

Guideline: State Development Assessment Provisions

State Code 25: Development in South East Queensland
koala habitat areas

EPP/2019/5155

Prepared by: Environmental Planning and Policy, Department of Environment and Science

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Version	Effective date	Description of changes
1.00	07/02/2020	

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February 2020

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1.0 Overview

Purpose and context

This guideline provides advice to assist address *State Code 25: Development in koala habitat areas* (the code) in the [State Development Assessment Provisions](https://planning.dsdmip.qld.gov.au/planning/better-development/the-development-assessment-process/the-states-role/state-development-assessment-provisions). (<https://planning.dsdmip.qld.gov.au/planning/better-development/the-development-assessment-process/the-states-role/state-development-assessment-provisions>).

This guideline applies to development in koala habitat areas made assessable under the Planning Regulation 2017. The use of this guideline does not guarantee compliance with all planning and environmental requirements of the code. Development applicants must refer and respond to the code.

Applicants should also refer to the [Koala-sensitive Design Guideline: A guide to koala-sensitive design measures for planning and development activities](#).

Note that the code applies to development that is proposing to clear koala habitat area outside of a Koala Priority Area. If development outside of a Koala Priority Area can avoid clearing koala habitat areas the development does not need State assessment.

Structure of this guideline

Section 2 provides key concepts relevant to the code. It provides technical detail relevant to one or more of the codes performance outcomes (PO). An application for development that triggers assessment against the code must consider the key concepts, how they relate to the proposed development and address the relevant key concepts when addressing the performance outcomes.

Section 3 provides the context for, and information on, how to respond to particular POs and specific information requirements. If a PO is not relevant to the proposed development, a response of “Not Applicable” and a statement saying why it is not relevant is required.¹

Section 4 provides links to technical documents and guidelines that have been used to develop this guideline as a reference to assist applicants prepare responses to the POs.

Note terms are not defined in this document. Please refer to the relevant instrument for definitions.

2.0 Key concepts

Koala ecology

Food requirements

The koala is an arboreal (tree living) marsupial that relies almost entirely on eucalyptus trees in a variety of different forest types. Koalas show marked preferences for a relatively small number of eucalypt species, particularly those occurring on more fertile soils with a higher nutrient status, as biophysical measures like soil type and water availability affects the palatability and nutrient level of the leaves. Koalas also prefer particular eucalyptus trees to other trees of the same species due to their palatability and use non-eucalypt species, such as *Corymbias*, *Lophostemons*, *Melaleucas* and *Angophoras*, as supplementary food or shelter trees.

Bushfire is a natural part of the ecology of Australian woodlands. While koalas need to be able to move away from habitat that has been burnt, they are one of the first animals to return to woodlands recovering from bushfire as they feed on the fresh spurt of leaves.

¹ If State assessment determines the PO is relevant, an information request to respond to the PO may be issued.

Shelter requirements

Koalas cannot thermoregulate their body temperature and need to move from food trees to shelter trees during the day to reduce their body temperature. Shelter trees are as important as food trees because koalas cannot eat if their body temperature is too high.

The location of food and shelter trees is important to consider when determining which koala habitat areas are more significant than others.

Breeding

Population growth in koalas is relatively low compared to other species. Female koalas generally start breeding at about three or four years of age. They can produce one offspring per year but on average breed every second year over the term of their reproductive lives.

The lifespan on koalas varies, with females living longer than males. On average females live for approximately 12 years. The average male lifespan is 10 years; but can be lower as they can get injured when fighting for territory. These figures are indicative of life expectancy in ideal habitat conditions with no, or a small number of introduced threats. Areas with poorer koala habitat conditions, less connectivity and greater threats reduce this lifespan. For example, the average survival rate for a dispersing sub-adult male living near a highway or a housing estate is closer to two or three years.

Koala home range and population habitat size

Koala home range

Koalas require suitable extents of habitat that provide sufficient opportunities for all components of a koala's life including feeding, seeking shelter and water, breeding, raising young and escaping threats such as predators. The area required to sustain a single koala depends on the quality of habitat and the extent to which it meets its habitat needs. Higher quality soils, such as alluvial soils, in areas with greater water availability generally produce higher quality habitat where trees are larger, have higher nutrient content, greater densities and greater canopy cover. Koalas have a smaller home range in areas with high quality habitat. As habitat quality reduces, less resources are available and the amount of area a koala needs for a home range increases. In South East Queensland, the smallest home range on highly fertile soils is one hectare for female koalas and two hectares for male koalas. Across the region, however, home ranges are often larger, particularly further west from the coast.

Koalas mark the extent of their home ranges with scents and scratching on trees. Typically, koalas will not move into the home range of another koala who has died for up to one year when scents and scratching have disappeared. If a single koala's home range is removed or reduced, the koala is often restricted in its ability to move to an adjacent area due to this area already being occupied and unable to support another individual.

Habitat size for koala populations

Stable breeding koala populations are made up of a matrix of male and female koalas with overlapping home range areas. The minimum patch size for viable koala population will depend, to some extent, on the level of koala habitat connectivity. For example, if several small patches of koala habitat areas are very close together they may function as a single larger patch if the koalas can move freely and safely between them. However, if a patch is highly isolated, then it would need to be much larger to support a viable population. Koala habitat areas that are less than 2ha in size, that are highly isolated due to distance, and highly modified by surrounding environments (e.g. urban development) are likely to be of little use as breeding habitat for koalas as this equates roughly to the smallest home range size for an individual koala in high quality habitat. Nonetheless, these areas may be important to assist connectivity as stepping stones.

Studies estimate that a minimum of 4,000ha of good quality habitat is required to support a viable breeding population of at least 500 individuals at a landscape level. When habitat quality is lower, more area is required to support the same number of individuals. If koala density is too high in a particular area it leaves them prone to higher levels of stress which can lead to greater risk of injury (e.g., fighting with other koalas) or disease.

A guide for habitat patch sizes is provided in Table 1.

Table 1: Guide for habitat patch sizes

Koala habitat area patch size	Habitat Use
≥ 50	Able to support a viable population of koalas. High priority to maintain extent of patch.
≥ 2 ha and < 50 ha	Medium priority for habitat, high priority for restoration and revegetation, high priority for connectivity.
< 2 ha	Not considered large enough to support a koala population but can function as a 'stepping stone' within a corridor.

