

Cassowaries in planning schemes guideline

Prepared by Terrain NRM for the Cassowary Recovery Team



LEGEND
 Potential Cassowary habitat outside NP (shaded pink)
 MAP 9: HABITAT LINKAGE 1 - Overview



Photos/design Liz Gallie

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Executive summary

Cassowaries are an endangered species threatened by development. Certain outcomes from development can assist cassowary populations to persist and recover. This non-statutory guideline identifies provisions for cassowaries that could be incorporated into local government planning schemes. It applies predominantly to identified cassowary areas and populations under threat in the Wet Tropics bioregion.

The guideline provides information on cassowary mapping resources and methods, including DEHP's cassowary habitat mapping. The guideline includes definitions for the various mapped categories of cassowary habitat and corridors.

Outcomes recommended in the guideline include the following:

- Cassowaries and their habitat and habitat links are referred to in the Strategic framework.
- Mapping identifies cassowary habitat and habitat links including primary, secondary and rehabilitating habitat, non-remnant corridor and additional areas identified through new mapping.
- Fine-scale mapping (particularly of local corridors) is undertaken in cassowary areas and populations under threat.
- A material change of use, reconfiguring a lot or operational work within cassowary habitat or a habitat link is assessed against cassowary provisions in a code. Within critical habitat links, assessable development includes clearing of small areas and development in existing cleared areas.
- Cassowary habitat and habitat links are protected.
- Development is located outside of habitat and habitat links.
- Development adjacent to cassowary habitat and habitat links is low density due to roadkill threat.
- Traffic-producing development addresses cassowary roadkill.
- Fences allow cassowary access in cassowary habitat and habitat links.
- Development does not increase hazards from cassowary-human interaction.
- Offsets are restricted to non-cassowary habitat residual impacts.

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC) also regulates certain development impacts on cassowaries.

Introduction

The purpose of this non-statutory guideline is to assist local governments drafting SPA planning schemes or planning scheme amendments to incorporate cassowary provisions. The purpose is also to assist state government, conservation groups, development industry and others reviewing draft planning schemes or amendments regarding cassowaries. This guideline focuses on local government areas covered by the *Far North Queensland Regional Plan 2009-2031* (FNQRP) i.e. Cassowary Coast, Cairns and Tablelands Regional Councils and Yarrabah and Wujal Wujal Aboriginal Shire Councils, but may also assist other local government areas with cassowary populations, i.e. Townsville City and Hinchinbrook and Cook Shire Councils.

The Wet Tropics population of the southern cassowary *Casuarius casuarius johnsonii* (hereafter referred to as cassowary) is listed as an endangered species under the Queensland *Nature Conservation Act 1992* and the Commonwealth *EPBC Act*. The Queensland government has prepared planning scheme guidelines for some threatened species, e.g. South East Queensland koalas, but not for cassowaries. This non-statutory cassowary guideline was prepared by Terrain NRM for the Cassowary Recovery Team in consultation with stakeholders, particularly government and conservation.

The Cassowary Recovery Team is a group of organisations working together to implement the Recovery Plan for the Southern Cassowary and protect cassowaries, habitats and corridors from threats through better planning, monitoring and community involvement. Recovery plans set out the

research and management actions necessary to stop the decline of, and support the recovery of, listed threatened species or threatened ecological communities. Terrain is a community-based not-for-profit Regional Body supporting natural resource management in the Wet Tropics region. Terrain has also prepared a planning scheme guideline for the Mahogany glider which is another endangered species affected by development in FNQ.

This guideline is informed by the statutory *FNQRP Regional Policy 1.1 Biodiversity Conservation*, Areas of ecological significance (AES) mapping, and by the non-statutory *FNQRP Implementation Guideline for Section 1.1 – Biodiversity Conservation* (Biodiversity Guideline). As a state interest, FNQRP Regional Policy and AES mapping must be reflected in planning schemes. Local government may identify additional biodiversity values (e.g. cassowaries) for its planning scheme. FNQRP and the Biodiversity Guideline do not provide cassowary-specific mapping or policies. Many of the measures in FNQRP and the Biodiversity Guideline or standard biodiversity provisions will generally benefit cassowaries. However cassowaries are an endangered species particularly threatened by development and require particular environmental outcomes from development in order for populations to persist and recover. This cassowary guideline assumes planning schemes will include general biodiversity provisions, and therefore focuses on additional cassowary-specific measures.

