
 - (b) machinery, fencing, and equipment left over from past uses and practices, especially that from farming, nursery, horticultural, light industrial, mechanical and manufacturing activities;
 - (c) items of rubbish and litter.

4.12.6 Controlling Domestic Pets and Stock

- (1) The significant issue for management is to ensure that domestic pets, especially dogs and cats, and stock do not enter wildlife habitat areas, movement corridors and links. The Habitat Protection Overlay identifies the location of these wildlife areas.
- (2) It is important to realise that the presence of a dog or cat alone does not deter native fauna from entering a property and making what may be a fatal mistake in doing so. Similarly, pets will and do pursue native wildlife deep into habitat areas causing stress and predation.
- (3) The role of the ecological assessment report is to describe -
- (a) the critical boundaries between wildlife habitat, and movement corridors and residential, commercial or industrial areas, where pets are a significant risk to wildlife;
 - (b) where the design and siting of development has incorporated measures to control domestic pets and stock.
- (4) Development design and siting can protect native wildlife by -
- (a) confining pets, dogs and cats, to an area in the immediate vicinity of the house or within a development envelope;
 - (b) using fencing erected around the house or development envelope to provide room for dogs to move near the house for added safety and security, and allow fauna to move freely through the remainder of the property;
 - (c) using fauna proof fencing to separate dogs from other wildlife.

Note -

A fauna proof fence is for example a solid, vertical, 1800mm high fence, free of overhanging vegetation. Most fencing allows some fauna movement. Even chain wire allows small animals to move through and can be climbed by koalas.



4.12.7 Controlling Pest Animals

- (1) The ecological assessment report includes a fauna survey of the development site that records the presence of all animals listed as pests in the *Redland Shire Pest Management Plan*.
- (2) If there is clear evidence that a pest species identified on the site has a resident population that depends on the site for basic needs including but not restricted to shelter or food then the developer must with advice from the local governments Animal Management Unit take reasonable action to manage the pest population according to the control objective identified in the *Redland Shire Pest Management Plan*.
- (3) Where approvals for development could result in the potential for more dogs, the local government will seek to amend it's local laws relating to control of animals to exclude dogs from areas within H3 parts of sites covered by the Habitat Protection Overlay.
- (4) Where the lot contains or is adjacent a roosting site for wader birds, proposals for fencing to exclude dogs and stock from disturbing the wader birds.

4.12.8 Removing Weeds and Pest Plants

- (1) When developing a Pest Management Plan, it is essential for weeds and pest animals to be prioritised according to their declaration status, impact on the local environment, and the potential for success in the implementation of control measures. The LGAPMP should include objectives, key activities, and criteria for determining success.
- (2) Should also address -
 - (a) preventing the introduction or spread of pests;
 - (b) reducing the numbers or distribution of pests;
 - (c) managing adverse impacts of the pests;
 - (d) integrating management of the pests with other natural resource management activities;
 - (e) the ecological assessment report should also demonstrate how mulching and other activities to control weeds would not contain non-native seeds or plant parts that can germinate or grow.
- (3) All Contractors are required to manage the supply or transport of declared plant material to avoid spreading weeds. Contractors must ensure that reasonable steps are taken to prevent the spread of any declared weed via a contaminated vehicle, machinery and equipment. DNR&M wash down guidelines are available at: http://www.nrm.qld.gov.au/pests/weedseed/vehicle_machinery.html
- (4) The description of these weeds and the various methods for control can be found on the Queensland Government Department of Natural Resources and Mines Internet site at <http://www.nrm.qld.gov.au/...>
- (5) In addition, the local government's Land Management Team has a program of inspections of private land for weeds. This Team may be able to offer information about previous weeds found on the site and when weed control might best take place. They can be contacted on 3829 8588 or 3829 8625.

4.12.9 Stabilise Active Erosion

- (1) The requirements for rehabilitating areas affected by erosion are set out in the Planning Scheme Policy 14 - Waterways, Wetlands and Moreton Bay and include -
 - (a) re-profiling and stabilisation of the soil;
 - (b) follow up measures, such as replanting, use of geotextiles, rock gabion, to control erosive mechanisms;
 - (c) safeguards to minimise the ecological impacts of works, machinery, in drainage lines and waterways;
 - (d) within an enhancement corridor, marine habitat or bushland habitat, the rehabilitation is to include recreation of habitat including rills and riffles, snags, stream bed rocks and overhangs;
 - (e) on-going management of this to ensure successful rehabilitation of areas affected by erosion.



- (2) An ecological assessment report shows -
 - (a) areas where erosion is an issue;
 - (b) where design has incorporated management of erosion;
 - (c) the design and siting of rehabilitation and stabilization works.
- (3) The above requirements are general. Specific requirements for each development site are determined on a case by case basis.

4.14 Recovery of Significant Species

- (1) Where the Habitat Protection Overlay, or other parts of the Planning Scheme require an ecological assessment report, this report will describe -
 - (a) 'at risk', rare, vulnerable, endangered or significant species occurring on the site;
 - (b) any relevant species, ecosystem or fauna recovery, conservation or management plans or strategies;
 - (c) requirements for active management at the development site in accordance with these plans.

4.15 Bibliography

Remnant and Non Remnant Vegetation of Redland Shire, 2001, conducted by Land Assessment Management and Rehabilitation P/L and Land Resource Assessment and Management P/L

Biodiversity Assessment and Mapping Methodology, 2002, Environmental Protection Agency, Biodiversity Planning Unit, Version 2.1 July 2002.

Common Nature Conservation Classification System (CNCCS), 2001, Chenoweth Environmental Planning & Landscape Architecture P/L for Western Regional Organisation of Councils (WesROC), September 2001.