Koala movement

Koalas will occasionally change trees during the day but are most active at night, dawn and dusk. Female koalas have been found to move about 100m each day while males move about 200m.

In the breeding season (August to January) koalas move more frequently as they shift from tree to tree in search of a mate. They often move greater distances outside of their usual home range to find a mate.

At around 18 - 36 months of age, between June and December, juvenile koalas establish their own home range. On average, they will travel 3.5 km from where they were raised. If there is no available habitat nearby, young koalas must travel much longer distances to find areas to establish themselves. This can be tens of kilometres in a highly modified environment.

Connectivity

Connectivity refers to the ability of plants or animals to move through a landscape. Higher levels of connectivity exist where there are fewer barriers to dispersal or migration. Maintaining safe and effective connectivity is important within and between patches of koala habitat to maintain viable koala populations. Connectivity is required for everyday movement of koalas, expanded movement at breeding, dispersal of sub-adults, opportunities to move from immediate threats such as bushfire and more gradual threats to habitat from climate change. Connectivity also provides for genetic exchange between populations to maintain genetic diversity and reduce inbreeding.

Koala movement is safer where there are no obstacles or cleared land within a koala's home range or between nearby habitat patches. The greater the distance a koala spends on the ground moving between habitat trees and/or the more barriers in its way, the higher the risk is of death or injury from exhaustion, lack of food and safe shelter, heat stress, dog attack, rival koala attacks or vehicle strike. Urban areas, major transport routes and large expanses of cleared land provide the greatest risk to connectivity.

Corridors are the clearest way to increase connectivity, as they provide structural connections between habitats in the landscape. There are other ways to increase connectivity where having a corridor is not possible, such as reducing the distance between koala habitat areas and retaining stepping stones.

Applying koala sensitive design principles in urban areas or across transport routes also assists connectivity. For further information refer to [Koala-sensitive Design Guideline: A guide to koala-sensitive design measures for planning and development activities](#).

Corridor

A corridor is an extent of vegetated or cleared unobstructed land that joins two or more larger areas of similar wildlife habitat. In order of preference and effectiveness, corridors can consist of:

1. koala habitat areas remaining intact and connected with continuous koala habitat areas;
2. continuous corridors of native vegetation with koala habitat trees between koala habitat areas;
3. continuous corridors of non-native vegetation with scattered koala habitat trees between koala habitat areas;
4. cleared land with small, segregated patches of vegetation with scattered koala habitat trees known as "stepping stones" between koala habitat areas;
5. cleared land that contains scattered koala habitat trees between koala habitat areas, ideally where the trees are 30m apart but no more than 200m apart and in small clumps to provide versatility to meet koalas habitat needs.

Corridors are generally defined at three levels:

- Regional (>500m wide) – primary connection at a landscape level connecting large koala habitat areas, enabling movement but also providing habitat in their own right (e.g. SEQ Regional Plan scale). Regional corridors are predominately in rural or conservation areas;
- Sub-regional (>300m wide) – wide enough to provide connections for koala movements and dispersal between koala habitat areas but may not provide substantial koala habitat in their own right. Typically, these corridors connect larger patches of native vegetation (e.g. >50ha). (e.g. local government area scale); Sub-regional corridors are generally in rural, conservation, rural residential areas. They may also be suitable in large urban subdivisions in greenfield locations, such as master planned communities.
- Local (<300m wide) – less defined linkage providing local connection (e.g. local suburb scale or lot scale). Local corridors are generally suitable for urban areas.

Adequate corridor width requires consideration of numerous factors, including the likely home range size of a koala based on the native vegetation type in that area, the length to width ratio of the corridor, topography and vegetation within the corridor and adjacent land use.

Stepping stones

Stepping stones are small patches of habitat where koalas can eat, rest and escape predators as they move between larger areas of habitat. Stepping stones can include small patches of koala habitat area (e.g. areas less than 2ha), patches of other vegetation that includes scattered koala habitat trees or a single koala habitat tree. Stepping stones within urbanised environments include parks, vegetated waterways, easements and road reserves with koala habitat trees. There may also be several stepping stones between large patches of koala habitat areas that facilitate koala movement over long distances.

Stepping stones must be as close as possible. In non-urban areas they should be a minimum of 100m from large koala habitat areas or other stepping stones as this is the average distance that a female koala will move in a day. In urban environments the distance between areas of refuge should be 30m or less to significantly reduce the risk of koalas becoming stressed and/or encountering threats from dogs and vehicles.

Stepping stones at much greater distances should not be discounted, as these have shown to be important for koalas, particularly young males dispersing long distances when establishing new home ranges.

Koala safe movement

Threats to the safe movement of koalas in urban areas, or between stepping stone habitat, increases with distance between habitat and the number of threats introduced. This affects a koala's ability to move safely from one patch of habitat to another. As landscapes become modified, native vegetation (including koala habitat areas) is replaced by barriers to koalas, such as urban development, roads, rail lines, fences and large expanses of cleared land. These barriers make it hard or impossible for koalas to move safely through the area. In existing or developing urban areas, or areas where road or rail is proposed, the safe movement of koalas and connectivity can be improved by using a range of koala-sensitive planning and design measures that aim to mitigate the risk to koalas.

Further information on this is provided in the [Koala-sensitive Design Guideline: A guide to koala-sensitive design measures for planning and development activities](#).

Koala Habitat Area

Koala habitat area means an area shown on the *Koala Conservation Plan Map* that the chief executive of the *Nature Conservation Act 1992* has determined to be a koala habitat area due to the combination of biophysical measures and suitable vegetation of the area. Koala habitat areas are those identified as containing koala habitat which is essential for the conservation of a viable koala population in the wild. The main purpose of identifying koala habitat areas is to avoid or minimise impacts on koala habitat to ensure the long-term persistence of koala populations in the wild.

Koala Habitat

Koala habitat is described in the *Nature Conservation (Koala) Conservation Plan 2017*. Koala habitat means:

- (a) an area of vegetation in which koalas live and that includes a koala habitat tree; or
- (b) an area of vegetation that consists primarily of koala habitat trees and which is reasonably suitable for sustaining koalas; or

(c) a partially or completely cleared area used by koalas to cross from an area mentioned in paragraph (a) or (b) to another area mentioned in paragraph (a) or (b) another such area.