Recent Queensland government planning legislation amendments have resulted in reduced regulation of certain development by state government and increased opportunity for local government to decide future land use outcomes. These changes have increased the importance of local government planning schemes in determining the cassowary's future.

The *Recovery Plan for the Southern Cassowary and Significant Impact Guidelines for the Endangered Southern Cassowary* identify habitat clearing and fragmentation as the major threats to cassowaries' long-term survival, with vehicle strike and dog attack the number one and two direct causes of mortality. The Recovery Plan's overall objective is "to secure the long-term protection of cassowary populations through improved planning mechanisms supported by robust monitoring, threat abatement and community engagement programmes". Recovery Plan specific objectives and actions include to "institute a more coordinated and stronger planning response to development issues in cassowary habitat" and "help develop better planning scheme mechanisms to protect cassowary habitat".

This voluntary guideline identifies various potential planning scheme provisions for cassowaries. It is not intended that all the provisions be included in any one scheme. Nor does this guideline identify all possibilities. There are various ways to structure planning schemes and it is hoped that Councils will work with DSDIP, DEHP, cassowary experts and others to incorporate an effective selection of cassowary provisions into planning schemes.

Cassowary areas and populations under threat

This guideline is intended to apply predominantly to "Areas and populations under threat" identified in the Recovery Plan for the Southern Cassowary, rather than isolated habitat fragments in densely developed areas with no modern cassowary records.

The Recovery Plan identifies eight key areas in the Wet Tropics which are seriously threatened by development activities (p14):

1. *Mission Beach*
2. *Daintree/Mossman lowlands*
3. *Kuranda/Black Mountain corridor*
4. *Cairns hill slopes*
5. *Mulgrave Valley/Malbon-Thompson Range*
6. *southern Atherton Tablelands*
7. *Graham/Palmerston/Moresby Range, and*
8. *Kennedy Valley/Murray River floodplain.*

These same areas are also listed in DEWHA's *Significant Impact Guidelines for the Endangered Southern Cassowary* (p19). There is no official map of these "cassowary areas and populations under threat".

Strategic framework

A selection of the following outcomes for the Strategic framework is recommended:

- *Strategic framework specific outcomes (possibly in the biodiversity element of the natural environment theme) include “Cassowary habitat and habitat links are protected from the impacts of development” and “Habitat extent, condition, connectivity and resilience are improved for cassowary areas and populations under threat”.*
- *Land use strategies include “Cassowary habitat and habitat links in cassowary areas and populations under threat are identified and protected from development, and residential densities in adjacent areas are kept low to avoid increasing traffic generation”.*
- *Cassowary areas and populations under threat in the local government area are broadly named or mapped in the Strategic framework.*
- *Councils that do not have the resources to undertake detailed cassowary habitat and habitat link mapping flag this future mapping intent in the Strategic framework. Likewise, ecologically effective cassowary road crossing infrastructure design, costing and reasonable and relevant charging are flagged.*

Tables of assessment

A selection of the following outcomes for the Tables of assessment is recommended:

- *Development that is a material change of use, reconfiguring a lot or operational work within cassowary habitat or a habitat link is assessable against cassowary provisions in a code. This includes development in existing cleared areas within a habitat link. This also includes clearing for firebreaks.*
- *Clearing of any cassowary habitat in an identified cassowary habitat link in an urban area is impact assessable.*
- *Unless property-scale mapping of cassowary habitat and habitat links and corresponding appropriate code provisions are included in the planning scheme, development in cassowary habitat and habitat links is impact assessable.*

Explanatory notes:

Clearing cassowary habitat in urban areas for urban purposes is often exempt under current IPA planning schemes. The clearing of even a small area may result in fragmentation of an important cassowary habitat link. Development in cleared areas in narrow habitat links can irreversibly sever habitat links.