4.16 Glossary

Biodiversity	The variety of all life forms: the different plants, animals and micro-organisms, the genes they contain and the ecosystems they form. It is a concept that emphasises the inter-relatedness of the biological world. It is often considered at three levels: genetic diversity, species diversity and ecosystem diversity
Bioregion	Based on broad landscape patterns that reflect the major structural geologies and climate as well as major changes in floristic and faunistic assemblages
Conservation Status	The nature conservation ranking ascribed to a species or area of land (or its sub-components) under local, state or federal legislation or through recognised regional planning initiatives or through a recognised classification system
Diversity	The number (richness) of different flora and/or fauna communities or species occurring in a given area
Ecological Community	A group of flora and/or fauna populations interacting with each other in a systematic way
Ecological Connectivity	The extent to which land, water, airspace and/or vegetation is connected so as to facilitate the movement of fauna, flora, nutrients and energy
Ecological Corridor	An area of land and/or water, including areas above and below ground, which: functions to allow wildlife movement between habitat areas; provides wildlife refuges and habitat; provides habitat connectivity; supports the maintenance of biodiversity by providing connectivity; or supports the maintenance of ecological processes by providing connectivity
Ecological Feature	Any feature which forms a component of the ecology of an area
Ecological Processes	The physical and chemical processes which underpin the ecology of an area, including the hydrological and riparian processes of wetlands, waterways and coasts; the successional, plant dispersal, recruitment and fire regime processes of terrestrial and aquatic vegetation communities; soil formation, stabilisation, erosion and deposition; fauna and flora population dynamic
Ecological Quality (naturalness)	Extent to which an area of habitat supports the full range of native flora and/or fauna species known to occur in that habitat type
Ecological Representativeness	Extent to which a site (or its sub-components) contributes to the conservation of representative samples of the different flora and fauna habitats occurring on a local, regional or national scale
Ecosystem	A community of organisms interacting with one another and the environment in which they live
Ecotone	A region of transition between two plant communities, characterised by a transition between the floristic components of the communities (a floristic ecotone), and/or between the structures of the communities (a structural ecotone)
Edge Effects	Effects occurring at or near the boundary between different landscape or habitat types, including changed microclimatic conditions, increased exposure to wind and light (natural and artificial), changes in the water regime, increased predation, displacement of some species by more aggressive species including weeds, domestic animals and edge specialists, and changes in vegetation composition and/or structure reduction in habitat from lawns and other development-related buffer zones
Riparian (vegetation) Species	Vegetation situated on or associated with the banks of a waterway
Stag	A standing dead tree, often an emergent, above the surrounding vegetation canopy
Viability	The capacity of an ecosystem, flora or fauna community, species population or supporting ecological process (eg. energy, water or nutrient cycles) to persist in the long term without significant adverse change



Appendix 1 - Fauna Survey Needs

Fauna Group	Survey Technique	Survey Period	Survey Effort per Vegetation Community	
Mammals				
Small Terrestrial	Small mammal traps	All year	10 trap nights at 3-4 consecutive nights max	
	Hair tubes	All year	5-10 consecutive nights per site	
	Pitfall trappings	All year	5-10 consecutive nights per site	
Medium Terrestrial	Cage / B Elliot traps	All year	10 trap nights at 3-4 consecutive nights per habitat	
	Hair tubes	All year	5-10 consecutive nights per site	
Arboreal Mammals	B Elliot traps	All year	Trapping grid of 0.25ha sampling each major habitat, with 5 traps per grid opened for 3-4 consecutive nights	
	Faecal pellet counts	All year	Min of 1 plot per 1,000m ²	
	Playback of recorded calls	All year	Conducted after spotlighting	
	Spotlighting	All year	Walking rate 1km per hour	
	Hair tubes	All year	5-10 consecutive nights per site	
	Microchiropteran Bats	Harp traps	All year - limited in winter	2 harp traps per broad habitat type
Echolocation		All year - limited in winter	30 min continuous call	
Triplining		All year	2.5 hours - commencing at Dusk	
Mistnetting		All year	2.5 hours - commencing at Dusk	
Megachiropteran Bats		Spotlighting and listening	All year	Target spotlighting
		Camp count	All year	As necessary and having minimal impact on camp inhabitants
	Diurnal search	All year	As necessary and having minimal impact on camp inhabitants	
Birds				
Diurnal Birds	Formal census	For summer and winter minimum, optimal is seasonal	0.25ha sampling plot per 20 mins / habitat	
Nocturnal Birds	Formal Census	For summer and winter minimum, optimal is seasonal	One point census per 0.25ha	
	Playback of recorded calls	For summer and winter minimum, optimal is seasonal		
Reptiles				
Diurnal searches	Habitat searches	Summer and winter after rains	0.25ha search per hour on 2 separate days	
Nocturnal searches	Spotlight searches	Summer and winter after rains	Walking rate 1km per hour on 2 separate nights	
Specific habitats	Diurnal + Nocturnal searches	Summer and winter after rains	One hour diurnal / one hour nocturnal	
<i>Optional</i>	Pitfall trappings	Summer and winter after rains		
Amphibians				
Diurnal searches	Systematic searches	Sep-Mar	0.25ha per hour or per habitat	



Fauna Group	Survey Technique	Survey Period	Survey Effort per Vegetation Community
Nocturnal searches	Spotlight searches	Sep-Mar	30min on 2 separate nights
	Playback or recorded calls	Sep-Mar	Once of each separate night
	Specific habitat searches	Sep-Mar	20min per 50m of waterbody edge
<i>Optional</i>	Pitfall trappings	Sep-Mar	



Appendix 2 - Fauna and Flora List

The local government considers these environmental values to be of particular significance. These are plants that have been recorded in the local government area, but this list does not preclude other plants that may occur in Redlands that have not been recorded to date.

Table 1 - Rare, Vulnerable and Endangered Native Plants

Scientific Name	Common Name	Comments
Endangered Species		
<i>Corchorus cunninghamii</i>	Native jute or Cunninghams jute	One population Mt Cotton
<i>Endiandra flovdii</i> - could possibly occur here		No recording - occurs on rainforest edge Gold Coast hinterland
<i>Olearia hygrophilla</i>		NSI in sedge wetland
<i>Phaius australis</i>	A swamp orchid	NSI, Russell, Macleay Islands, in wetlands, isolated specimens at Hilliards Ck, Coochiemudlo Island
<i>Phaius bernavli</i>	Golden swamp orchid	Possible colour variant of <i>P australis</i> but still classified as distinct species - NSI only in wetlands
<i>Phaius tancarvilleae</i>	Swamp orchid	Possibly NSI but often incorrect identification of <i>P australis</i> P
Vulnerable Species		
<i>Acacia baueri</i> subsp <i>baueri</i>		Few specimens on NSI - waterlogged sands in coastal health
<i>Acacia fimbriata</i> var <i>perangusta</i>	Eprapah wattle	Once vulnerable now considered common. Common throughout Redland Shire along creeks and damp areas in open forest especially where disturbance has occurred
<i>Amorphospermum whitei</i>		Recorded Tingalpa Ck Mt Cotton could possibly occur here
<i>Caustis blakei</i> subsp <i>macrantha</i>	Foxtails	NSI in coastal health
<i>Halloragis exaltata</i>		Recorded Ormiston in open forest
<i>Macadamia integrifolia</i>	Macadamia nut	West Mt Cotton/Tingalpa Creek - few specimens only
<i>Macadamia tetraphylla</i>		Western and Southern slopes of Mt Cotton
<i>Thelypteris confluens</i>		NSI in wetland
Rare Species		
<i>Blandfordia grandiflora</i>		Russell Island, one specimen recorded Dunwich
<i>Durringtonia paludosa</i>		NSI - sedge wetlands
<i>Eucalyptus curtisii</i>	Brisbane mallee, Plunkett Mallee	Don and Christine Burnett Reserve
<i>Melaleuca tamariscina</i> subsp <i>irbyane</i>		No recordings although occurs on Tingalpa Ck at Ransome and Mt Cotton on Brisbane side of river. Unconfirmed recording in the past at Sheldon.
<i>Parastilochia praevenosa</i>		Recorded Mt Cotton