No net loss

No net loss to koala habitat means that, on balance, the total extent of mapped koala habitat area remains, at a minimum, the same across SEQ. This goal does not prevent a greater extent of koala habitat area from being identified across South East Queensland in the future, but seeks to ensure there is no less. No net loss can be achieved by ensuring:

- loss, impacts and degradation to koala habitat areas are completely avoided; or
- loss, impacts and degradation to koala habitat areas are avoided to the greatest extent possible and where complete avoidance is not possible, minimised and mitigated to the greatest extent possible with any significant residual impact offset to fully counterbalance any loss (noting that an offset can only be provided in some instances).²

Note: The extent of koala habitat areas can be found on the [Development Assessment Mapping System](#).

3.0 Addressing SDAP State Code 25

This part of the guideline provides additional information to assist applicants demonstrate how they meet the POs and acceptable outcomes (AOs) of the code. The advice contained in this section covers the minimum information applicants are required to provide in response to the criteria.

Information supporting an application must be provided in document or map format described in the "Information requirements" sections. It must address the relevant considerations that is described in section 2.0 "Key Concepts" and section 3.0 "Intent of PO".

If the requirements are the same for more than one PO or AO, supporting information, such as survey reports and mapping, only needs to be provided once. Reports and maps must identify which PO's they are addressing.

Retaining koala habitat areas

Performance Outcomes PO1

<p>PO1 Development interfering with koala habitat (including interfering with koala habitat as a result of material change of use and interfering with koala habitat as a result of reconfiguring a lot) does not occur unless the application demonstrates the interfering with koala habitat has:</p> <ol style="list-style-type: none">1. been reasonably avoided; or2. been reasonably minimised where it cannot be reasonably avoided; and3. mitigated the impacts of the interfering with koala habitat values.	<p>No acceptable outcome is prescribed.</p>
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² Refer to the Queensland Environmental Offsets Policy. Chapter 2A of the policy relates specifically to koalas in SEQ.

Intent of PO1

Clearing koala habitat is a major threat leading to the species decline. It removes habitat, disrupts movement opportunities, displaces koalas and introduces threats. Retaining koala habitat is required to maintain viable populations in the wild.

The intent of PO1 is to ensure that development is sited, designed, constructed and/or operated so the entire extent of mapped koala habitat areas are retained on-site. If this is not possible, development is sited, designed, constructed and/or operated to minimise unavoidable clearing of koala habitat areas and that impacts on koala habitat values are mitigated. Clearing for development can only proceed if the application demonstrates that:

- alternative development options to retain koala habitat area have been considered but were not reasonably practicable;
- there is no alternative other than clearing koala habitat area for the development to occur (note that existing cleared areas provide alternatives to clearing koala habitat area);
- the minimum amount of koala habitat area will be cleared; and
- actions to mitigate impacts on koala habitat values that will be removed are included in the planning and design of the development.

Large scale developments, such as urban subdivisions over 20 lots or master planned communities, should locate koala habitat areas in conservation or open space areas to retain and protect habitat.

For all developments, clearing should be restricted to the areas of the site with the lowest koala habitat value or to the areas of the site that will have the least impact on resident and transient koalas. This may be parts of the site that have:

- the least number of koala habitat trees;
- a lower regional ecosystem condition (i.e. the regional ecosystem's habitat characteristics (as described in the [Regional Ecosystem Description Database \(https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/descriptions/download\)](https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/descriptions/download) and [Regional Ecosystem Technical Descriptions \(https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/technical-descriptions\)](https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/technical-descriptions)) have been lowered) (e.g. maintain remnant>high value regrowth>category x);
- no evidence of koala activity;
- less connectivity or more barriers limiting safe koala movement within the site and through the surrounding landscape; and/or
- the most extensive threats to resident and transient koalas.

Development should:

- locate activities (clearing, buildings, infrastructure) in existing cleared areas;
- use layouts, development sites, building types (e.g., multi-story rather than single storey) and smaller building footprints that result in no clearing, or the least amount of clearing, if clearing is required; and
- locate activities close to existing infrastructure, such as roads, power lines, sewerage and mains water, to minimise the distance to access this infrastructure and reduce the amount of clearing required to service development.

Reconfiguring a lot proposals should ensure new lots contain cleared areas suitable for subsequent development to avoid the need for future clearing, including for infrastructure and exempt clearing activities. Development envelopes should identify areas where clearing and future development will be confined to, in locations that will have the least impact on koala habitat areas and koala habitat values.

PO1 Information Requirements

General

All development applications must include the following information:

- a plan in digital (preferably GIS) format showing the location of:
 - koala habitat area on the development site and adjacent sites;

- the development footprint and infrastructure (e.g., roads, fences, water and power lines, stormwater) and any other activities or uses required for the development, including parks, playing fields and firebreaks;³
- koala habitat area proposed to be cleared;
- contour, drainage lines and native vegetation not identified as koala habitat area; and
- the location of koala habitat area on adjacent sites.

Applications must identify the amount (hectares) of koala habitat area proposed to be cleared.

Reconfiguring a lot applications should base this on the maximum possible extent of clearing, including clearing for future exempt activities. Extent of proposed clearing may also be based on any identified building envelopes that include building footprints, associated infrastructure, such as fences, roads, parking and utility lines and clearing for management, such as firebreaks.⁴

Demonstrate 'avoid and minimise'

Development applications must include a report prepared by a suitably qualified ecologist⁵ that describes alternative development options that have been investigated to avoid and minimise clearing koala habitat area. Reports must describe:

- the options that were considered to avoid or minimise clearing the koala habitat area;
- the amount of koala habitat area that would be cleared from each alternative development scenario;
- justification for why alternative options, including options that result in no/less clearing being undertaken or that result in lower development footprints or yields are not being used.

For reconfiguring a lot applications, the report should also show different lot layouts that were considered that would result in no, or less, koala habitat to be cleared, or areas with lower koala habitat values to be cleared. This includes scenarios that would result in less new lots being created or different lot configurations.

