

# **A Biodiversity Planning Assessment for the Gulf Plains Bioregion**

Flora Expert Panel Report

Version 1.1

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# Contents

1	Introduction .....	1
2	Method.....	3
2.1	Study area.....	3
2.2	Expert panel.....	5
2.3	Expert panel format.....	8
2.3.1	Species considerations (criteria A and H).....	8
2.3.2	Special biodiversity values (criteria I) .....	9
3	Results and discussion.....	10
3.1	Flora species considerations (criteria A and H).....	10
3.1.1	Habitat for endangered, vulnerable and near threatened flora species (criteria A).....	10
3.1.2	Core habitat for priority flora taxa (criterion H) .....	13
3.2	Special biodiversity values (criterion I) .....	16
3.3	Data collection .....	25
3.4	Data access and conditions.....	25
4	Summary .....	25
	References.....	26
	Appendix 1 Acronyms and abbreviations .....	27
	Appendix 2 Datasets available to the expert panel during the workshop.....	28
	GIS .....	28
	Geographic data .....	28
	Cadastral, government and locational data.....	28
	Vegetation .....	28
	Species .....	28
	Wetlands.....	28
	Biodiversity Planning Assessment data .....	28
	Protected areas .....	29
	Imagery.....	29
	Documents available electronically.....	29
	Hard copy maps .....	29

## List of tables

Table 1 Expert panel participants and additional persons consulted in Townsville on 29th June 2011. ....	6
Table 2 Expert panel participants consulted in Atherton on 15th August 2011 and in Townsville on the 26th September 2011. ....	7
Table 3 Summary of flora taxa considered by the expert panel for criteria A and H.....	10
Table 4 Comments and recommendations of expert panel relating to endangered, vulnerable and near -threatened flora species (criterion A) .....	11
Table 5 Comments and recommendations of expert panel relating to other priority flora taxa (criterion H).....	13
Table 6 Priority flora taxa special area decisions .....	15
Table 7 Special features .....	16

## List of figures

Figure 1 Biodiversity Assessment and Mapping Methodology (BAMM) process .....	2
Figure 2 The Gulf plains Bioregion and its subregions.....	4

# 1 Introduction

This report summarises the proceedings and the output of expert panels convened in Townsville on 29th June 2011, Atherton on 15th August 2011 and Townsville on the 26th September 2011 to discuss the biodiversity values of the Gulf Plains Bioregion (GUP) study area (Figure 2). This report documents the panel's findings using the regional ecosystem (RE) mapping Version 8 (released 2/12/2013).

In order to fully capture biodiversity values and to accommodate local knowledge, the following three sets of values were considered for the GUP study area:

- fauna
- flora
- landscape.

Appendix 1 provides details of any abbreviations included in the report.

The Biodiversity Assessment and Mapping Methodology (BAMM, version 2.1) (EPA 2002) has been prepared to provide a consistent approach for assessing biodiversity values at the landscape scale in Queensland using vegetation mapping data from the Queensland Herbarium as a fundamental basis. The data is being used by the Department of Environment and Heritage Protection (EHP) to generate Biodiversity Planning Assessments (BPAs) for bioregions in Queensland.

The BAMM is continually being refined and is published on the EHP website at <[www.ehp.qld.gov.au](http://www.ehp.qld.gov.au)>. The methodology was developed from a similar method initially devised by Chenoweth EPLA (2000), and can be used by agency staff, other government departments, local governments or members of the community to advise on a range of planning or decision making processes.

The methodology is applied in two stages (Figure 1). The first stage uses existing data to assess seven diagnostic criteria, which are relatively uniform and reliable across a bioregion. These account for ecological concepts including rarity, diversity, fragmentation, habitat condition, resilience, threats, and ecosystem processes. They are diagnostic in that they are used to filter available data and provide a 'first-cut' determination of significance. This initial assessment is generated on a geographic information system (GIS) and is then refined using a second group of expert panel criteria. These criteria rely more upon expert opinion than on quantitative data, and focus on data that may not be available uniformly across the bioregion.

Expert panels are convened to review and refine diagnostic criteria and to assess the expert panel criteria (Figure 1). A generalised terms of reference for expert panels is provided in the BAMM version 2.1.