Table 2 - Rare, Vulnerable and Endangered Native Animals

Common Name	Scientific Name	NCA	EPBC
Endangered Species			
Grey-nurse shark	<i>Carcharias Taurus</i>	E	
Giant Barred Frog	<i>Mixophyes iteratus</i>	E	
Loggerhead Turtle	<i>Caretta caretta</i>	E	E
Leatherback Turtle	<i>Dermochelys coriacea</i>	E	V
Swift Parrot	<i>Lathamus discolor</i>	E	E
Southern Giant Petrel	<i>Macronectes giganteus</i>	E	E
Gould's petrel	<i>Pterodroma leucoptera</i>		E
Little Tern	<i>Sterna albifrons</i>	E	
Vulnerable Species			
Illidge's ant-blue	<i>Acrodipsas illidge</i>	V	
Richmond Birdwing Butterfly	<i>Ornithoptera richmondia</i>	V	
Pygmy Perch	<i>Nannoperca oxlevana</i>	V	E
Tusked Frog	<i>Adelotus brevis</i>	V	
Wallum Froglet	<i>Crinia tinnula</i>	V	
Wallum Rocketfrog	<i>Litonia freycineti</i>	V	
Wallum Sedgefrog	<i>Litonia olongburensis</i>	V	V
Green Turtle	<i>Chelonia mydas</i>	V	V
Flatback Turtle	<i>Natator depressus</i>	V	V
Black-breasted Button Quail	<i>Turnix melanogaster</i>	V	
Glossy Black-Cockatoo	<i>Calyptorhynchus latham</i>	V	
Wandering Albatross	<i>Diomedea exulans</i>	C-(s)	V
Beach Stone-curlew	<i>Esacus neglectus</i>	V	
Powerful owl	<i>Ninox strenua</i>	V	
Red-tailed Tropicbird	<i>Phaethon rubricauda</i>	V	
Sooty albatross	<i>Phoebastria fusca</i>		V
Kermadec Petrel	<i>Pterodroma neglecta</i>		V
Painted Snipe	<i>Rostratula benghalensis</i>	V	
Dugong	<i>Dugong dugon</i>	V	
Humpback Whale	<i>Megaptera novaeangliae</i>	V	V
Koala (SE Bioregion)	<i>Phascolarctos cinereus</i>	V	
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>		V
Water Mouse (False Water Rat)	<i>Xeromys myoides</i>	V	V
Rare Species			
Cooloola Sedgefrog	<i>Litonia cooloolensis</i>	R	
Green-thighed Frog	<i>Litonia brevipalmata</i>	R	
Common Death Adder	<i>Acanthophis antarcticus</i>	R	
Stephen's Banded Snake	<i>Hoplocephalus stephensii</i>	R	
Grey Goshawk	<i>Accipiter novaehollandiae</i>	R	
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>	R	
Sooty Oystercatcher	<i>Haematopus fuliginosus</i>	R	
Eastern Curlew	<i>Numenius madagascariensis</i>	R	
Lewin's Rail	<i>Rallus pectoralis</i>	R	
Freckled Duck	<i>Stictonetta naevosa</i>	R	
Sooty Owl	<i>Tyto tenebricosa</i>	R	
Grey Falcon	<i>Falco hypoleucos</i>	R	
Square-tailed Kite	<i>Lophoictinia isura</i>	R	
Indo-pacific Hump-backed Dolphin	<i>Sousa chinensis</i>	R	
Skink	<i>Ophioscincus truncatus</i>	R	