Applications should include a report that provides an assessment on the quality of koala habitat across the development site. The report must be prepared by a suitably qualified ecologist that identifies the methodology undertaken for the assessment and address the following:

- use or potential use of the site or parts of the site by koalas (e.g., koala survey, literature review (identifying preferred habitat types));
- the location of koala habitat trees that are being used by koalas (identified through site survey and supported by evidence of koala use (e.g., scats, scratches or koala sittings));
- the location of other koala habitat trees;
- existing and potential connectivity between koala habitat areas inside and outside the site; and
- waterways and drainage lines (retaining these may be essential to maintain the natural water table and local connectivity, which is important to the long-term survival of existing habitat).

Demonstrate 'mitigated impacts of clearing on koala habitat values'

If clearing occurs, applicants must demonstrate that the impacts of clearing on koalas, koala habitat areas and koala habitat values have been mitigated. Applications must include a report prepared by a suitably qualified ecologist that:

³ For reconfiguring a lot applications, identify building envelopes showing the location of the development footprint, infrastructure (e.g., roads, fences, water and power lines, stormwater) and any other uses required for the development including parks, playing fields and firebreaks.

⁴ Sufficient detail and information must be provided to ensure certainty in the development footprint of the development. If the amount of habitat to be cleared changes from what is conditioned (either more or less) applicants must apply for an amendment to review if the change will have a significant residual impact.

⁵ Someone with Degree qualifications in ecology or an equivalent discipline and experience in koala survey and ecology. A minimum Level 5 Arborist assessment/recommendations should form part of a consolidated report along with any assessment by an ecologist.

- identifies and quantifies the impacts the development will be having on koala habitat area/s and koalas using the area/s;
- identifies actions that will be undertaken to mitigate the impact of clearing on koala habitat areas and values; and
- quantifies how those actions will result in impacts being mitigated.

Mitigation measures may include:

- retaining koala habitat area in locations that will allow koalas to use and move through the site;
- retaining koala habitat area which have been identified through an ecological survey as being of higher use for koalas (e.g. retaining components of koala habitat areas with more records or other signs of koala use (i.e. scats or tree scratching) or areas that contain koala habitat trees preferred by koalas (e.g. blue gum));
- retaining particular koala habitat trees that koalas are using which have been identified through an ecological survey and ensuring that koalas can move safely between the koala habitat tree and other koala habitat areas;
- improving degraded koala habitat areas that are to be retained on the site by removing weeds and planting koala food trees endemic to the site (based on the sites regional ecosystem(s));
- minimising impacts on retained habitat and koalas using the area by:
 - providing a buffer between development and any retained koala habitat; and/or
 - managing edge effects on retained koala habitat including:
 - changes in soil condition, such as nutrients and erosion;
 - altered hydrological flow;
 - the introduction or increase of weed and exotic plant species;
 - disturbances to vegetation;
 - a modified fire regime;
 - the introduction of predators to koalas; and
 - increased light, noise or dust.

Mitigation activities should be undertaken on the lot(s) where the development is occurring. If this is not possible, they should be undertaken on land as close as possible to the location of the development. Lots that mitigation activities will be undertaken on will need to be included as part of the development application to demonstrate compliance with this requirement, even if no development is to be undertaken on the lot.

Applicants should also refer to the [Avoid and mitigate assessment checklist \(https://environment.des.qld.gov.au/assets/documents/pollution/management/offsets/avoid-and-mitigate-assessment-checklist.docx\)](https://environment.des.qld.gov.au/assets/documents/pollution/management/offsets/avoid-and-mitigate-assessment-checklist.docx).

