SC6.3 Biodiversity areas planning scheme policy

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1 Introduction

**1.1 Relationship to planning scheme**

This planning scheme policy:

1. provides information the Council may request for a development application;
2. provides guidance or advice about satisfying an assessment benchmark which identifies this planning scheme policy as providing that guidance or advice;
3. states a standard for the assessment benchmarks identified in the following table:

|  |  |  |
| --- | --- | --- |
| Column 1 – Section or table in the code | Column 2 – Assessment benchmark reference | Column 3 – Standard in the planning scheme policy |
| Biodiversity areas overlay code |
| Table 8.2.4.3.A | AO3 note | Section 2.3 |
| Table 8.2.4.3.A | AO4.2 | Sections 2 and 3 |
| Table 8.2.4.3.A | AO4.3 | Section 3 |
| Table 8.2.4.3.A | AO4.4 | Section 3.4 |
| Table 8.2.4.3.A | AO6.2 and AO6.3 | Sections 3 and 4 |
| Table 8.2.4.3.A | AO7.1 | Section 4 |
| Wetlands overlay code |
| Table 8.2.27.3 | AO1.2 note | Section 2 |

1.2 Purpose

This planning scheme policy provides the required information for a development application, and guidance and advice for assessment benchmarks for:

1. the undertaking of an ecological assessment and the preparation of an ecological assessment report, tree survey plan or vegetation management plan;
2. the achievement of the outcomes sought by the Biodiversity areas overlay code, Wetlands overlay code and the Subdivision code;
3. the protection, management and restoration of a network of biodiversity areas as depicted as High ecological significance sub-category, General ecological significance sub-category, Priority koala habitat area sub-category and Koala habitat area sub-category in the Biodiversity areas overlay map.

1.3 Elements of the Biodiversity areas overlay

The Biodiversity areas overlay map incorporates the city's most ecologically significant areas. The primary intent of the Biodiversity areas overlay map is to identify and protect a consolidated and connected network of habitats across the city. The protection and restoration of ecological corridors is a key priority within Brisbane.

Much of the land included within the Biodiversity areas overlay map supports intact, remnant habitat. However, some parts of the Biodiversity areas overlay map are currently degraded or cleared. Also, some areas within the Biodiversity areas overlay map have previously been developed for urban uses or are intended for urban uses in the future. Within areas that have already been developed, the Biodiversity areas overlay map mostly captures vegetation within open spaces, including backyards.

In order to achieve the connected and consolidated network of habitats identified in the Biodiversity areas overlay map, degraded areas will need to be restored and enhanced wherever possible. The restoration of land within the Biodiversity areas overlay map will provide the greatest benefit to biodiversity by reconnecting habitat areas that may previously have been fragmented.

There are some parts of the Biodiversity network which could never be restored to remnant bushland, either because existing development limits opportunities for restoration, or because issues such as flooding impacts on the type of habitat restoration that can occur. Fortunately, it is not necessary for the entirety of the Biodiversity network to be restored as remnant vegetation in order for it to function as useful habitat for many native species. Within Brisbane's highly urbanised environment, non-remnant vegetation (such as individual trees in parks or backyards) can still make a valuable contribution to habitat for more mobile native species, including koalas.

Even though some parts of the city's biodiversity network will never comprise remnant bushland, it is still important that they are protected and enhanced wherever possible to provide habitat in their own right and to ensure that safe linkages are provide for wildlife moving between habitat areas.

2 Ecological assessment and reporting

**2.1 Ecological assessment requirements**

1. The Biodiversity areas overlay code, Wetlands overlay code and Subdivision code may require that development be informed by an ecological assessment.
2. An ecological assessment is to incorporate a tree survey plan and tree schedule, which identifies all the trees on the development site.
3. A vegetation management plan which outlines how vegetation is to be managed before, during and after construction works on a site may also be required.
4. This planning scheme policy outlines the Council’s preferred methodology for completing an ecological assessment, tree survey and vegetation management plan.

2.1.1 Personnel undertaking an ecological assessment

1. The person preparing the ecological assessment report, undertaking the fieldwork or undertaking elements of the fieldwork is to have relevant tertiary qualifications in ecology, conservation biology or environmental planning, such as membership in the Environmental Institute of Australia and New Zealand (EIANZ). They should also have at least 5 years of experience in ecological surveys, assessment and reporting.
2. A wildlife survey is a scientific activity used to gather information on native and non-native species that provides information to quantify the biodiversity values and identify threats to biodiversity on a site. To undertake a wildlife survey a scientific permit is needed to trap, use or interfere with native animals for scientific and conservation purposes. Permits are obtained from the Queensland Department of Environment and Heritage Protection.