Table 3 - Shorebirds Recognised under Ramsar, CAMBA and JAMBA Agreements

Scientific Name	Common Name	Breeding Area	Habitat Preference in Australia
<i>Actitis hypoleucos</i>	Common Sandpiper	Western Europe, Eastern Russia	Wide Variety of inland and coastal wetlands - varying levels of salinity - muddy margins or rocky shores
<i>Arenaria interpres</i>	Ruddy Turnstone	Northern Siberia, Alaska	Wide variety of habitats - generally mudflats or rocky coastline - rarely inland waters
<i>Calidris Acuminata</i>	Sharp-tailed sandpiper	NE Siberia	Muddy edges of shallow fresh or brackish water. Common both on intertidal and inland waters
<i>Calidris alba</i>	Sanderling	High arctic regions - Alaska, Greenland, Russia	Mostly open sandy beaches
<i>Calidris canutus</i>	Red Knot	Nth Siberia, Alaska	Intertidal mudflats, sandflats, estuaries, sandy beaches of sheltered coasts
<i>Calidris ferruginea</i>	Curlew Sandpiper	Arctic Tundra	Intertidal mudflats of sheltered coastal areas, coastal lakes, estuaries, bays - occasionally inland wetlands
<i>Calidris melanotos</i>	Pectoral Sandpiper	N Russia, N America	Shallow fresh to saline wetlands usually coastal regions, but often inland
<i>Calidris ruficollis</i>	Red-necked Stint	N Siberia, Alaska	Mostly coastal sheltered inlets and estuaries with intertidal mudflats - occasionally on ocean beaches, commonly on inland lakes
<i>Calidris subminuta</i>	Long-toed Stint	Siberia	Terrestrial wetlands, shallow freshwater or brackish wetlands with muddy or vegetated shoreline
<i>Calidris tenuirostris</i>	Great Knot	N Siberia	Coastal habitats, intertidal mudflats, estuaries, lagoons and sandflats
<i>Charadrius bicinctus</i>	Double-banded plover	New Zealand	Littoral, estuarine and fresh or saline terrestrial wetlands, grasslands and pasture
<i>Charadrius leschenaultia</i>	Greater Sand Plover	Siberia	Coastal wetlands, intertidal mudflats or sandflats, sheltered sandy beaches
<i>Charadrius mongolus</i>	Lesser Sand Plover	Central and NE Asia	Usually coastal, estuaries and littoral environments - sandflats and mudflats
<i>Charadrius veredus</i>	Oriental Plover	Mongolia E China	Inland - grasslands, roost on beaches or muddy margins of terrestrial wetlands
<i>Gallinago hardwickii</i>	Latham's Snipe	Japan and adjacent parts of Siberia	Freshwater wetlands. Inland, upland and Coastal Plains. Soft moist ground or shallow flooded areas
<i>Gallinago megala</i>	Swinhoe's Snipe	Central Siberia, Mongolia	Freshwater wetlands, usually grass/sedge swamps or damp to wet grasslands
<i>Gallinago stenura</i>	Pin-tailed Snipe	Arctic Tundra	Freshwater wetlands, usually grass/sedge swamps or damp to wet grasslands
<i>Glareola maldivarum</i>	Oriental Pratincole	China, Pakistan and Indian subcontinent, Indonesia and Malay pens	Open country often near water, grassy flats and mudflats
<i>Heteroscelus brevipes</i>	Grey-tailed Tattler	Siberia	Sheltered coasts with reef or rock platforms or intertidal mudflats
<i>Heteroscelus incanus</i>	Wandering Tattler	Siberia, NW Canada	Rocky coasts - not commonly seen in Australia. East coast and islands
<i>Limicola falcinellus</i>	Broad-billed Sandpiper	Scandinavia, Russia	Sheltered coastal wetlands, mudflats, estuaries
<i>Limnodromus semipalmatus</i>	Asian Dowitcher	Siberia, N China, Russia, Mongolia	Usually intertidal sheltered coastal wetlands, mudflats, sandflats and estuaries
<i>Limosa lapponica</i>	Bar-tailed Godwit	Northern Russia, Scandinavia, NW Alaska	Mainly coastal, usually sheltered bays, estuaries and lagoons with large intertidal mudflats or sandflats



Scientific Name	Common Name	Breeding Area	Habitat Preference in Australia
<i>Limosa limosa</i>	Black-tailed Godwit	Iceland, N Atlantic, Europe, Russia and China	Mainly coastal, usually sheltered bays, estuaries and lagoons with large intertidal mudflats or sandflats. Often found inland in small numbers
<i>Numenius madagascariensis</i>	Eastern Curlew	Russia, NE China	Intertidal coastal mudflats, coastal lagoons, sandy spits
<i>Numenius minutes</i>	Little Curlew	Siberia	Coastal plains, grasslands, often recreational areas; may forage in dry habitat, but congregate at freshwater eg. Small numbers
<i>Numenius phaeopus</i>	Whimbrel	Siberia, Alaska	Intertidal coastal mudflats, river deltas and mangroves, occasionally sandy beaches
<i>Phalaropus lobatus</i>	Red-necked Phalarope	Arctic, sub Arctic, N America, Europe, Russia	Usually pelagic, occasionally coastal wetlands
<i>Philomachus pugnax</i>	Ruff	N Europe, Russia	Usually terrestrial wetlands with exposed mudflats at edges
<i>Pluvialis fulva</i>	Pacific Golden Plover	N Siberia, Alaska	Mainly coastal, beaches, mudflats and sandflats and other open areas such as recreational playing fields
<i>Pluvialis squatarola</i>	Grey Plover	Arctic tundras, Siberia, Alaska, Canada	Coastal, intertidal mudflats, sandflats, sandy beaches, rocky coastline
<i>Tringa glareola</i>	Wood Sandpiper	Eurasia, mostly Scandinavia, N China, Siberia	Freshwater wetlands
<i>Tringa nebularia</i>	Common Greenshank	Arctic circle, Siberia	Wide variety of inland and sheltered coastal wetlands – mudflats, saltmarshes, mangroves
<i>Tringa stagnatilis</i>	Marsh Sandpiper	Eastern Europe to Eastern Siberia	Coastal – Permanent or ephemeral wetlands of varying degrees of salinity, commonly inland
<i>Tringa tetanus</i>	Common Redshank	Western Europe	Rare but regular visitor. Not known to visit Australia in significant numbers (<200)
<i>Xenus cinereus</i>	Terek Sandpiper	Russia, Eastern Europe	Intertidal coastal – mainly saline mudflats, lagoons and sandbanks

Source: Draft Background Paper to the Wildlife Conservation Plan for Migratory Shorebirds 2005, Department of the Environment and Heritage, Commonwealth of Australia