Koala sensitive design and connectivity

Performance Outcomes PO2

PO2 The design and siting of development avoids fragmenting koala habitat areas within the site.	No acceptable outcome is prescribed.
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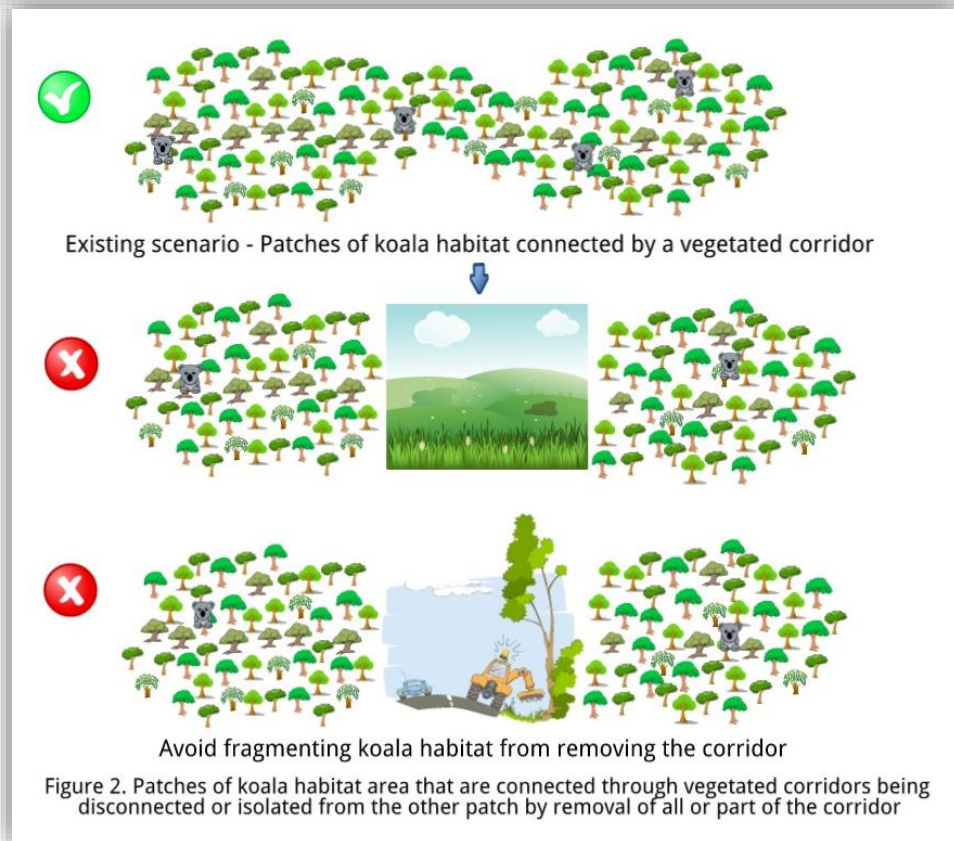
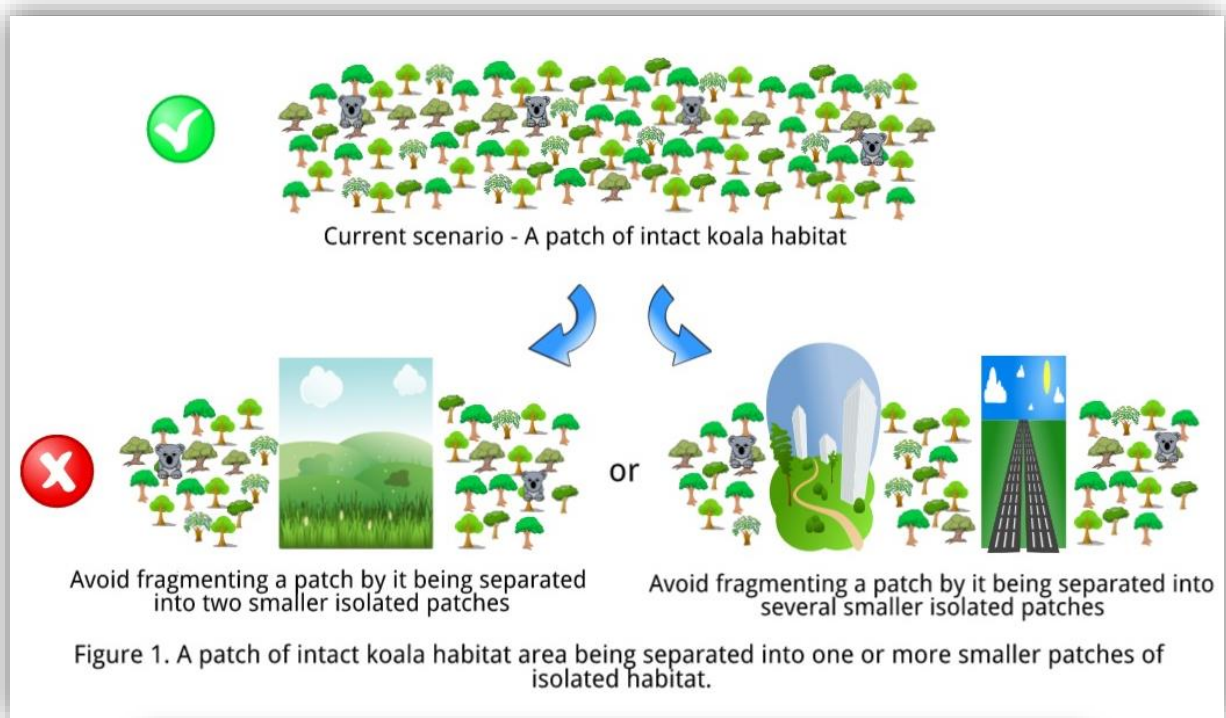
Intent of PO2

Sites that are vegetated or that contain cleared undeveloped land, with or without stepping stones or single koala habitat trees, provide opportunities for koalas to move safely throughout the landscape. Development that removes an area that provides safe movement opportunities, fragments remaining koala habitat areas. This can occur through clearing or, where clearing has already occurred, by placing development in those areas. This reduces connectivity, impacts on koala safe movement and increases the risk of injury or death of koalas.

PO2 seeks to avoid koala habitat areas becoming fragmented from other koala habitat areas. To achieve this outcome development is to be sited and designed to avoid fragmenting koala habitat areas by:

- avoid removing vegetation between patches of koala habitat area; and
- providing corridors to facilitate koala movement in undeveloped areas.

Figures 1 to 4 provide examples of what is meant by avoiding fragmenting koala habitat areas that are currently connected.





Current scenario - Patches of koala habitat area connected by a stepping stone



Avoid fragmenting koala habitat areas by removing the stepping stone

Figure 3. Patches of koala habitat areas that are connected via vegetation acting as a stepping stone(s) being disconnected or isolated from the other patch by removal of the stepping stone(s)



Current scenario - Patches of koala habitat area connected by cleared land, with or without scattered koala habitat trees



Avoid fragmenting koala habitat areas by removing scattered trees and increasing the distance between remaining koala habitat areas or by placing development between koala habitat areas with no safe movement opportunities.

Figure 4. Patches of koala habitat areas that are connected by cleared land, with or without scattered koala habitat trees, being disconnected or isolated from the other patch by removing safe movement opportunities

If development proposes to remove habitat or other vegetation between koala habitat areas, corridors should be identified to ensure retained koala habitat areas are connected⁶. Some considerations when determining corridor width include:

- corridors should be as wide as possible to function effectively;
- the minimum corridor width should be guided by the home range size of koalas using it;
- for territorial species, (e.g., male koalas) the width should be greater than one home range size to avoid an individual preventing others from using the corridor;
- if the corridor is shorter than one home range size, the corridor may be narrower than the above-mentioned widths;
- longer corridors should be wider to ensure it contains sufficient resources for koalas to move and rest over extended periods while they travel and support multiple individuals using the corridor at the same time; and
- streams and rivers form useful locations for corridors, however the corridor should be wide enough to include continuous strips of flood free land that supports areas and habitat suitable for koala movement.

Literature recommends koala movement corridors should seek to be at least 100m wide to function effectively and to minimise edge effects. Further, studies recommend that after providing a minimum width of 100m, a nominal '10 percent rule' for corridor width versus length should be adhered to as a baseline. This means that the width of the corridor at its narrowest point should at least 100m or 10 percent of its length, whichever is greater.

When development is proposed in cleared areas, development should ensure that corridors are identified that connect remaining koala habitat areas on the lot.

PO2 Information Requirements

Development applications must include a plan in digital (preferably GIS) format that identifies impacts on connectivity. This includes:

- the location of koala habitat area within a development site and on immediately adjacent sites;
- areas proposed to be cleared and the types of development and infrastructure that will be located in those areas.