2.1.2 Methodology for undertaking an ecological assessment

1. Prior to any field survey work commencing, records are to be investigated to identify likely regional ecosystems, flora, and fauna species (including weed and pest animal species) which may occur on the site or on adjoining lands within a one kilometre radius of the site. Records to be investigated include:
2. research reports;
3. local knowledge (such as from local catchment and environment groups);
4. databases, such as the Council and Queensland Government regional ecosystem mapping, and flora and fauna records held by the Queensland Government (Wildnet), Queensland Museum and Queensland Herbarium;
5. published literature.
6. The field survey is to assess the presence or likely presence of ecological features, significant vegetation communities, and flora and fauna species (including weed and pest animal species) on the site. Specifically, it should:
7. incorporate coverage of all major habitat types on the site;
8. use survey techniques suited to a diversity of flora and fauna;
9. consider seasonal variations, survey duration and climatic conditions.
10. Ecological features and processes are essential to the conservation of biodiversity and the maintenance of ecosystem services. Some examples of ecological features and processes which need to be identified on or adjoining the site are:
11. areas that contain nationally and internationally important flora, fauna, ecological communities and heritage places as identified in the *Environment Protection and Biodiversity Conservation Act 1999*;
12. Ramsar sites as listed under the Convention on Wetlands of International Importance;
13. areas declared as Fish Habitat Areas under the *Fisheries Act 1994*;
14. areas prescribed under the *Nature Conservation Act 1992*, including areas subject to an Interim conservation order and areas subject to a conservation plan;
15. areas identified as having conservation significance under the *Coastal Protection and Management Act 1995*;
16. Significant vegetation communities, Significant flora species and Significant fauna species identified in the Biodiversity areas overlay code;
17. important habitat features or evidence of fauna species, which include but are not limited to trees supporting scratch marks and hollows, stags, scats, tracks and other traces, fruit and seed falls, fauna trails, fallen logs, termite mounds, ground diggings, rock outcrops, nests in banks and roost, nest and den trees;
18. areas that would be suitable for habitat restoration, consolidating any existing habitat on site or on adjoining sites.
19. To identify flora and vegetation communities, plot or transect-based survey methods are to be used when establishing a flora species inventory, weed survey, or searching for significant flora species. All vegetation communities, including wetlands and, within these, all microhabitats (such as dry gullies) are to be identified. The regional ecosystem type is to be classified and the age, structure, composition and condition of the vegetation is to be assessed. Plans and literature may also have flora and fauna records.
20. If the site is in a Priority koala habitat area sub-category or the Koala habitat area sub-category of the Biodiversity areas overlay, particular focus is to be given to identifying and documenting koala habitat trees.
21. For fauna surveys, a minimum of 4 days and 4 nights of survey time is recommended to minimise any sampling duration influences within any given sampling period. In circumstances where less sampling effort is proposed, appropriate justification is to be provided in the ecological assessment report. The biodiversity survey principles to be considered when undertaking a fauna survey include:
22. use a survey methodology which accounts for habitat diversity and species requirements;
23. design the survey to minimise factors which may reduce the quality of the survey results;
24. ensure data is collected in a consistent format;
25. undertake ecological investigations in accordance with best-practice research ethics.
26. Fauna data is to be supported by the start and end dates of the survey, coordinates of the survey location, scientific and common name of identified species and the location precision.
27. Particular focus is to be given to identifying and documenting the presence of koalas, evidence of use of the site by koalas, or previous reports of sightings of koalas on or adjacent to the site.
28. The biodiversity survey techniques for fauna listed in Table 1 includes explanatory notes which highlight survey design considerations such as survey duration and number of trap nights for a diversity of species (note that Table 1 is a guide only). Species-specific survey guidelines and a general Terrestrial Vertebrate Survey Guideline are available from the Queensland Government.
29. Identify any existing impacts or threatening processes to the ecological features, vegetation communities (regional ecosystems) and flora and fauna species on the site.
30. Outline the likely impacts of development on the ecological features and flora and fauna species. Examples of spatial and temporal impacts from development include:
31. loss or fragmentation of habitat;
32. decrease or change in structure, composition, complexity and connectivity of vegetation;
33. increased edge effects, such as noise and light;
34. earthworks and installation of infrastructure, such as retaining walls, paths, roads, stormwater treatment devices;
35. weed and pest animal invasion;
36. changes to fire risks and regimes;
37. changes to flow regimes, nutrients, sediment and pollutant loads;
38. barriers to safe wildlife movement such as roads or fences;
39. introduction of domestic animals.