Table 4 - Other Significant Native Plant Species in the Redland Shire

Scientific Name	Common Name	Comments
Locally Significant		
<i>Todea barbara</i>	King Fern	Isolated recording on NSI only
<i>Bulbophyllum minutissimum</i>		In mangrove areas no recent recordings – may be extinct in shire
<i>Calanthe triplicate</i>	Christmas orchid	Along creeks – no recent recording in Redlands
<i>Caleana major</i>	Flying duck orchid	Coastal heath Russell and NSI – very few recent recordings
<i>Dockrillia schoeninum</i>	Pencil orchid	Rainforest – possibly extinct in Redlands
<i>Dockrillia linguiforme</i>	Tick or tongue orchid	Rainforest and along creeks esp Tingalpa Ck – threatened due to collectors
<i>Erythrorchis cassythoides</i>	Small climbing orchid	Open forest in rotten logs
<i>Pseudovanilla foliata</i>	Giant Climbing orchid	Open forest on dead trees/logs NSI
<i>Thelymitra ixioides</i>	Dotted sun orchid	Sedge wetlands on NSI and Russell – threatened by loss of habitat
<i>Thelymitra nuda</i>	Scented sun orchid	Grasslands – loss of habitat – clearing of understorey
<i>Thelymitra pauciflora</i>	Slender sun orchid	Grasslands – loss of habitat – clearing of understorey
<i>Acacia myrtifolia</i>		Only known occurrence edge of Whistling kite Swamp – Russell Island – possibly on NSI
<i>Acacia hispidula</i>		Only in Days Rd area Redland Bay.
<i>Bauera capitata</i>		Edge of sedge wetlands – only one recording NSI in pine forest opposite Brown Lake
<i>Boronia saffrolifera</i>	Safrole boronia	Few plants on NSI
<i>Hakea actites</i>		Only in a couple of locations on NSI and Russell
<i>Melaleuca thymifolia</i>		Only a few specimens left in wetlands at Fisher St Thorneside, Coolnwynpin Cons Area and Russell Island
<i>Oxylobium aciculiferum</i>		Few specimens only at Sheldon near Summit St
<i>Platylobium formosum</i>	Flat pea	Historical recordings – now extinct in shire?
<i>Prostanthera ovalifolia</i>	Mint bush	Few specimens along Tingalpa Ck at Sheldon
<i>Pultenaea cunninghamii</i>		Historical recording – now extinct in Shire?
<i>Hibbertia dentata</i>		One recording – rainforest Mt Cotton
<i>Acacia bakeri</i>		One recording – Mt Cotton
<i>Acmena hemilampra</i>	Broad-leafed lilyilly	Uncommon in rainforest along some creeks in shire
<i>Acronychia imperforata</i>		Few specimens in littoral rainforest NSI, Macleay
<i>Acronychia pauciflora</i>	Few flowered aspen	Western and Southern slopes of Mt Cotton
<i>Ailanthus triphysa</i>	White bean	Western and Southern slopes of Mt Cotton
<i>Alectryon tomentosus</i>	Hairy birds eye	Western and Southern slopes of Mt Cotton
<i>Argyrodendron trifoliatum</i>	White booyong	Western and Southern slopes of Mt Cotton
<i>Arytera divaricate</i>	Coogera	Western and Southern slopes of Mt Cotton
<i>Arytera foveolata</i>	Pitted coogera	Western and Southern slopes of Mt Cotton
<i>Australorchis monophylla</i>	Lily of the valley	Western and Southern slopes of Mt Cotton
<i>Baloghia lucida</i>	Scrub bloodwood	Few specimens in Mt Cotton/Upper Tingalpa catchment
<i>Beilschmiedia elliptica</i>	Brown walnut	Few specimens in Mt Cotton/Upper Tingalpa catchment
<i>Beilschmiedia obtusifolia</i>	Hard bolly gum	Few specimens in Mt Cotton/Upper Tingalpa catchment
<i>Canthium coprosmoides</i>		Few specimens in Mt Cotton/Upper Tingalpa catchment
<i>Capparis arborea</i>	Native pomegranate	Few specimens in Mt Cotton/Upper Tingalpa catchment
<i>Capparis sarmentosa</i>	Scrambling caper	Western and Southern slopes of Mt Cotton
<i>Castanospermum australe</i>	Black bean	Few specimens in Mt Cotton/Upper Tingalpa catchment
<i>Cayratia eury nema</i>	Slender grape	Western and Southern slopes of Mt Cotton
<i>Clayoxylon australe</i>	Brittle wood	Few specimens in Mt Cotton/Upper Tingalpa catchment
<i>Cleistanthus cunninghamii</i>		Western and Southern slopes of Mt Cotton
<i>Clerodendron floribundum</i>	Lolly bush	Few specimens in Mt Cotton/Upper Tingalpa catchment
<i>Croton acronychioides</i>	Thick leafed croton	Western and Southern slopes of Mt Cotton
<i>Croton insulare</i>	Qld cascarilla bark	Few specimens in Mt Cotton/Upper Tingalpa catchment
<i>Cryptocarya glaucesens</i>	Jackwood	Few specimens in Mt Cotton/Upper Tingalpa catchment
<i>Cryptocarya obovata</i>		Few specimens in Mt Cotton/Upper Tingalpa catchment
<i>Cryptocarya macdonaldii</i>		Few specimens in Mt Cotton/Upper Tingalpa catchment
<i>Cryptocarya sclerophylla</i>	Totem pole tree	Western and Southern slopes of Mt Cotton
<i>Cryptocarya triplinervis</i>		Few specimens in Mt Cotton/Upper Tingalpa catchment
<i>Cupaniopsis parvifolia</i>	Small leafed tuckeroo	Western and Southern slopes of Mt Cotton
<i>Cyanthillium cinerium</i>		Western and Southern slopes of Mt Cotton