N.B. Under the *EPBC Act*, any planned actions which exceed certain thresholds may have a significant impact on a matter of national environmental significance (the cassowary) and should be referred to the federal environment minister; e.g. clearing more than 1500m² of cassowary habitat for any purpose other than a single dwelling on an existing lot; any clearing of cassowary habitat associated with a watercourse; clearing in certain buffers adjacent to habitat, etc. See the following link for more information:

<http://www.environment.gov.au/epbc/publications/pubs/casuarius-casuarius-johnsonii.pdf>

Mapping outcomes

A selection of the following mapping outcomes is recommended:

- *Zones, precincts, local plans and overlay maps are informed by appropriate cassowary habitat and habitat links mapping.*
- *Cassowary habitat and habitat links are mapped in a “cassowary” or “priority species” overlay map.*
- *A “biodiversity areas” overlay map includes all current AES mapping plus additional cassowary habitat and habitat links not captured by the AES mapping.*
- *Mapping shows all cassowary habitat and habitat links, including Primary habitat, Secondary habitat, Rehabilitating habitat and Non-remnant corridor.*
- *Mapping highlights habitat and habitat links where additional outcomes apply, e.g. cassowary areas and populations under threat, revegetation areas and road crossing zones.*
- *Property-scale mapping identifies local habitat links (including strategic cleared areas) particularly in urban and rural residential areas in cassowary areas and populations under threat.*

- *Mapping identifies strategic rehabilitation areas to be revegetated or at least remain open to cassowary movement.*
- *Cassowary habitat and habitat links are zoned Conservation (Level 2) or at least Environmental Management and Conservation (Level 1).*
- *Cassowary “areas and populations under threat” are zoned Conservation.*
- *Local plans are prepared for cassowary “areas and populations under threat”. The spatial extent of the local plan includes the main areas where development would generate motor traffic through the cassowary habitat and habitat links.*
- *Cassowary habitat and habitat links are not zoned for residential development or tourist accommodation.*
- *Non-conservation zones (e.g. residential, commercial and industrial) are not introduced or extended in cassowary habitat or habitat links.*
- *Habitat and habitat links in a conservation zone in a current IPA planning scheme are zoned Conservation in the SPA scheme.*
- *Habitat and habitat links in a non-conservation zone in a current IPA planning scheme are identified as constrained in the SPA scheme.*
- *Residential zones adjacent to cassowary habitat, habitat links and “areas and populations under threat” are low density.*

Explanatory notes:

Mapping resources are listed in the “Cassowary mapping resources” section below. A key resource is DEHP’s cassowary habitat mapping.

AES mapping alone is not adequate for cassowary mapping in a planning scheme. AES mapping is broad scale, not property scale, and excludes some important habitat and habitat links.

Mapping of cassowary habitat links is critical. Some open/cleared areas that are critical components of cassowary habitat links are not yet meaningfully mapped, including in AES and Strategic Rehabilitation Areas mapping.

Some new mapping (particularly local corridors) is a necessary part of plan making in cassowary “areas and populations under threat” to prevent cassowary decline through habitat fragmentation.

1:10,000 scale mapping of habitat linkages has been effective in some fragmented areas of Mission Beach.

Code outcomes

A selection of the following outcomes is recommended for inclusion in codes applying to mapped cassowary habitat and habitat links, e.g. biodiversity areas overlay code, conservation zone code, and certain residential, precinct and local plan codes:

“Development” means a material change of use, reconfiguring a lot or operational work.

General code outcomes:

- *Code purpose statements refer to threatened species including cassowaries.*
- *Code overall outcomes include that cassowary habitat and habitat links are protected.*
- *Code purpose statements or overall outcomes refer to not increasing development density in cassowary “areas and populations under threat” to minimise motor traffic and cassowary roadkill.*
- *A specific cassowary/priority species overlay code is provided.*
- *A biodiversity areas overlay code includes a specific category of outcomes that apply to mapped cassowary habitat and habitat links.*

Habitat and habitat links outcomes:

- *Development is located, designed and operated to maintain and enhance the extent, condition, connectivity and resilience of cassowary habitat and habitat links, and allows cassowary populations and individuals (including dispersing and breeding cassowaries) to safely access adequate feeding, drinking, breeding (including nesting) and resting habitat and remain connected in the landscape.*
- *Urban development is located wholly outside of cassowary habitat and habitat links.*
- *Clearing is avoided in cassowary habitat and habitat links.*
- *The development footprint (including building envelopes, roads and fire breaks) does not encroach into cassowary habitat or habitat links.*

- *Open areas within habitat links are retained as open or are revegetated.*
- *Connectivity to adjacent habitat links is retained.*
- *Habitat links are a minimum width of 200 metres in urban areas and exclude development.*
- *Additional strategic habitat is created.*
- *An appropriately qualified person assesses fire break clearing requirements in cassowary habitat and habitat links, particularly in rainforest vegetation.*