Table 1—Survey techniques for fauna

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Technique | Mammals | Birds | Insectivorous bats | Fruit and blossom bats | Reptiles | Frogs | Fish | Invertebrates | Comments and guidelines |
| Diurnal survey | x | x |   |   | x |   | x |   | Birds (dawn chorus): slowly walk transect or plot, stopping for 5–10 minutes at start and end of transects. Minimum duration: 20 minutes/transect or plot. Complete surveys within 3 hours of sunrise. Stagger starting times.Reptiles: ground search throughout day to cover crepuscular and strictly diurnal species. Look under rocks, debris, etc. for a minimum of 1 hour (site dependent). |
| Spot-lighting | x | x | x | x | x | x |   |   | Start surveys at least 1 hour after sunset. Stagger sessions throughout evening.Minimum duration of survey should be 1 hour (site dependent). Do not spotlight soon after or during nocturnal voice playback using predator calls (e.g. owls) Do not use vehicles – search on foot. Minimise disturbance. Restrict globe strength to 30–50 watts.Use red or opaque filters once an animal has been detected.Limit survey team size to 2 persons per transect. |
| Arboreal trapping | x |   |   |   |   |   |   |   | Appropriate method for gliders. Survey design dependent on site characteristics. Set traps 5–7m above ground. Bait as for ground-based traps. Clear daily, at or before sunrise.Should only be used where absolutely necessary. |
| Pitfall traps | x |   |   |   | x | x |   | x | Typically use no fewer than five 20L buckets, 5m apart along each transect. Use drift fencing (30cm high) to direct animal movement toward traps with bottom of netting buried in ground.Bury buckets flush with the ground. Some debris (e.g. leaves, twigs) placed in bucket to provide shelter and protection for trapped fauna. Clear at sunrise, midday and sunset. |
| Elliott traps (types A and B), cage traps | x |   |   |   | x |   |   |   | Place traps at least 5m apart. Place cage and Elliott traps (Type B) at each end of transect.Bait typically with either rolled oats, peanut butter, honey and vanilla essence or with sweet potato soaked in linseed oil. Set traps late afternoon and check at or just before sunrise. |
| Alcohol pit falls |   |   |   |   |   |   |   | x | Particularly useful for surveying ant and soil invertebrate species.Small clear glass/plastic jars one- quarter filled with preserving alcohol. Bury jars so that rim is flush with ground. |
| Electronic bat detector |   |   |  |   |   |   |   |   | Specialised survey technique. Only to be undertaken by a suitably qualified/experienced person. Accurate ultrasonic call analysis is critical. Record ultrasonic calls by walking a transect and stopping to record calls or by remote recording at specific locations (e.g. stag trees). Duration dependent on bat activity (generally minimum 20 minutes). |
| Harp net |   |   | x | x |   |   |   |   | Specialised survey technique. Only to be undertaken by a suitably qualified/experienced person. Specialised netting set up in front of bat cave exit or in known flight path. Bats hit net and drop into trap below, then released after identification and assessment complete.Duration dependent on bat activity (generally minimum 20 minutes). |
| Voice playback/ call recording |   | x |   |   |   | x |   |   | Do not use this technique in conjunction with spotlighting with mammals and other prey species – especially after broadcasting predator calls (e.g. owls). Note that failure to attract an answering call to a recording does not prove absence of a species. |
| Nocturnal amphibian survey |   |   |   |   |   | x |   |   | Use a combination of spotlighting and voice playback/call recording techniques to identify frog species present.Best undertaken during or soon after heavy rainfall events.Avoid handling frogs – ensure frogs do not contact any chemicals (e.g. insect repellent) and use clean wet gloves and glass containers. Keep frogs moist and minimise habitat disturbance.Release all frogs in the same location where captured, immediately following identification. |
| Aquatic bait/ trap netting |   |   |   |   |   |   | x |   | Bait trap: bait with dried cat food and/or pilchards. Set for at least 15 minutes. Seine net and dip nets: survey as a minimum a 50m stretch of waterway within, upstream and downstream of the subject site with both seine and dip nets. Use dip nets for sampling weed beds and undercut banks.Electrofishing: use where netting is impractical. |
| Stag-watching | x | x |   |   |   |   |   |   | Complements spotlighting and arboreal trapping. Use for cryptic species and for forming accurate estimates of population densities or numbers. Observe known or suspected nest or retreat trees at dusk and record observed fauna movements. |
| Roadkill survey | x | x |   |   | x | x |   |   | For further information refer to the Queensland Government Fauna Sensitive Road Design Manual Volume 2: Preferred Practices (2010). |
| Hair tube | x |   |   |   |   |   |   |   | Typically consists of a 50mm diameter plastic pipe approximately 15–20 cm long, lined with 3 or more strips of double-sided tape. Bait as for Elliott traps. Traps are either open at both ends with bait in middle or sealed at one end. Tubes are to be secured to prevent trap movement. Hair samples trapped on the tape require expert identification.  |
| Scats  | x |   |   |   | x |   |   |   | Photographing the scat in situ (with a scale) is recommended for correct identification of the species. Scat samples can also be collected in a plastic bag for further analysis, as samples can also provide an indication of any species predated upon – through analysis of bone or hair/fur. Samples require expert identification. |
| Tracks  | x |  x |   |   | x |   |   |   | Photos of the tracks with a scale can be taken. Samples require expert identification. |