Scientific Name	Common Name	Comments
<i>Cyclophyllum coprosmoides</i>	Coastal canthium	Western and Southern slopes of Mt Cotton
<i>Cyclophyllum longipetalum</i>	Coastal coffee	Western and Southern slopes of Mt Cotton
<i>Diploglottis cunnighamii</i>	Native tamarind	Few specimens in Mt Cotton/Upper Tingalpa catchment
<i>Drypetes deplanchei</i>	Yellow tulip	Western and Southern slopes of Mt Cotton
<i>Dysoxylon rufum</i>		Few specimens in Mt Cotton/Upper Tingalpa catchment
<i>Elaeocarpus eumundi</i>		Tingalpa Creek
<i>Elaeocarpus grandis</i>	Blue quandong	Few specimens in Mt Cotton/Upper Tingalpa catchment
<i>Ellatostachys nervosa</i>		Few specimens in Mt Cotton/Upper Tingalpa catchment
<i>Endiandra discolour</i>	Rose walnut	Few specimens in Mt Cotton/Upper Tingalpa catchment
<i>Endiandra sieberi</i>	Corkwood	Few specimens at Clay Gully and possibly NSI
<i>Eucalyptus tessellaris</i>	Moreton Bay Ash	Few specimens at Victoria Point
<i>Euroschinus falcata</i>	Ribbonwood	Few specimens in Mt Cotton/Upper Tingalpa catchment
<i>Ficus virens</i>	White fig	2 specimens on top of Mt Cotton
<i>Flindersia schottiana</i>	Bumpy ash	Few specimens in Mt Cotton/Upper Tingalpa catchment
<i>Flindersia xanthostyla</i>	Yellow wood	Few specimens in Mt Cotton/Upper Tingalpa catchment
<i>Gossia bidwillii</i>	Python tree	Western and Southern slopes of Mt Cotton
<i>Gossia punctata</i>	Myrtle	Western and Southern slopes of Mt Cotton
<i>Gmelina leichardtii</i>	White beech	Few specimens along Tingalpa Ck
<i>Hippocrates barbata</i>	Knot vine	Western and Southern slopes of Mt Cotton
<i>Hymenosporum flavum</i>	Native frangipanni	Few specimens in Mt Cotton/Upper Tingalpa catchment
<i>Ixora beckeri</i>	Brown coffeewood	Western and Southern slopes of Mt Cotton
<i>Litsea leefeana</i>	Brown bolly gum	Few specimens in Mt Cotton/Upper Tingalpa catchment
<i>Litsea reticulata</i>	Bolly gum	Few specimens in Mt Cotton/Upper Tingalpa catchment
<i>Livistonia australis</i>	Cabbage tree palm	Few specimens NSI
<i>Mallotus discolor</i>		Few specimens in Mt Cotton/Upper Tingalpa catchment
<i>Morinda canthoides</i>	Morinda vine	Western and Southern slopes of Mt Cotton
<i>Pararchidendron pruinatum</i>	Snow wood	Western and Southern slopes of Mt Cotton
<i>Parsonia lanceolata</i>	Scrub silk pod vine	Western and Southern slopes of Mt Cotton
<i>Parsonia ventricosa</i>	Hairy silk pod vine	Western and Southern slopes of Mt Cotton
<i>Pipterus argenteus</i>	Native mulberry	Few specimens in Mt Cotton/Upper Tingalpa catchment
<i>Pittosporum multiflorum</i>	Orange thorn	Western and Southern slopes of Mt Cotton
<i>Polyalthia nitidissima</i>		Cow Bay, Macleay Island and Mt Cotton
<i>Polyscias murrayi</i>		Only one recording Mt Cotton
<i>Pouteria australis</i>	Black apple	Western and Southern slopes of Mt Cotton
<i>Pouteria myrsinifolia</i>	Hairy Coondoo	Western and Southern slopes of Mt Cotton
<i>Pouteria pohlmaniana</i>	Yellow boxwood	Western and Southern slopes of Mt Cotton
<i>Sarcomelicope simplicifolia</i>	Bauerella	Western and Southern slopes of Mt Cotton
<i>Schizomeria ovata</i>	White cherry	Few specimens in Mt Cotton/Upper Tingalpa catchment
<i>Sloana woolsii</i>	Yellow carrabeen	Few specimens in Mt Cotton/Upper Tingalpa catchment
<i>Sophora tomentosa</i>		One recording – Cow Bay, Macleay Island
<i>Sterculia quadrifida</i>	Peanut tree	Few specimens in Mt Cotton/Upper Tingalpa catchment
<i>Streblus brunonianus</i>	Whalebone tree	Western and Southern slopes of Mt Cotton
<i>Synoum glandulosum</i>	Scentless rosewood	Few specimens in Mt Cotton/Upper Tingalpa catchment
<i>Syzygium leuhmanii</i>	Small leafed lilypilly	Few specimens in Mt Cotton/Upper Tingalpa catchment
<i>Tinospora smilacina</i>	Tinospora	Western and Southern slopes of Mt Cotton
<i>Toechima tenax</i>		Few specimens in Mt Cotton/Upper Tingalpa catchment
<i>Xylomelum salicinum</i>	Woody pear	Few specimens on Russell and possibly NSI
Tidal Species		
<i>Aegiceras corniculatum</i>	River Mangrove	Protected under the Fisheries Act
<i>Avicennia marina var australasica</i>	Grey mangrove	Protected under the Fisheries Act
<i>Bruguiera gymnorhiza</i>	Orange mangrove	Protected under the Fisheries Act
<i>Ceriops tagal var australis</i>	Yellow mangrove	Protected under the Fisheries Act
<i>Exocoecaria agallocha</i>	Milky mangrove	Protected under the Fisheries Act
<i>Lumnitzera racemosa</i>	Black mangrove	Protected under the Fisheries Act
<i>Rhizophora stylosa</i>	Red mangrove	Protected under the Fisheries Act
<i>Sporobolus virginicus</i>	Saltwater couch	Protected under the Fisheries Act
<i>Casuarina glauca</i>	Swamp she-oak	Protected under the Fisheries Act when growing in tidal zones
<i>Hibiscus tileaceus</i>	Cotton tree	Protected under the Fisheries Act when growing in tidal zones



Scientific Name	Common Name	Comments
<i>Casuarina equisetifolia</i>	Coastal she-oak	Protected under the Fisheries Act when growing in tidal zones
<i>Melaleuca quinquenervia</i>	Broad-leafed paper bark	Protected under the Fisheries Act when growing in tidal zones
Endangered Plants not Recorded but Could Occur in Redlands		
<i>Endiandra floydii</i>		No recording but could possibly occur here as it occurs on rainforest edge Gold Coast hinterland
<i>Austromyrtus gonoclada</i>	Angle stemmed myrtle	No recording but could possibly occur here: 7 plants planted as part of recovery program
<i>Ricinocarpos speciosus</i>		No recording but could possibly occur here - occurs in wider region- damp areas open forest near rainforest
<i>Sophora fraseri</i>		No recording but could possibly occur here – widespread in region
<i>Zieria collina</i>		No recording but could possibly occur here – found Mt Tamborine in rainforest
<i>Gompholobium virgatum var emarginatum</i>		No recording but could possibly occur here – Only recorded in wallum at Noosa

Table 5 - Other Significant Native Animal Species in the Redland Shire

Common Name
Iconic Species and Species Groups
Golden Swamp Wallaby
Koala
Greater Glider
Magpie Geese
Glossy Black Cockatoo
Bush Stone Curlew
Flying Fox
Shorebirds
Wallum Froglet
Green Tree Frog
Dugong
Sea Turtles
Small Dasyurids
Wrens and Finches
Insectivorous Bats
Goannas



Appendix 3 - Redland Shire Environmental Inventory Stage 4

4.0 Conservation Management Areas (CMAs)

- (1) Large areas of Redland Shire have been identified in planning strategies for South East Queensland as containing bushland habitat of State, regional and local significance. These areas are a major recreational and environmental resource, important for vegetation, fauna, water supply and recreation within Redland Shire and South East Queensland. These planning strategies have been taken into consideration when applying a level of significance to Conservation Management Areas (CMAs). The CMAs have also had their local significance and habitat function taken into consideration, and all CMAs represent opportunities for focussing enhancement activities.
- (2) The geographic distribution of the CMA categories is illustrated in the Environmental Inventory Stage 4 map available at the Council website.
- (3) The CMA location codes are comprised of an alphabetical code (two letters - described below) and an individual numeric code (four numbers) which are unique identifiers and serve no other purpose.
- (4) For the purpose of the Inventory and its findings, the Shire has been categorised and mapped into various CMAs according to the importance of bushland and tidal areas for protection, management and enhancement purposes. Four broad categories of CMA (Priority, Major, General, Enhancement) which are further subdivided according to broad ecological function classifications (Habitat, Patch, Mosaic, Corridors, Links, Tidal, and Foreshore).