Development applications that are proposing to reduce connectivity must be accompanied by a report prepared by a suitably qualified ecologist that demonstrates how connectivity will be maintained by retaining existing connectivity and / or identified corridors. The report must specifically identify:

- the dimensions of the area (e.g., length by width) proposed to be retained to avoid fragmenting koala habitat areas;
- the composition on the area retained (e.g., does the area contain remnant or regrowth vegetation, what are the flora species in the retained area, does it contain koala habitat area, other native or non-native vegetation, is the area cleared, what is the location and distance between koala habitat areas or individual tree);
- any actions that will be undertaken on land retained to avoid fragmenting koala habitat areas that will improve connectivity between koala habitat areas (e.g., removing barriers, revegetating with koala habitat trees, the density of plantings, the distance between planted trees, encouraging natural revegetation);
- elevation and slope or areas to be retained to avoid fragmenting koala habitat areas;
- the location of waterways and waterbodies in relation to areas retained to avoid fragmenting koala habitat areas;
- management actions to ensure corridor functionality is maintained as anticipated: and
- discussion on why those areas are suitable for maintaining connectivity for koala movement.

The locations should be based on koala surveys of known koala locations, koala home ranges within the area and resident koala movement patterns or desktop analysis of koala's preferred habitat types for that locality and likely movement patterns.

⁶ See also Section 2.0 Key Concepts, "Connectivity" and "Corridors" for further information on how to achieve this PO.

Performance Outcomes PO3

PO3 The design and siting of development does not result in impediments that restrict the movement of koalas by providing for safe koala movement between highly connected patches of retained koala habitat area.

No acceptable outcome is prescribed.

Intent of PO3

In addition to clearing, placing barriers that prevent or restrict koala movement or placing dangerous impediments in a koala's way when moving across the landscape can lead to high levels of mortality. Impediments can be introduced into an area by changing land uses from ones that are suitable for koalas, to ones that introduce threats to koalas, such as dogs, cars, pools and other water bodies. Death and injury from vehicle strikes and dog attacks are amongst the highest urban development impacts leading to the decline of koalas.

Koala habitat areas located 200m or less from each other are considered 'highly connected patches'.⁷ The intent of PO3 is to ensure development is sited and designed to allow koalas to move safely between these highly connected patches, from one patch to another.

This may be achieved by incorporating koala sensitive design principles in the siting and design of the development for example:

- the installation of koala exclusion fences that prevent koalas accessing dangerous parts of a site;
- the installation of koala safe fences, underpasses and overpasses that allow koalas to safely move through an area; or
- reduced speed limits at times of the day where koalas are most active.

The design must ensure that there is opportunity for koalas to move safely from one patch of koala habitat to another and not create barriers that prevents koala movement or makes it dangerous for koalas to move across a site. Further information on practical examples of how to achieve PO3 can be found in the [Koala-sensitive Design Guideline: A guide to koala-sensitive design measures for planning and development activities](#).

PO3 Information Requirements

Development applications must include a plan in digital (preferably GIS) format that identifies:

- koala habitat areas that are within 200m of each other (on the development site and on adjacent / nearby lots);
- development and infrastructure proposed in-between patches of koala habitat areas including roads, fences, waterbodies and buildings;
- any proposed corridors, their width, proposed composition (e.g., native vegetation, other vegetation or cleared), proposed uses (e.g., conservation, open space).

For roads that separate koala habitat areas, applications must identify:

- the width of the road;
- measures proposed to reduce koalas being injured or killed by cars (e.g. overpasses, underpasses, road design and lighting, speed limits, signage).

Applications that introduce impediments to movement must include a report prepared by a suitably qualified ecologist that:

- identifies barriers to movement that will be proposed by the development; and
- includes justification why impediments to movement could not be located elsewhere; and
- outlines measures that will be undertaken to ensure koalas can move safely between highly connected patches of retained koala habitat area; and

⁷ See McAlpine et al, 2007.

- includes justification for why the proposed measures are suitable for providing safe koala movement opportunities.

Koala safety from construction activities

Performance Outcomes PO4

<p>PO4 The construction of the development does not increase the risk of injury or death of koalas.</p>	<p>AO4.1 A koala management plan is provided that includes:</p> <ol style="list-style-type: none"> 1. activities that may cause injury or death of koalas from construction activities; and 2. acceptable measures to avoid and mitigate injury or death of koalas from construction activities <p>Note: To demonstrate compliance with this acceptable outcome, a koala management plan must be prepared by a suitably qualified and experienced person.</p> <p>AND</p> <p>AO4.2 Interfering with koala habitat complies with the sequential clearing and koala spotter requirements under section 10 and 11 of the <i>Nature Conservation (Koala) Conservation Plan 2017</i>.</p>
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Intent of PO4

The intent of PO4 is to ensure koalas are not injured or killed as result of construction activities associated with a development. This includes clearing and subsequent construction activities that follow such as earthworks and building activities.

The risk to koalas can be higher in areas where clearing has previously occurred. Koalas will remain in or near their home range areas even after clearing has occurred. If koala habitat has been cleared on a site, it is possible that koalas will try to remain on the development site while it is being developed. Impacts to koalas on a development site may include:

- injury or death when trees are cleared while koalas are still in them or when trees fall on other trees that have koalas in them;
- falling into excavated pits and holes and become injured or trapped;
- koalas taking refuge in machinery at night and being injured when machinery starts the next day;
- being run over by heavy machinery;
- being stressed by dust impacting on remaining adjacent koala habitat; or
- being attacked by security dogs or dogs bought on site by employees working on the development site at construction stage.

Impacts to koalas can be managed through excluding koalas from dangerous worksites, providing koala safe movement areas through a development site, excluding dogs on site and ensuring dust and light does not affect adjacent koala habitat.

There are legal requirements for how koala habitat is cleared under the *Nature Conservation (Koala) Conservation Plan 2017* to ensure clearing minimises the risk of stress, injury or death to koalas. This includes sequential clearing requirements and having an experienced koala spotter on site when clearing occurs. For more information see section 11 of the *Nature Conservation (Koala) Conservation Plan 2017*.

Risks to koalas at the construction phase and management practices to avoid those risks should be identified in a Koala Management Plan. Acceptable management measures to mitigate risks can include:

- use koala exclusion fencing (temporary or permanent) in areas that may be dangerous to koalas (e.g., excavated pits, waterbodies, areas where guard dogs are present);
- checking machinery prior to use;
- raising awareness of site workers to watch for koalas on site;
- koala crossing signage on site roads;
- ensuring site worker's dogs are excluded from a site, on a leash or otherwise restrained; and
- ensuring a process is in place to ensure injured/sick animals are taken care of immediately, including by contacting or taking animals to the closest appropriate koala care agents (e.g., koala carers group, veterinary clinic, wildlife hospital).