2.2 Preparation of an ecological assessment report

1. The ecological assessment report informs the design of the development layout and footprint and is to be completed prior to the development design and layout.
2. The level of detail contained within the ecological assessment report will vary, reflecting the nature of the development and site attributes. The report is to include the following:
3. A description of the methodology used to complete the assessment:
4. Provide a full description of the field survey methodology used and assumptions made.
5. Detail all background investigations undertaken including literature reviewed, and recognised specialists, authorities and local naturalists consulted or referenced.
6. Reports that rely primarily on desktop research with little or no field-based work are not acceptable.
7. Describe and map the ecological features and processes, vegetation communities and flora and fauna species of the site and adjacent lands:
8. Identify and detail ecological features and provide a map displaying the location and extent of the ecological features. This is referred to as an ecological features map. Appropriate photographs and figures will enable the identification and location of ecological features on the ground.
9. The Ecological Features map is also to include:
10. 1m contours for the existing site topography;
11. areas included in the High ecological significance sub-category, General ecological significance sub-category, Priority koala habitat area sub-category or Koala habitat area sub-category as shown on the Biodiversity areas overlay map;
12. location of waterway corridors as shown on the Waterway corridors overlay map;
13. location of wetlands as shown on the Wetlands overlay map;
14. existing buildings and infrastructure such as roads or sewer lines;
15. nature and extent of any vegetation protected under the *Vegetation Management Act 1999* or the Natural Assets Local Law 2003.
16. Describe key ecological processes occurring on the site and adjacent lands.
17. Include appropriate photographs, figures and maps that will enable the identification and location of ecological features on the ground.
18. Accurately map and describe the vegetation communities, (remnant and non-remnant vegetation) in the site and on adjacent lands, including those identified as a Significant vegetation communities (regional ecosystems) within Table 8.2.4.3.B of the Biodiversity areas overlay code. Include details such as age, structure, composition and condition of vegetation communities on the site and on adjacent lands.
19. Describe and map accurately the terrestrial and aquatic flora species and vegetation communities (including details such as age, structure, composition, condition, State/national significance and regional ecosystem status) in the site and on adjacent lands, including a list of flora and fauna species recorded during the survey. A table outlining the location and attributes of trees on the development site should also be provided.
20. Document and describe the presence of any flora species listed as threatened under Commonwealth or State legislation, or those identified as a Significant flora species within Table 8.2.4.3.C of the Biodiversity areas overlay code.
21. Provide any past flora and fauna records of the site and adjoining lands within a 1km radius of the site. Records include research reports, local knowledge and databases, such as Wildnet, Queensland Museum and Queensland Herbarium records.
22. Identify and show the location of any non-juvenile or juvenile koala habitat tree.
23. Identify terrestrial and aquatic fauna species present or likely to be present within the site and adjacent lands.
24. Prepare an appropriately scaled map identifying the location of key habitat features or evidence of fauna species, including trees supporting scratch marks and hollows, stags, fruit and seed falls, fauna trails, fallen logs, termite mounds, ground diggings, rock outcrops, nests in banks and roost, nest and den trees.
25. Document and describe the presence of any fauna species listed as threatened under Commonwealth or State legislation, or those identified as a Significant fauna species within Table 8.2.4.3.D of the Biodiversity areas overlay code.
26. Identify any evidence of use of the site by koalas and the suitability of the habitat on site for koalas.
27. Document potential development impacts on ecological features and processes including:
28. an outline of the proposed development:
29. nature of the land use;
30. the extent of the development footprint and details of the site layout;
31. development design including the number of storeys, location of any outdoor lighting, audio systems or other noise generating activities.
32. identification of the proposed hours of operation if non-residential including:
33. the number of people anticipated on site at various times during the day and night;
34. the number and type of vehicle movements anticipated on site during the ongoing operation phase.
35. for the construction phase, details of the sequence of any proposed vegetation clearing, type of construction machinery and proposed barriers to restrict site access to ecologically sensitive areas;
36. differentiation between the impacts likely to occur during the construction of the development versus those impacts resulting from the ongoing operation of the development;
37. details of potential spatial and temporal (short- and long-term) impacts from the development on flora and fauna species and vegetation communities, including consideration of the construction and operational phases of the development. Specifically discuss the likely consequences of the identified impacts for the site and adjacent lands.
38. Detail how the layout of the development avoids impacts to the ecological features and processes and significant flora and fauna species and outline the impact mitigation measures that will be undertaken to reduce the impacts to biodiversity by:
39. clearly demonstrating how the proposed mitigation strategies will enable the development to meet the nature conservation obligations as described in the relevant statutory planning mechanisms;
40. providing information about development designs to mitigate impacts to ecological features and processes detailed in section 3 of this planning scheme policy.

Note—Refer to section 5.1 of this planning scheme policy for an ecological assessment report checklist which provides further guidance to the requirements of an ecological assessment report.

2.3 Preparation of a tree survey plan

1. A tree survey involves identifying, assessing and surveying all trees on a site.
2. The tree survey plan comprises a map and a supporting table or report outlining the location (accurate to +/- 100mm) and other attributes of trees located on the site.
3. The person preparing the tree survey plan is to have relevant tertiary qualifications in ecology, conservation biology or environmental planning. They should have at least 5 years of experience in ecological surveys, assessment and reporting.
4. Where the development will result in any encroachment into tree protection zones of trees to be retained, the tree survey plan is to be supported by an Arborist Report prepared in accordance with Chapter 1 of the Infrastructure design planning scheme policy.