4.1 Priority CMAs

- (5) Priority CMAs include -
 - (a) bushland in natural or near natural condition that are considered of high conservation significance⁶;
 - (b) large tracts of continuous bushland with minimum disturbance;
 - (c) remnant vegetation, tidal, estuarine and freshwater wetlands on the mainland coast and associated waterways and the island environments of Moreton Bay;
 - (d) areas ecologically significant at a regional or subregional level;
 - (e) all remnant vegetation;
 - (f) all Ramsar wetland sites;
 - (g) all areas of State and Regional biodiversity significance;
 - (h) all areas of State and Regional Conservation Significance.
- (6) are further subdivided as -
 - (a) Priority Habitat (PH) - Large habitat areas of sufficient size and connectivity for a large proportion of ecological processes to be self sustaining, capable of withstanding disturbances and of buffering edge effects;
 - (b) Priority Corridors (PC) - Riparian corridors connecting areas of Priority Habitat and Priority Tidal and providing an essential corridor function for Redland Shire at a regional or subregional level;
 - (c) Priority Tidal (PT) - Contain significant tidal ecosystems of regional significance; support aquatic based flora and fauna communities; have a water quality maintenance function;
 - (d) Priority Patch (PP) - Bushland remnants or small patches of relatively intact natural vegetation of significant or threatened habitat; may also provide "buffer" areas;
 - (e) Priority Foreshore (PF) - Strips of vegetation along the foreshore that provide habitat and buffering, and that contain habitat of some regional, State or Federal significance.

⁶ As defined in the Remnant Bushland of South East Queensland in the 1990s (Catterall and Kingston, 1993); the Final Joint Regional Koala Habitat Project (Pahl, 1993); the Remnant Native Vegetation Mosaics of Lands Within Redland Shire (); the Regional Nature Conservation Strategy (2003).



4.2 Major CMAs

- (1) Major CMAs include -
- (a) large areas of dense mosaic bushland frequently interspersed by small patches of clearing;
 - (b) areas functioning as smaller bushland habitats, corridors, links and mosaic areas;
 - (c) areas of high conservation significance at a local level;
 - (d) areas adjacent, or in close proximity to, Priority Areas;
 - (e) semi-isolated remnants of moderate size and fragmentation.
- (2) Major CMAs are further subdivided as -
- (a) Major Habitat (MH) - Have one or more of the following attributes -
 - (i) significant habitat areas surrounded by residential or other land uses;
 - (ii) bushland connected by corridors to the overall green network or habitat areas or provide a buffering function to Priority Tidal areas;
 - (iii) bushland which provides a catchment management function upstream of Leslie Harrison Dam;
 - (iv) exhibit some minor disturbance however are large enough to maintain a good habitat function;
 - (b) Major Corridor (MC) - Have one or more of the following attributes -
 - (i) riverine corridor links along waterways providing a vital ecological link within Redland Shire;
 - (ii) corridors of vegetation that extend from Priority Habitats, and are therefore likely to act as corridors for species that use the Priority Habitat. The Major Corridor is a type of extension of that Priority Habitat, and are linked to the ecological function that the Priority Habitat is serving -
 - (c) Major Foreshore (MF) - Narrow strips of vegetation along the foreshore providing habitat and buffer function;
 - (d) Major Patch (MP) - Have one or more of the following attributes -
 - (i) patches of isolated/semi-isolated bushland close to Priority Areas and other Major Areas supporting significant species;
 - (ii) fragmented/clusters of habitat remnants;
 - (iii) through land management and rehabilitation can form part of an overall green network;
 - (iv) larger and less disturbed than General Patches;
 - (v) attached to MC or surrounded by EH/EC and often in close proximity to PT areas.
 - (e) Major Link (ML) -
 - (i) narrow strips of continual vegetation linking Priority Areas and Major Areas;
 - (f) Major Mosaic (MM) -
 - (i) areas where small remnants/habitats form a mosaic of native vegetation with disturbed areas usually adjacent to Priority Areas, Major Habitats, Major Patches, or upstream of Leslie Harrison Dam.

4.3 General CMAs

- (1) General CMAs which include -
- (a) smaller patches and strips of native vegetation that provide habitat niches, stepping stones and local corridors for fauna even though they may be highly disturbed;
 - (b) patches and strips significant at a local level;
 - (c) representative areas of vegetation associations formerly more widespread throughout the region;



- (d) much vegetation that is regarded as regrowth under the Common Nature Conservation Classification System.

Note -

Regrowth vegetation provides habitat for wildlife and habitat for other plants. The younger vegetation in regrowth provides long term replacement of older vegetation and contributes to the likely long term ecological viability of that area. Regrowth may also be the first of a series (or succession) of colonisation species that return to an area after disturbances regrowth can, with time and proper management, reach a state akin to that of remnant vegetation

- (2) General CMAs are further subdivided as -
 - (a) General Habitat (GH) -
 - (i) disturbed bushland/habitat areas which still have value; larger than Patches; located near MH, PH and Corridor areas;
 - (b) General Corridor (GC) - Have one or more of the following attributes -
 - (i) narrow, disturbed, fragmented native riparian vegetation along waterways;
 - (ii) vital linkage function;
 - (iii) small coastal and significant minor tributaries off MCs.
 - (c) General Patch (GP) - Have one or more of the following attributes -
 - (i) scattered bushland with local habitat and amenity value;
 - (ii) fragmented bushland with a habitat function;
 - (iii) poor connectivity with other areas, however, may be near MH and MP areas;
 - (iv) fragmented vegetation and vegetation linkages along the edges of road reserves or along elongated driveways that are situated close to the other more densely vegetated part of the Patch;
 - (v) have greater disturbance than MPs;
 - (d) General Links (GL) - Have one or more of the following attributes -
 - (i) small narrow vegetated links adjoining localised and/or isolated patches of bushland to other Major/General bushland tracts/corridors;
 - (ii) comprise trees and native plants that link through a series of properties to create a wildlife corridor running through many properties. Examples of this are most prevalent at Thorneside where several links exist at the rear of long residential properties where there are houses situated at the front of the properties;
 - (e) General Mosaic (GM) -
 - (i) Areas where small patches of native vegetation and individual trees form a mosaic of native vegetation with highly disturbed areas. Often interspersed with houses, sheds and roads. Together, the vegetation has a fragmented appearance from the ground or from the air, but on the whole forms a mosaic of native vegetation.