The sequential clearing requirements of the *Nature Conservation (Koala) Conservation Plan 2017* must be followed.

PO4 Information Requirements

Applications must include a Koala Management Plan developed by a suitably qualified and experienced person that has knowledge of koala ecology and experience developing management plans. The Koala Management Plan must identify the following:

- all potential risks to koalas from clearing and construction activities proposed on site;
- all management measures that will be implemented to address those risks;
- the process and measures to address accidental injury or death of koalas; and
- the process for implementing the management plan including:
 - identifying the person responsible for implementing the plan (e.g., site supervisor, foreman); and
 - the process for training all contractors working on the site to comply with the plan.

The management plan must demonstrate compliance with the sequential clearing requirements of the *Nature Conservation (Koala) Conservation Plan 2017*.

Matters of State Environmental Significance

Performance Outcomes PO5

<p>PO5 Development:</p> <ol style="list-style-type: none"> 1. avoids impacts on matters of state environmental significance; or 2. minimises and mitigates impacts on matters of state environmental significance after demonstrating avoidance is not reasonably possible; and 3. provides an offset if, after demonstrating all reasonable avoidance, minimisation and mitigation measures are undertaken, the development results in an acceptable significant residual impact on a matter of state environmental significance that is a prescribed environmental matter. <p>Note: Guidance for determining if development will have a significant residual impact on koala habitat areas is provided in Chapter 2A of the Queensland Environmental Offsets Policy.</p> <p>Guidance for determining if development will have a significant residual impact on all other matters of state environmental significance is provided in the <i>Significant Residual Impact Guideline</i>, Department of State Development, Infrastructure and Planning, 2014.</p>	<p>No acceptable outcome is prescribed.</p>
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Intent of PO5

The State Planning Policy (SPP) requires development to avoid impacts on all matters of state environmental significance (MSES). Where impacts cannot be avoided, impacts must be minimised and mitigated, including through offsets. The intent of this performance outcome is to achieve the SPP state interest by ensuring the siting, design, construction and operations of development will be undertaken to avoid, reduce and manage real or potential risks and impacts to MSES. It also aims to ensure that unavoidable impacts on MSES⁸ are counterbalanced through offsets.

The mitigation hierarchy is the framework that underpins Queensland's environmental impact assessment process requiring the development demonstrates the following.

1. Avoid

The development must avoid direct or indirect impact to MSES as much as reasonably possible, for example, through careful spatial and/or temporal placement (i.e. siting, design, time of day/year, duration of activity).

2. Mitigate

Where direct or indirect impacts to MSES cannot be completely avoided, impacts are carefully minimised and mitigated using measures that reduce the duration, intensity and or extent of direct or indirect impacts.

3. Offset (noting that offsets are not an option for all environmental matters)

Under the SPP and the Queensland Environmental Offsets Policy, impacts to all MSES must be avoided in the first instances and where avoidance cannot be achieved, impacts must be carefully managed and minimised (mitigated).

It is a legislative requirement under the SPP that all planning and development activities implement the avoid and mitigate components of the mitigation hierarchy with respects to MSES. The intent of the first two components of this performance outcome is to ensure that development avoids and mitigates impacts to MSES to the greatest extent possible through careful siting and design. This is also a requirement of the Queensland Environmental Offsets Framework.

The third component of this performance outcome is to ensure that where development will likely result in a significant residual impact to MSES that are prescribed environmental matters, despite all reasonable avoidance and mitigation, an environmental offset is provided in accordance with the Queensland Environmental Offset Policy. Section 5(2), section 5(3) and schedule 2 of the Environmental Offsets Regulation list the MSES that are prescribed environmental matters.

It is important to note that some MSES are not prescribed environmental matters where they occur in urban areas. The *Information sheet: Resources for assessing environmental offset obligations, Environmental Offsets Act 2014. Resources for matters of state environmental significance* (<https://environment.des.qld.gov.au/assets/documents/pollution/management/offsets/resources-for-mses-information-sheet.pdf>) Table 1, Column 2 outlines the MSES that are prescribed environmental matters outside of urban areas. Column 3 of Table 1 outlines the MSES that are prescribed environmental matters inside of urban areas. Regardless of whether a MSES is a prescribed environmental matter, impacts must be avoided and mitigated to satisfy the legislative requirements of the State Planning Policy and Queensland Environmental Offsets Framework.

Most MSES are spatially identified on the [Development Assessment System \(DAMS\)](#), [State Planning Policy \(SPP\) Interactive Mapping System](#) and [Queensland Globe](#).

A suitably qualified ecologist must undertake an assessment against the Significant Residual Impact criteria in Chapter 2A of the Environmental Offsets Policy Guideline to determine whether any residual impacts prescribed environmental matters are likely to be 'significant'. The results of this assessment should be provided to support an application. Where this assessment identifies that there will be a significant residual impact to MSES that are prescribed environmental matters, an environmental offset in accordance with the Queensland Environmental Offset Policy may be required to fully counterbalance this impact.

⁸ The koala is a MSES.

As SARA places an emphasis on the avoidance and mitigation of adverse impacts on MSES, it should not be assumed that offsets will be automatically supported. Applicants must be able to demonstrate that all reasonable steps have been or will be undertaken to avoid and mitigate impacts to MSES and that an offset is a suitable outcome. There are instances where an offset would not be a suitable outcome, for example where the risk of the offset failing to achieve a conservation outcome is too high. This may be the case if the MSES is extremely threatened, highly localised, or efforts to restore or offset the value have proven to be unsuccessful.

If offsetting is being considered as part of the application, a pre-lodgement meeting with SARA is recommended to determine whether offsetting is a feasible option. Where an offset is considered to not be a suitable outcome, further an avoidance and mitigation will be required to ensure there will be no significant residual impact on a MSES that is a prescribed environmental matter.

PO5 Information Requirements

Development applications must include a plan in digital (preferably GIS) format identifying the extent of MSES on the impact site and within close proximity to the impact site with respect to the location of proposed development footprint or boundary realignment.