2.3.1 Information to be included in a tree survey plan

1. A tree survey plan provides a description of the site and the proposed works and is to incorporate the following information:
2. a scaled tree survey map overlaid on the development layout, identifying the location of:
3. individual trees, ensuring each tree is numbered and the area of the canopy spread is shown indicatively;
4. if in the Priority koala habitat area sub-category or Koala habitat area sub-category, koala habitat or food trees;
5. those trees proposed for retention;
6. those trees proposed for removal;
7. any tree protection zones, in accordance with AS 4970-2009 Protection of trees on development sites.
8. a table which includes:
9. the number for each tree identified on the tree survey map;
10. tree species (botanical and common names);
11. height;
12. diameter at breast height;
13. canopy spread (in square metres);
14. condition/health;
15. evidence of fauna use or habitat value including scratch marks, hollows, nests, termites and scats;
16. trees to be removed or tree protection zones to be impacted;
17. trees to be retained.
18. photographs of the site, key tree species and evidence of fauna use, where relevant;
19. any other supporting information provided by a qualified arborist.

2.4 Preparation of a vegetation management plan

1. A vegetation management plan describes the actions and processes which will be used to manage vegetation before, during and after construction on a site.
2. A vegetation management plan may be required as a condition of a development approval. In those circumstances, a vegetation management plan is required to be lodged before commencement of site works or any interference with vegetation.
3. The person preparing the vegetation management plan should be a qualified arborist or someone with relevant tertiary qualifications in ecology, conservation biology or botany with at least 5 years of experience in completing flora or tree surveys, assessing tree health and determining fauna habitat value of trees.

2.4.1 Information to be included in a vegetation management plan

1. A vegetation management plan is to comprise a plan of layout and supporting text.
2. The following are standard features of a plan of layout:
3. cadastral and property boundaries and dimensions, north point, scale and title adequate to interpret the plan;
4. layout of development, including existing and proposed alignments of services and infrastructure;
5. location and description of vegetation to be retained, cleared and restored, including drainage lines, waterway corridors, wetlands and other ecological features;
6. location of protective fences or other vegetation protection measures such as designated vehicle access, signage, tree guards and retaining clumps of trees for wind and storm protection;
7. contours (including areas for proposed filling and excavation);
8. location and type of erosion measures;
9. location of dedicated work areas including stockpile and disposal sites;
10. location of machinery access ways.
11. The supporting text is a critical component of a vegetation management plan and reports on the four main steps of vegetation management processes, namely:
12. project management;
13. vegetation protection;
14. clearing and disposal;
15. rehabilitation and maintenance.
16. Each step is presented in Table 2 with suggested approaches on how to achieve the aims and outcomes.

Table 2—Vegetation management plan preparation

|  |  |
| --- | --- |
| Key aims or outcomes | Suggested approach |
| A. Project management |
| 1. To formulate and implement vegetation management actions
2. To clearly identify objectives, methods and reporting lines
3. To inform all relevant people, companies and workers of their responsibilities
 | 1. Vegetation management plan to be prepared in conjunction with engineering requirements.
2. Vegetation management to be an integral part of the construction and operational phases.
3. Nominate a person with responsibility for overseeing development works (such as the site supervisor), a person responsible for implementing vegetation management plan actions on site, and a person for point-of-contact for the Council.
4. Instruct all workers and contractors as to their role in vegetation management.
5. Provide the method of assessing compliance with the vegetation management plan.
 |
| B. Vegetation protection |
| 1. To effectively protect vegetation during construction and operational phases
 | 1. Identify vegetation for removal and protection on a vegetation retention plan
2. Refer to appropriate Australian Standards e.g. AS 4970-2009 Protection of trees on development sites, and AS 4373-2007 Pruning of amenity trees
3. Implement vegetation protection measures during construction. These commonly include designated vehicle access ways, signage, protective barrier fences, silt fences, tree guards and dedicated work areas. Establish these measures prior to works commencing and maintain the measures throughout the construction phase.
4. Protect the tree protection zones of individual trees or clumps of trees from compaction, filling, stockpiling or excavation. Refer to AS 4970-2009 Protection of trees on development sites.
5. Identify a replacement formula for trees which are damaged.
 |
| C. Clearing and disposal |
| 1. To minimise the adverse impacts of vegetation clearance
2. To maximise recycling or re-use of cleared vegetation
3. To minimise the impacts on existing fauna
 | 1. Clearly identify and indicate on a plan the area of vegetation proposed to be cleared in relation to tree protection zones and structural root zones.
2. Use clearing methods that will not damage adjacent protected vegetation and that will minimise soil profile disturbance. Match the type of equipment to be used with the specific clearing task. There are many options available, including excavator-mounted hydraulic grabs etc.
3. Recycle cleared vegetation for re-use on or off site. Recycling techniques include mulching, tub-grinding, wood chipping and salvage. Do not recycle weed materials as this has potential to spread weed propagules.
4. Provide supporting documentation prepared by a suitably qualified arborist when work is proposed within the tree protection zone.
5. Clear vegetation sequentially to allow for natural retreat of fauna.
6. Employ a suitably qualified fauna spotter and a fauna catcher during the vegetation clearing and disposal phase of the project.
 |
| D. Rehabilitation and maintenance |
| 1. To restore and enhance areas in the post- construction phase
2. To maximise survival opportunities for areas of retained vegetation and newly rehabilitated areas
 | 1. Use species native to the site, including species known to provide food and habitat for native fauna.
2. Use a mix of species which replicate all strata in the nominated Regional Ecosystem that was originally on site pre-clearing.
3. Use species to augment the functioning of ecological corridors and nodes through the site.
4. Do not use plants that will compete with or displace existing local native species, or that have the potential to become new and emerging weed species.
5. Specify a maintenance program in the vegetation management plan to ensure the long-term health and vigour of retained vegetation and healthy growth of new plantings, including specified growth targets. Give details on mulching, watering and fertiliser regimes, regular inspection schedules for damage or disease, replacement planting criteria and weed control measures.