Explanatory notes:

The major threat to the long-term survival of cassowaries is clearing and fragmentation of habitat. DEWHA's *Significant Impact Guidelines for the Endangered Southern Cassowary* provides the following information:

- Habitat and corridor requirements are described in the "Key landscape values for the cassowary" section including feeding habitat, breeding habitat, water, resting habitat and corridors for movement (pp 7-8).
- Guidelines for ecological site assessment are provided in the "Survey guidelines for the cassowary" section (pp10-11). This could inform a Planning Scheme Policy.
- Multiple habitat links decrease the risk of antagonistic encounters between territorial cassowaries (p14).
- Corridors should be a minimum width of 200m if development abuts either side (p18).

See Fencing outcomes for additional habitat link provisions specific to physical barriers to connectivity.

Traffic outcomes:

- *Development maintains and enhances cassowary road crossing safety.*
- *Roads are not constructed in cassowary habitat or habitat links.*
- *On-site road design speed is less than 60 km/h.*
- *Traffic-producing development is avoided in cassowary habitat and habitat links.*
- *Development adjacent to cassowary habitat and habitat links and cassowary "areas and population under threat" is low density and maximises active (walking & cycling) transport.*
- *Development that produces motor traffic within or through cassowary habitat or habitat links (on-site or off-site) reasonably contributes to ecologically effective cassowary road crossing infrastructure.*
- *Streetscaping does not include cassowary attracting plants, e.g. cassowary food plants.*

Explanatory notes:

Roadkill is the major direct cause of cassowary mortality. Development generally increases traffic. The standard outcome of a range of residential dwelling densities including medium densities is not appropriate in cassowary areas.

A development's production of motor traffic through onsite and offsite cassowary habitat and habitat links should be considered, including over the lifetime of the development.

In cassowary areas and populations where there is clear link between the impacts of development and cassowary roadkill, Councils could investigate the possibility of a cassowary road crossing infrastructure charges plan. Such a plan could design and cost the cassowary road crossing infrastructure needed in a local area as a result of local traffic-producing development and condition reasonable and relevant contributions from local development towards the construction of the infrastructure. Research has shown that fences, culverts, static signage and psychological traffic calming are not effective traffic solutions for cassowaries. There is currently no proven effective infrastructure.

A planning scheme policy could list cassowary food plants. Food plants information is available here: <http://cassowaryrecoveryteam.org/get-involved/food-plants/>

Fencing outcomes:

- *Structures do not reduce cassowary access to on-site habitat and habitat links and adjacent habitat and habitat links, including waterways.*
- *Fences are not installed in cassowary habitat and habitat links.*
- *Property boundaries (as opposed to building envelopes) within or adjacent to cassowary habitat and habitat links are not fenced.*
- *Cassowaries can readily pass through all fences within cassowary habitat and habitat links.*

- *Building envelope fences are opaque to cassowaries and dogs, and are cassowary-proof and dog-proof.*

Explanatory notes:

Cassowaries are vulnerable to entrapment by fences through which they can see habitat on the other side (e.g. chain-link). Fencing a building envelope rather than a property boundary assists landscape permeability for cassowaries. Opaque fences around building envelopes help prevent dogs within from seeing cassowaries and barking and displacing them from habitat and links. Opaque fences help reduce cassowary desire to enter building envelopes. Fence design should address the significant size difference between chicks and adults; e.g. so chicks and parents aren't separated. Fences often become ineffective or counter-productive post-cyclone.

Cassowary-human interaction outcomes:

- *Development avoids interaction of people and cassowaries.*
- *Development (including shared residential pathways) is located wholly outside of cassowary habitat and habitat links;*
- *Landscaping within building envelopes does not include cassowary food plants.*

Explanatory notes:

Cassowaries are potentially dangerous. Development within or adjacent to cassowary habitat and habitat links may increase this hazard.