To determine the extent of MSES⁹ on site, refer to:

- the **DAMS** (<https://dams.dsdip.esriaustraliaonline.com.au/damappingsystem/>) and **SPP Interactive Mapping System** (<https://spp.dsdip.esriaustraliaonline.com.au/geoviewer/map/planmaking>) on the DSDMIP website; or
- **Queensland Globe** (<https://qldglobe.information.qld.gov.au/>); or
- **Environmental Reports Online (MSES)** from the Queensland Government website: (<https://apps.des.qld.gov.au/report-request/environment/>).

MSES mapping is indicative. Site specific survey and mapping is recommended to confirm the extent of MSES on-site.

Submission of an ecological assessment undertaken by a suitably qualified ecologist and prepared to the standards specified in Part 6 Supporting information of the [State Planning Policy Guideline Biodiversity](#) is required if:

- detailed site surveys confirm the development site is at a location where the presence or extent of on-site MSES differs from the current MSES mapping;
- development is located within MSES on-site or adjoins MSES (on or off the site) and may cause an impact on MSES.

Applications for development located close to MSES (on or off site) must demonstrate how the development has been sited and designed to avoid impacts to MSES to the greatest extent possible. Where avoidance is not reasonably possible, applications must demonstrate why this was not reasonably possible and demonstrate how the development has been sited and designed to minimise and mitigate impacts to MSES to the greatest extent possible. Where there will be any residual impact to MSES, applications must demonstrate why further avoidance and mitigation was not reasonably possible.

To assist assessment of PO5 it is recommended that ecological assessments address the 'avoid, minimise and mitigate' framework, in particular, how the development proposal reduces impacts on MSES through location and design measures.

If there is an impact on MSES, applicants must submit a report by a suitably qualified person that provides an assessment against the Significant Residual Impact criteria justifying whether the residual impact is likely to be significant or not. This report will provide sufficient information to supporting the assessment findings.

SARA will advise in writing whether SRI on MSES are acceptable and, if so, an offset condition will be imposed on the development approval requiring that an environmental offset is undertaken in accordance with the Queensland Environmental Offsets Framework.

Development which does not provide sufficient justification or evidence as to how impacts on MSES have been avoided or minimised may not be approved.

⁹ For MSES that is koala habitat area, applicants must provide the information requirements identified in PO1 and address the PO5 "avoid, minimise, mitigate" framework, Significant Residual Impact and offsets information requirements.

Applicants should refer also to the [Checklist: Assessing environmental offset obligations, Environmental Offsets Act 2014. Avoid and mitigate assessment checklist](#) (<https://environment.des.qld.gov.au/assets/documents/pollution/management/offsets/avoid-and-mitigate-assessment-checklist.docx>).

Category C and R vegetation

Performance Outcomes PO6

<p>PO6 Development:</p> <ul style="list-style-type: none"> • avoids impacts on category C areas of vegetation and category R areas of vegetation; or • minimises and mitigates impacts on category C areas of vegetation and category R areas of vegetation after demonstrating avoidance is not reasonably possible. 	<p>No acceptable outcome is prescribed.</p>
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Intent of PO6

The difference between PO5 and PO6 is that Category C areas and Category R areas are not prescribed environmental matters under the Queensland Environmental Offsets Framework and therefore an offset cannot be required for significant residual impacts to these matters. The SPP requires that all planning and development activities avoid and mitigate impacts to all MSES. Therefore, the intent of this performance outcome is to ensure this legislative requirement of the SPP is met by ensure impacts to Category C areas and Category R areas are avoided, minimised and mitigated to the greatest extent possible.

These vegetation categories are defined in the *Vegetation Management Act 1999*. Category C areas contain regrowth vegetation classified as 'endangered', 'of concern' or 'least concern' regional ecosystems that has not been cleared for at least 15 years (i.e. not remnant vegetation) and is located on freehold land, indigenous land, or State leasehold land granted for agricultural or grazing purposes. Category R areas in South East Queensland are regrowth watercourse and drainage areas within 50 metres of a watercourse in the Burnett–Mary catchment.

These are shown on the [DAMS](https://dams.dsdiip.esriaustraliaonline.com.au/damappingsystem/) (<https://dams.dsdiip.esriaustraliaonline.com.au/damappingsystem/>) and [Queensland Globe](https://qldglobe.information.qld.gov.au/) (<https://qldglobe.information.qld.gov.au/>).

Environmental offsets cannot be required for significant residual impacts to Category C areas and Category R areas. Instead, development must focus on avoiding impacts to these matters and where avoidance is not possible, impacts on these regional ecosystems are minimised and mitigated.

PO6 Information Requirements

Information requirements for PO6 are the same as for PO5 with one significant difference - offset requirements do not apply to Category C and R areas.

When preparing an ecological assessment, differentiate discussion of Category C and R vegetation from other vegetation categories to assist assessment in relation to offset requirements.

Development applications that are proposing to impact on Category C and R vegetation, including from clearing, must submit a report prepared by a suitably qualified ecologist that identifies:

- areas proposed to be cleared or otherwise impacted;
- why impacts cannot be avoided;
- measures taken to minimise and mitigate impacts of clearing.

Applicants should refer also to the [Checklist: Assessing environmental offset obligations, Environmental Offsets Act 2014. Avoid and mitigate assessment checklist](#) (<https://environment.des.qld.gov.au/assets/documents/pollution/management/offsets/avoid-and-mitigate-assessment-checklist.docx>).

4.0 Supporting references

Checklist Assessing environmental offset obligations *Environmental Offsets Act 2014 Avoid and mitigate assessment checklist* Department of Environment and Science June 2018
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(https://www.redland.qld.gov.au/download/downloads/id/2773/wildlife_connection_plan_2018_-2028.pdf)

Significant Residual Impact Guidelines - For matters of state environmental significance and prescribed matters under the Sustainable Planning Act 2009, Department of Infrastructure, Local Government and Planning, 2014
(<http://www.dlgrma.qld.gov.au/resources/guideline/planning/dsdip-significant-residual-impact-guideline.pdf>)

State Planning Policy State Interest Guideline Biodiversity, Department of Infrastructure, Local Government and Planning, April 2016 (<https://dsdmipprd.blob.core.windows.net/general/spp-guidance-biodiversity-july-2017.pdf>)