Note—The SEQ Ecological Restoration Framework (including manual and guidelines) provides detailed guidance on rehabilitation and restoration works.Editor's note—Brisbane Invasive Species Management Plan lists declared pests for the local government area under the *Land Protection (Pest and Stock Route Management) Act 2002*. |

Note—If the Biodiversity areas overlay code requires the delivery of environmental offsets, refer to the Biodiversity areas overlay code and Offsets planning scheme policy for more detail, including the reports required in support of an environmental offset proposal.

3 Development design

**3.1 Provisions for the Biodiversity areas overlay sub-categories**

Each sub-category of the Biodiversity areas overlay will require different development design outcomes. These are listed and described below:

1. High ecological significance sub-category requires conservation of ecological features and significant species, management of edge effects and habitat restoration.
2. General ecological significance sub-category requires conservation of ecological features and significant species and management of edge effects.

3.2 Development intrusion into Mapped Biodiversity Areas

Development intrusion into mapped areas of the High ecological significance sub-category or the General ecological significance sub-category, or clearing of koala habitat trees within the Priority koala habitat area sub-category or the Koala habitat area sub-category, is to be avoided. However, it is acknowledged that intrusion or vegetation clearing within areas mapped in the Biodiversity areas overlay may be unavoidable in some circumstances.

In order for a development intrusion into these mapped areas of the Biodiversity areas overlay or vegetation clearing of koala habitat to be considered ‘unavoidable’, an applicant is to demonstrate that a development proposal meets both of the following criteria:

1. An applicant will need to demonstrate that the locational requirements necessitate its location within an area mapped in the Biodiversity areas overlay. For example, a water supply reservoir has certain locational requirements insofar as it requires an elevated location. For land uses with few locational requirements, such as residential development, the applicant must comply with the assessment benchmarks if code assessable development. If impact assessable development the applicant is required to demonstrate that there are sufficient relevant matters (as defined in section 45(5) of the Act) to approve the development despite the conflict with the planning scheme; and
2. All practical development design mechanisms have been adopted to minimise development intrusion into mapped areas of the Biodiversity areas overlay or vegetation clearing. These may include consolidating the development footprint through bulking built form or increasing building height. Other development design mechanisms which can be adopted to reduce the development footprint and preserve in-situ or strategic biodiversity values include (but are not limited to):
3. Applying development envelopes and statutory environmental covenants to constrain the development footprint.
4. Locating and designing common property areas, public or private open space, gardens or landscaping areas so that they incorporate in-situ ecological features, such as significant flora species, habitat for significant fauna species and koala habitat trees, or optimise opportunities for reconnecting fragmented habitat patches.
5. Adopting sensitive architectural design, such as the use of pole houses to reduce impacts on topography or bushfire resistant buildings to reduce clearing for bushfire buffers.

Note—Refer to 3.3 Conservation of ecological features and significant species for further guidance on development design.

3.2.1 Where sufficient grounds are determined

Where development intrusion into an area mapped in the Biodiversity areas overlay or vegetation clearing is considered to be unavoidable, environmental offsets will apply in accordance with the *Environmental Offsets Act 2014*.

3.3 Conservation of ecological features and significant species

In the event an impact will occur, design management arrangements are implemented to mitigate these impacts. These management arrangements can be detailed through the preparation of management plans detailing the location, extent and nature of all measures designed to avoid, prevent, mitigate and/or manage the identified impacts on the site and on adjacent land within a defined radius.

Editor's note—The Council has developed Wildlife Conservation Action Statements for several of the significant flora and fauna species identified in Table 8.2.4.3.C and Table 8.2.4.3.D of the Biodiversity areas overlay code which may assist in the preparation of management plans for those species. These are available on Council's Threatened species website.