Offset outcomes:

- *Offsets result in a net gain for cassowaries.*
- *Offsets are restricted to non-cassowary habitat residual impacts.*
- *Offsets are invested in a cassowary Non-remnant corridor within a Cassowary Corridor.*

Dog outcomes:

- *Cassowaries are not deterred from utilising habitat and habitat links by dogs.*
- *Development restricts keeping and movement of dogs in cassowary habitat and habitat links and adjacent areas.*
- *Urban development is located wholly outside of cassowary habitat and habitat links.*

Explanatory notes:

Dog attack is the second highest recorded cause of cassowary mortality. Dog barking, odours, etc may deter cassowaries from utilising habitat and habitat links. Restricting dogs to within building envelopes with opaque fences might reduce cassowary/dog interaction. Locating development outside of cassowary habitat and habitat links will help prevent increased dog ownership within habitat and links. Proponents could undertake to make their development dog-free. Dogs may be referred to in a planning scheme policy.

NB The management of domestic animals is typically regulated through local laws rather than planning schemes. Planning schemes provisions may limit keeping and movement of dogs in some development.

Cassowary mapping resources

In addition to AES mapping, the mapping data sources listed in this section could inform mapping for zones, local plans, precincts, overlays etc regarding cassowary habitat and habitat links.

Categories within some of these mapping resources are explained in the "Definitions" section.

As explained in the Mapping outcomes section above, it is likely that habitat linkages in some important areas have not yet been accurately mapped. Additional mapping to fill such gaps is recommended.

DEHP Threatened Species unit

DEHP Threatened Species unit have collated GIS files of a selection of cassowary mapping resources listed below into zipfiles. The files include metadata listing the references. There are three different datasets; the poly and line features are best for map production, and the consolidated features can be used for analysis (if needed). Regarding licensing, sources must be acknowledged in any external publication. For further information on the zipfiles, contact DEHP Threatened Species unit: Paula.Peeters@ehp.qld.gov.au.

The zipfiles are available here:

<http://www.terrain.org.au/programs/biodiversity/threatened-species-planning.html>

FNQROC IBAPF

FNQ Regional Organisation of Councils (FNQROC) has developed an Interactive Biodiversity Assessment and Planning Framework (IBAPF). The IBAPF combines maps of various biodiversity assets in the FNQ region, including known cassowary habitat and corridors, and can be used to map priority habitats and corridors to protect and restore, including through planning schemes. For more information on IBAPF, contact: t.sydes@fnqroc.qld.gov.au.

Expert panel

In cassowary “areas and populations under threat”, the following mapping process is recommended:

- organise a meeting in the local government area with local cassowary experts from community, industry and government including Traditional Owners;
- present the meeting with existing cassowary maps;
- ask the meeting to identify any significant gaps in existing mapping, particularly local cassowary corridors;
- engage a biodiversity planning consultant to produce property-scale habitat link mapping for priority areas identified by the meeting;
- show the consultant’s draft map to the experts for comment;
- add the finalised map to existing mapping.

Primary resources

The following resources are priority cassowary mapping resources that cover most of the Wet Tropics region:

Biotropica Australia, 2005 *A framework to establish lowland habitat linkages for the Southern Cassowary (Casuarius casuarius johnsonii) between Cairns and Cardwell*. Report commissioned by the Australian Rainforest Foundation, Cairns.

DEHP Cassowary habitat mapping

Source: http://www.derm.qld.gov.au/property/mapping/order_data.html

This is a key source of cassowary habitat mapping.

The current version is Version 6b from 2009.

Cassowary habitat map categories include primary, secondary, rehabilitating and non-remnant corridor.

DERM 2009, *Distribution of cassowary habitat in the Wet Tropics bioregion, Queensland (3rd Edition)*, DERM, Queensland.

This document describes the processes and background information used to map cassowary habitat in the Wet Tropics bioregion to produce the Cassowary habitat mapping Version 6b from 2009.

DEWHA, 2010, *Significant impact guidelines for the endangered southern cassowary (Casuarius casuarius johnsonii)*

<http://www.environment.gov.au/epbc/publications/pubs/casuarius-casuarius-johnsonii.pdf>

Map 2: *Potential southern cassowary habitat* in this report shows Cassowary Habitat and Cassowary Corridors.

<http://www.environment.gov.au/epbc/publications/pubs/casuarius-casuarius-johnsonii-map.pdf>

Some important Cassowary Corridors identified here are not clearly identified in AES or DEHP mapping.

Page 14 of the report notes that “corridors not shown on Map 2 may also be important”.