4.4 Enhancement CMAs

- (1) Enhancement CMAs include -
 - (a) Enhancement Corridors (EC) which include cleared or degraded areas -
 - (i) coincident with waterways that may be enhanced to create better wildlife corridors between habitats (i.e. General, Major and Priority areas) or waterway buffers and areas to allow for the changing course of waterways;
 - (ii) adjacent to foreshores with potential through rehabilitation to enhance and protect tidal wetland areas and coastal ecosystem;
 - (iii) where there may be individual trees or lines of trees which are a good focus for enhancement and may already exhibit limited corridor function;
 - (iv) that are a minimum of 100 metres in width.



- (v) opportunities for revegetating a creek/waterway/drainage line to extend an existing corridor to link Habitat and Patch areas;
 - (vi) substantially cleared or degraded, often containing individual trees or lines of trees;
 - (vii) opportunity for potential expansion or widening of existing corridors, such as along a wet drainage line, where the enhancement is best focussed on this existing vegetation to make the most of their existing and potential linkage function;
 - (viii) located along main and significant minor tributaries;
 - (ix) should be 100 metres wide, unless there is some form of existing barrier to this width that cannot be removed. Are wider than 100 metres where the Corridor encloses some structure that limits wildlife movement or replanting;
- (b) Enhancement Links (EL) which are -
- (i) indicative of a best fit for an ecological connection across cleared or degraded areas that may be enhanced to create movement pathways for wildlife between habitats, such as General, Major and Priority areas;
 - (ii) not coincident with waterways or adjacent to foreshores;
 - (iii) not necessarily inclusive of individual trees or lines of trees as a focus for enhancement and may not currently exhibit an ecological linkage or corridor function;
 - (iv) negotiable with regard to siting and design based on the findings of ecological assessment report;
 - (v) opportunities for replanting to link Habitat and Patch areas. These differ from Enhancement Corridors in that they do not run along creeks/waterways/drainage lines;
 - (vi) substantially or totally cleared or degraded areas, often containing individual trees or lines of trees;
 - (vii) opportunity for potential expansion or widening of an existing link;
 - (viii) often located along property boundaries between existing habitats;
 - (ix) should be 100 metres wide, unless there is some form of existing barrier to this width that cannot be removed. Are wider than 100 metres where the Link encloses some structure (e.g. a dam) that limits wildlife movement or replanting.
- (c) Enhancement Area (EA) which includes -
- (i) cleared non-urban areas representing opportunities to protect, enhance and maintain freedom of wildlife movements and for limited replanting;
 - (ii) areas primarily cleared of vegetation for a variety of land uses;
 - (iii) provide reasonable freedom of movement for wildlife to vegetation in other areas in comparison to that experienced by wildlife trying to move through urban allotments, or through shopping centres, or through industrial estates;
 - (iv) opportunity to ensure the long-term survival of native animal populations, such as koalas, is offered by avoiding further barriers to movements of native animals, and undertaking some replanting to improve movements of native animals;
- (d) Enhancement Foreshore (EF) which includes -
- (i) cleared or disturbed areas adjacent to foreshores with potential to be rehabilitated to enhance and protect the coastal ecosystem particularly tidal wetland areas;
 - (ii) should be at least 100 metres wide from the high tide, unless there is some form of existing barrier to this width that cannot be removed. Are wider than 100 metres where the Enhancement Foreshore encloses some structure that limits wildlife movement or replanting;
- (e) Enhancement Tidal (ET) which include -
- (i) cleared or degraded areas that are inundated by tidal waters, and representing opportunities for rehabilitation.



Appendix 4 - Ecological Assessment Certification Report

This certification is completed by suitably qualified or experienced persons as required by the Planning Scheme Policy No. 4 - Ecological Impact. It represents the minimum requirement for a Level One ecological assessment report and is not to be used for Level Two ecological assessment or Level One ecological assessment where a full report is required.

Development Site Location -

- **The proposed development site is located at -**

For example - Lot 3 RP 10356 111 to 112 Redland Center Road Thornlands.

- **The proposed development is described as -**

For example - Four metre by 12 metre shed located six metres from rear of dwelling on northeast side. Paths, water tank and driveway to shed.

Site Ecological Assessment -

- **I have inspected the development site and as far as practicable the adjoining lands and determined that in regard to the site and adjoining land -**

- **The landform and geographical features and land use are described as -**

For example - The site is gently sloping land falling from north to south and cut by a very minor drainage line running east west at the rear of the lot which is vegetated. The site is a recent park residential development lot located on past red soil horticultural land. The owner currently keeps three horses and two goats on the lot.

- **The vegetation is described as -**

For example - There are recent regrowth trees (*E. tereticornis*) located on the eastern boundary fence and exotic plantings near the current dwelling. The only other vegetation is along the minor drainage line at the rear of the lot in excess of 100 metres from the shed site. Shed site is grassed at present with no other vegetation within 10 metres of shed.

- **The habitat value and use of the site by fauna is described as -**

For example - Anecdotal information from the resident indicates that koalas periodically use the *E. tereticornis* for food. This is verified by old koala scratch marks on the trees and scats. Actual sightings were limited to a number of common species including rainbow lorikeets, crested pigeons, magpies, noisy miners and blue-faced honey eaters. A crested pigeon nest existed in the exotic plantings. No other nesting sites such as hollows were observed.

- **The following potential ecological impacts of the development proposal are identified -**

For example - The construction of the shed should not alter the ecological values of this site.

- **The following avoidance, mitigation and management measures have been included in the development proposal in relation to the above listed ecological impacts -**

For example - The siting of the shed has been done so as not to impact on the ecological values of the property.

- **The following measures are to be taken to enhance ecological values and processes at the site-**

For example - While there are no specific enhancement plans directly related to this application the continued ecological enhancement of the site as shown by the regenerating *E. tereticornis* will continue.

I (your name) of (your business address and contact details)

certify that the above information is complete, true and correct as at the date of this report.

My qualifications and experience for completing this assessment meet the relevant requirements of the Planning Scheme Policy 4 Ecological Impact and are attached.

Signed

Dated



Disclaimer: The above information may not constitute certainty about the ecological values of the site, as the composition, behaviour and range of fauna and flora can change with time and external influences. Observations were conducted during [season] at [times of day] over a period of [days, weeks].

(If considered relevant): The ecological values could alter from what was observed due to ... (for example, seasonal migration patterns, seasonal vegetation changes such as flowering or dieback, specified regular changes in the regional environment).



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