3.3.1 Ecological features and flora and fauna species

1. The retention of individuals or stands of significant flora species is to be pursued if their persistence in situ can be secured through appropriate development design, construction and operational measures. Measures are to respond appropriately to the biophysical and ecological requirements of the species in question, such as hydrology and ground levels.
2. The retention of native vegetation that is known or likely to support significant fauna species is to be pursued.
3. The identified habitat features or values of that native vegetation is to be secured in the long term through appropriate development design, construction and operational measures which may include, but are not limited to:
4. conserving the vegetation and habitat within a larger native vegetation patch with the smallest possible edge-to-area ratio to minimise edge effects;
5. conserving the patch in a tenure and location which will avoid further fragmentation or human disturbance, especially temporary or permanent disturbances within the tree protection zone;
6. maximising the size, consolidation and connectivity of areas to be conserved for biodiversity purposes on site and with adjoining sites;
7. adopting land management regimes which adequately respond to edge effects and other relevant threatening processes;
8. retaining or incorporating safe access for fauna to and from the native vegetation and nearby habitat patches;
9. adopting a layout or configuration that minimises distance and extent of inhospitable terrain between the subject native vegetation and nearby patches;
10. employing wildlife movement solutions within or external to the development to facilitate safe daily and seasonal movement of native fauna;
11. excluding filling and excavation from areas to be conserved for biodiversity, except if earthworks are associated with habitat restoration.
12. The principles and approaches outlined in this section are to be applied in the design, construction and delivery of a development.
13. Hollow-bearing trees, fallen logs and other ecological features are often critical to sustaining significant fauna species in the longer term. The retention or enhancement of these natural assets in situ is to be pursued wherever possible.

Note—Guidance on wildlife movement solutions is included in the Infrastructure design planning scheme policy.

**3.4 Management of edge effects**

1. Land uses adjoining the High ecological significance sub-category or General ecological significance sub-category are to provide a sensitive interface between development and areas of significant biodiversity value to reduce impacts associated with edge effects. This is particularly important in areas where major land use change is planned, including the Emerging community zone or Industry investigation zone, or where major centres or Growth Nodes on selected Transport Corridor intersect with the Biodiversity areas overlay.
2. Three types of edge effects are recognised, namely those which are abiotic, direct biological and indirect biological. Some of the major edge effects which degrade habitat areas or ecological corridors are summarised in Table 3.

Table 3—Summary of major edge effects

|  |  |
| --- | --- |
| Abiotic effects | Increased solar radiation |
| Increased wind and temperature |
| Decreased relative humidity |
| Increased or decreased nutrients |
| Changes in soil chemistry, such as water pollution |
| Modified hydrological regimes, that is, increase or decrease in flows  |
| Increased fire intensity or frequency |
| Introduction of rubbish |
| Increased pedestrian access resulting in greater disturbance |
| Changes to topography due to filling and excavation |
| Direct biological effects | Changes in vegetative structure and composition |
| Increased weed diversity and abundance |
| Indirect biological effects | Increased opportunistic aggressive fauna |
| Changes in animal behaviour |
| Increased predation |

1. Impacts from edge effects on ecological features and processes in or adjacent to the site are to be avoided or mitigated by best-practice planning and design measures which include, but are not limited, to:
2. retaining bushland habitat areas in a compact form, for example, roughly circular or rectangular, to minimise edge-to-area ratios;
3. consolidating areas to be conserved with vegetation and habitat on adjoining sites;
4. creating or retaining a buffer or separation area incorporating ecologically compatible activities adjacent to the habitat area, such as densely planted gardens, esplanade or perimeter road, water sensitive urban design infrastructure;
5. setting back residential, industrial, commercial or special purpose centre development;
6. adequately managing and treating stormwater run-off from the development site to control nutrient and sediment loads and outlet velocities;
7. locating any fire breaks or fuel reduction zones in a designated bushfire management zone;
8. seeking cooperative management arrangements with adjacent landowners to minimise threats or disturbances;
9. incorporating wildlife movement infrastructure and/or wildlife exclusion fencing to facilitate safe fauna movement through the landscape;
10. excluding filling and excavation works from areas to be protected for biodiversity purposes.
11. Development is also to be designed to locate noise-generating activities and operations away from areas to be protected for biodiversity purposes. To minimise light spillage, lighting is to be minimised, substituted with lower intensity emitting luminaires or screened to stop light spillage into areas of the High ecological significance sub-category.

3.5 Habitat restoration

1. The persistence and resilience of Brisbane's biodiversity is dependent on the protection and restoration of a connected and consolidated network of habitats across the city. In order to achieve this, restoration of cleared and degraded habitat is required in some areas.
2. Where habitat restoration works are required, they will be informed by a habitat restoration plan.
3. The restoration of cleared or degraded land is to recreate the regional ecosystem/s analogous with the restoration site pre-clearing or pre-disturbance. Direct seeding is not acceptable.
4. The incorporation of artificial nesting structures and ecological features should be used where relevant.
5. It is expected that best-practice habitat restoration techniques are used to maximise the chance of success. Any failed habitat restoration works may require rectification or replacement.

Note–The SEQ Ecological Restoration Framework has been developed as a regional standard for undertaking restoration projects. The framework can be accessed at the SEQ Catchments website.