The GIS files are available here:

<http://www.terrain.org.au/programs/biodiversity/threatened-species-planning.html>

Latch, P. 2007. *Recovery plan for the southern cassowary Casuarius casuarius johnsonii*. Report to Department of the Environment, Water, Heritage and the Arts, Canberra. Environmental Protection Agency.

<http://www.environment.gov.au/biodiversity/threatened/publications/recovery/southern-cassowary/pubs/sth-cassowary.pdf>

Figure 2: Distribution of cassowary habitat Wet Tropics mapping identifies the following categories: essential habitat, general habitat, rehabilitating habitat, potential habitat links for restoration.

Wet Tropics Management Authority 2006, *Draft Wet Tropics Coastal Cassowary Corridor Network: Strategic Priorities* (prepared for the Australian Rainforest Foundation).

Secondary resources

The following resources provide additional information:

DEHP Cassowary incident assessment database, DEHP Cassowary sightings database and DEHP Vehicle related cassowary deaths maps. Contact: DEHP Threatened Species unit

DEHP WildNet

<http://www.ehp.qld.gov.au/wildlife/wildlife-online>

Vegetation Management Act: Essential Habitat mapping.

http://www.derm.qld.gov.au/vegetation/code_review_06/eh_review.html

“Essential habitat” generally includes remnant cassowary habitat but excludes non-remnant or rehabilitating cassowary habitat and corridors. Therefore protection of “essential habitat” alone is not adequate for cassowary conservation.

Cairns region resources

The following resources are specific to the Cairns Regional Council area:

Daintree Region Cassowary Group Cassowary Sighting Map

<http://daintreecassowary.org.au/sighting/map>

Cassowary Coast region resources

The following resources are specific to the Cassowary Coast Regional Council area:

Biotropica Australia, 2008 *Wongaling Creek Habitat Linkages*.

Biotropica Australia, 2009 *Wongaling - South Mission Beach Habitat Linkages*.

Biotropica Australia, 2010 *South Mission Beach (Lugger & Kennedy Bays) Habitat Linkages - Indicative Cassowary Movement Corridors Map*.

C4 Cassowary sightings spreadsheet. Contact: c4@cassowaryconservation.asn.au

Goosem, M., Moore, L. A., Byrnes, P. and Gibson, M. (2011) *Mission Beach Road Research: Impacts on Cassowaries and other Fauna and Strategies for Mitigation*. School of Earth and Environmental Science, James Cook University, Cairns.

<http://www.terrain.org.au/images/stories/programs/terrestrial-biodiversity/mission-beach/JCU%20Cassowary%20Report%20final.pdf>

This report contains various maps of cassowary zones and some corridors in the Mission Beach area.

Community conservation organisation resources

The following community conservation organisations have knowledge of local cassowary habitat and habitat links:

- Community for Coastal and Cassowary Conservation (C4): c4@cassowaryconservation.asn.au
- Daintree Region Cassowary Group: <http://www.daintreecassowary.org.au/>
- Kuranda Conservation Community Nursery Inc.: <http://www.kurandaconservation.org/>
- Kuranda Envirocare: <http://www.envirocare.org.au/>
- Mission Beach Cassowaries: <http://www.missionbeachcassowaries.com/>
- WPSQ Tully Branch: <http://tully.wildlife.org.au/>

Traditional Owners should be consulted, e.g. Rainforest Aboriginal Peoples Alliance; contact: rapacoordinator@gmail.com

Definitions

Habitat link: A cassowary “habitat link” is equivalent to a cassowary “corridor” or “habitat linkage”. Significant Impact Guidelines for the Endangered Southern Cassowary notes that corridors for movement “may include open areas as well as vegetated areas” (p7).

Building envelope is not defined under SPA and for the purpose of this guideline means the area within a lot that may contain dogs and does not include habitat or habitat linkages.

The following cassowary habitat mapping category definitions/descriptions are condensed from DERM (DEHP) 2009 *Distribution of cassowary habitat in the Wet Tropics bioregion, Queensland*.

Primary habitat: remnant regional ecosystems where there is an accurate and verified record of a cassowary and the ecosystem is known to be preferentially used by cassowaries for breeding, feeding and general activity; also includes secondary habitat in “identified cassowary corridors”.

Secondary habitat: remnant regional ecosystems where there is an accurate and verified record of a cassowary, but is not known to be preferentially used as habitat; also includes remnant vegetation not otherwise considered habitat and rehabilitating habitat that is within “identified cassowary corridors”.

Rehabilitating habitat: non-remnant vegetation characterised by predominantly native species that has been disturbed and is regenerating. Prior to disturbance it would have been classified as either Primary or Secondary habitat. It provides shelter and supplementary feeding and breeding resources. Rehabilitating habitat sometimes provides linking habitat that cassowaries use to traverse between Primary or Secondary habitat. Also includes disturbed or regenerating vegetation that would not have been classified as habitat prior to disturbance where it occurs within “identified cassowary corridors”.

Non-remnant corridor: areas mapped as non-remnant vegetation in “identified cassowary corridors” that are known to be used or likely to be used by cassowaries to traverse between primary or secondary habitat.

Other categories are **Cleared**, **Cultivated** and **Absent**. Cleared and Cultivated land is sometimes used by cassowaries to traverse between areas of habitat.

Essential Habitat: Primary habitat and priority Secondary habitat. Essential Habitat excludes Non-remnant corridor, Rehabilitating habitat, and most areas of Secondary habitat.

Identified cassowary corridors are regional broadscale cassowary corridors identified by DNRME & WTMA in 2004. They generally do not identify local corridors. For example they do not identify many of the Mission Beach habitat linkages identified by Biotropica 2008- 2010 although these have subsequently been submitted to DEHP for possible inclusion.

Note: The above DERM 2009 categories purposefully exclude habitat and habitat links in urban areas, although some of these may be important, particularly for connectivity. They also obviously don't include additional habitat and habitat links identified or created since 2009.

The following definitions are condensed from *Far North Queensland Regional Plan 2009-2031*.

Areas of ecological significance (**AES**) consists of Areas of high ecological significance (HES), Areas of general ecological significance (GES) and probably Strategic rehabilitation areas (SRA).

HES includes Essential cassowary habitat.

GES includes cassowary habitat that is remnant vegetation (other than that already included in HES).

SRA includes cassowary corridors identified by Biotropica for the Australian Rainforest Foundation and Regional cassowary corridors identified by DEWHA.

HES and GES generally exclude all cassowary habitat and habitat links that are not remnant (i.e. exclude disturbed and regrowth habitat and habitat links).

SRA generally does not identify local cassowary corridors.

Significant impact guidelines for the endangered southern cassowary Map 2 shows “current distribution of potential cassowary habitat”, specifically **Cassowary Habitat** and **Cassowary Corridors**. The map was developed from QLD EPA 2006 Cassowary Habitat mapping and DEWHA 2004 Cassowary Corridors. The map includes areas of key ecological function, broad movement corridors and appropriate rehabilitating habitat, although "Cassowary Habitat" and "Cassowary Corridors" are not specifically defined. The map is broadscale, not property scale.

Recovery Plan for the southern cassowary Figure 2: Distribution of cassowary habitat Wet Tropics shows the following mapped categories: **Essential habitat**, **General Habitat**, **Rehabilitating habitat** and **Potential corridors for restoration**. These categories are not specifically defined, however Essential cassowary habitat is based on the Queensland Herbarium Wet Tropics Interim Regional Ecosystem (RE) 1:100,000 mapping Version 4 (2004), and broad landscape links identified under Wet Tropics Regional Vegetation Management Codes and in the Wet Tropics Conservation Strategy (WTMA 2004) form the basis for the 25 landscape corridors.

NB Non-Primary, non-Essential, non-AES and/or non-Remnant habitats retain significant habitat and resource values for the cassowary and may be critical for seasonal food resources, habitat connectivity, gene flow, juvenile dispersal, extreme weather response and overall survival of local cassowary populations, particularly in the highly fragmented wet tropical lowlands. They may also be significant sites to target for future habitat rehabilitation works.

References

Details for key references are provided in the Cassowary mapping resources section.

Further information

For further information on this guideline, please contact:

Terrain NRM: ph 4043 8000, info@terrain.org.au, <http://www.terrain.org.au/>

Cassowary Recovery Team: cassowaryrecoveryteam@gmail.com,
<http://cassowaryrecoveryteam.org>

DEHP Threatened Species unit: ph 3330 6399, Paula.Peeters@ehp.qld.gov.au.

This guideline is available electronically from:

<http://www.terrain.org.au/programs/biodiversity/threatened-species-planning.html>
<http://cassowaryrecoveryteam.org>.