4 Koala conservation

1. Under the *Queensland Nature Conservation Act 1992*, koalas are listed as 'regionally vulnerable' in South East Queensland. The following planning instruments, policies and guidelines protect koalas and their habitat:
2. the State Planning Policy;
3. State Government Supported Community Infrastructure - Koala Conservation Policy;
4. Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006-2016;
5. Koala-sensitive Design Guideline – A guide to koala-sensitive design measures for planning and development activities.
6. The above documents are available at http://www.ehp.qld.gov.au/wildlife/koalas/legislation/index.html.
7. On a national level, koala populations in Queensland are listed as vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999*. If a development proposal is likely to have a ‘significant impact’ on koalas, referral action to the Commonwealth Government should be undertaken to determine whether a 'significant impact' is likely .

4.1 Recognising koala habitat

1. Koala habitat is defined by the presence of a select group of food trees. Koalas are found in higher densities where food trees are growing on fertile soils and along watercourses. They do, however, occur in areas where their habitat has been partially cleared or degraded, including urban areas. These urban areas are still important for the survival of local koala populations.

4.2 Koala habitat and food trees

1. A koala habitat tree is a food tree or preferred shelter tree which is a Eucalyptus, Corymbia, Melaleuca, Lophostemon or Angophora species. Koalas will however use all available trees and shrubs for shelter.
2. Species recognised as preferred koala food trees within Brisbane include:
3. *Eucalyptus major*
4. *Eucalyptus microcorys*
5. *Eucalyptus moluccana*
6. *Eucalyptus propinqua*
7. *Eucalyptus racemosa*
8. *Eucalyptus resinifera*
9. *Eucalyptus robusta*
10. *Eucalyptus seeana*
11. *Eucalyptus tereticornis*.

4.3 Koala safety and movement

1. Within the Priority koala habitat area sub-category or the Koala habitat area sub-category, or areas of the High ecological significance sub-category or General ecological significance sub-category known to support koalas, koala safety and movement is to be considered during all stages of development including development design and layout, operational work, construction and ongoing operation.
2. Determination of the habitat connectivity values of a site are to consider the following:
3. if koalas are known or likely to occur in the vegetation communities found on the site;
4. if the site is part of or adjacent to the High ecological significance sub-category or General ecological significance sub-category;
5. the condition of the habitat;
6. any factors which diminish a site’s habitat connectivity value for koala movement, such as barriers to safe koala movement and dispersal.
7. Wildlife movement solutions which are well suited to facilitating the safe movement of koalas include:
8. land bridges;
9. cut-and-cover tunnels and culverts;
10. passage below a bridge;
11. local traffic management, including devices to reduce speed, the volume of traffic and increase awareness of koalas in the area, including pavement narrowing and rumble strips;
12. exclusion and barrier fencing to encourage koalas to move towards a safe crossing passage such as an overpass or dry cell culvert.
13. During the operational work and construction phase of development a range of measures are to be adopted to protect koalas. Measures include, but are not limited to:
14. avoiding operational activity such as heavy vehicle movement within, or to and from a site between the hours of 6pm and 6am;
15. native vegetation clearing undertaken sequentially under the guidance of a qualified koala spotter;
16. mitigating the effect of vegetation clearing on site through habitat restoration and rehabilitation;
17. fencing or barriers are designed to allow safe koala movement, and exclude koalas from unsafe areas or areas containing domestic dogs (where necessary);
18. avoiding the keeping of domestic dogs or security dogs on site, or providing security fencing to limit a dog to part of the site only.
19. For information on fencing designed to facilitate koala movement and other movement solutions, refer to the following:
20. Queensland Department of Environment and Heritage Protection’s Koala-sensitive Design Guideline - A guide to koala-sensitive design measures for planning and development activities;
21. Queensland Department of Transport and Main Road’s Fauna Sensitive Road Design Manual Volume 2.

Note–Guidance on wildlife movement solutions is included in the Infrastructure design planning scheme policy.

5 Checklists

5.1 Ecological assessment report checklist

The following checklist can be used to ensure that the broad tasks identified in this planning scheme policy have been completed before an ecological assessment report is submitted in support of a development application.

|  |  |
| --- | --- |
| Ecological assessment report tasks | Included |
| Description of methodology used |   |
| Identification and description of vegetation communitiesClassification of the type of regional ecosystem Assessment of the significance at a national, state, regional and city-wide level |   |
| Identification and description of fauna speciesAssessment of the significance of native species at a national, state, regional and city-wide levelAssessment of the species status under State legislation and the Brisbane Invasive Species Management Plan |   |
| Identification and description of flora speciesAssessment of the significance of native species at a national, state, regional and city-wide level.Assessment of the weed species status under State legislation and the Brisbane Invasive Species Management Plan |   |
| Identification and description of any wetlands and waterways and assessment of the significance of these features at a national, state, regional and city-wide level  |   |
| Identification and description of significant ecological featuresAssessment of the significance of these features under relevant legislation and associated planning documents |   |
| Creation of an ‘ecological features’ map |   |
| Identification of spatial and temporal ecological processes |   |
| Identification of edge effects and other disturbances |   |
| Description and mapping of the development against the ecological features map.  |   |
| Identification, documentation and mapping of spatial and temporal impacts to biodiversity |   |
| Documentation and mapping of strategies to mitigate biodiversity impacts |   |