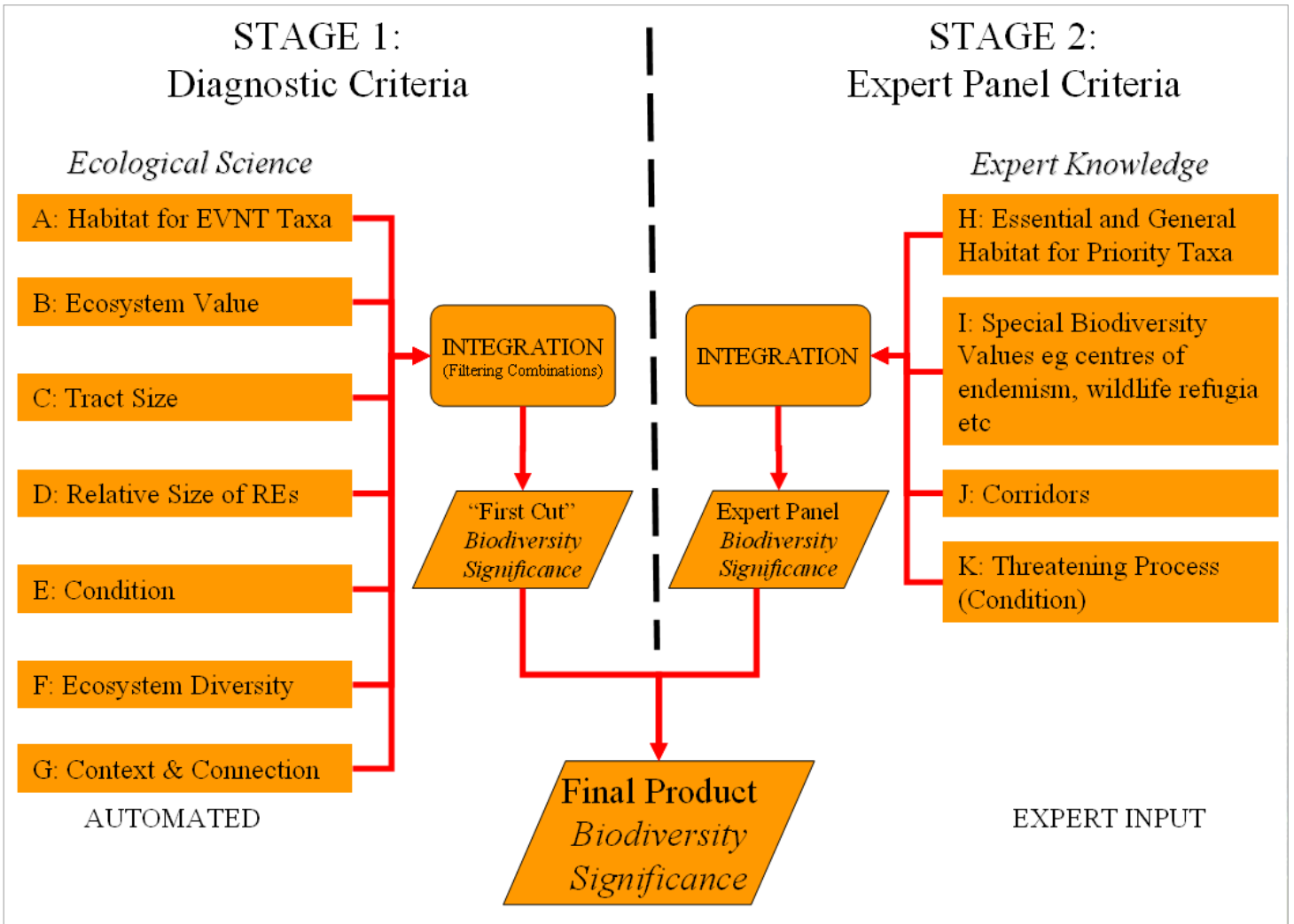


Figure 1 Biodiversity Assessment and Mapping Methodology (BAMM) process

## 2 Method

### 2.1 Study Area

Stretching from the Northern Territory border east to the base of Cape York Peninsula, the Gulf Plains Bioregion encompasses approximately 211,000km<sup>2</sup> of low-lying country and offshore islands of north-west Queensland. Major river systems dissect the broad alluvial plains – the Nicholson, Gregory and Leichhardt drain from the North West Highlands; the Cloncurry, Flinders and Norman from the Mitchell Grass Downs; the Gilbert, Staaten, Nassau and Mitchell from the Einasleigh Uplands.

The coastal edge is dominated by marine plains of clay, silt and sand with mangroves, saltpans and mudflats. Further inland, grasslands and woodlands of eucalypts, melaleuca and acacia cover the landscape of plains and river channels comprising clay and alluvial soils. Similar vegetation dominates the dissected plateau surfaces of sandstones and siltstones that abut the surrounding bioregions (Sattler & Williams 1999).

Fauna of the Gulf Plains has been little studied (e.g. Dames & Moore 1994; Vanderduys & Kutt 2011). One of the few iconic animals is the eastern subspecies of the purple-crowned fairy-wren *Malurus coronatus macgillivrayi* which is restricted to the riparian fringe of major rivers in the western part of the bioregion (Rowley 1993). The general impression of the fauna is one of resilience but relatively limited diversity as one might expect in a landscape prone to extensive flooding with few refugia for dryland species. However the Gulf Plains is critical for wetland taxa. The south-east Gulf of Carpentaria is an internationally important site, and the third most significant site in Australia, for migratory shorebirds using the East Asian-Australasian Flyway (Bamford et al 2008). On the land, the bioregion holds 15 important wetlands (Blackman 2001) which play a vital role as ecological refugia for waterbirds – waterfowl, herons and ibis.

A major environmental pressure on the bioregional biota is the combination of generally flat country and the monsoonal climate that can result in alternating periods of inundation over much of the region during the summer wet season followed by a long dry season in winter. These conditions restrict access both spatially and temporally – limiting any flora and fauna surveys to dry, cooler times of year.

Land-use in the sparsely populated bioregion is primarily cattle grazing and infrastructure support for mines and Gulf of Carpentaria fisheries. The beef industry is based on native grassland pastures and consequently the region has experienced very little clearing of native vegetation compared to more eastern bioregions. Apart from the Staaten River National Park and two small protected areas, the majority of conservation lands are located on or near the periphery of the bioregion.

There are 10 sub-regions within the Gulf Plains Bioregion (Figure 2). The Department of Science, Information Technology, Innovation and Arts (DSITIA) has mapped and classified regional ecosystems (RE) to a peer reviewed and published mapping and classification methodology. These RE maps were used as a platform for the conservation assessments reported here. BPAs accept the released RE maps unmodified and therefore, are limited by inherent mapping and classification accuracy. Issues to do with RE mapping or classification errors are dealt with by DSITIA's mapping update processes and are not part of a BPA.

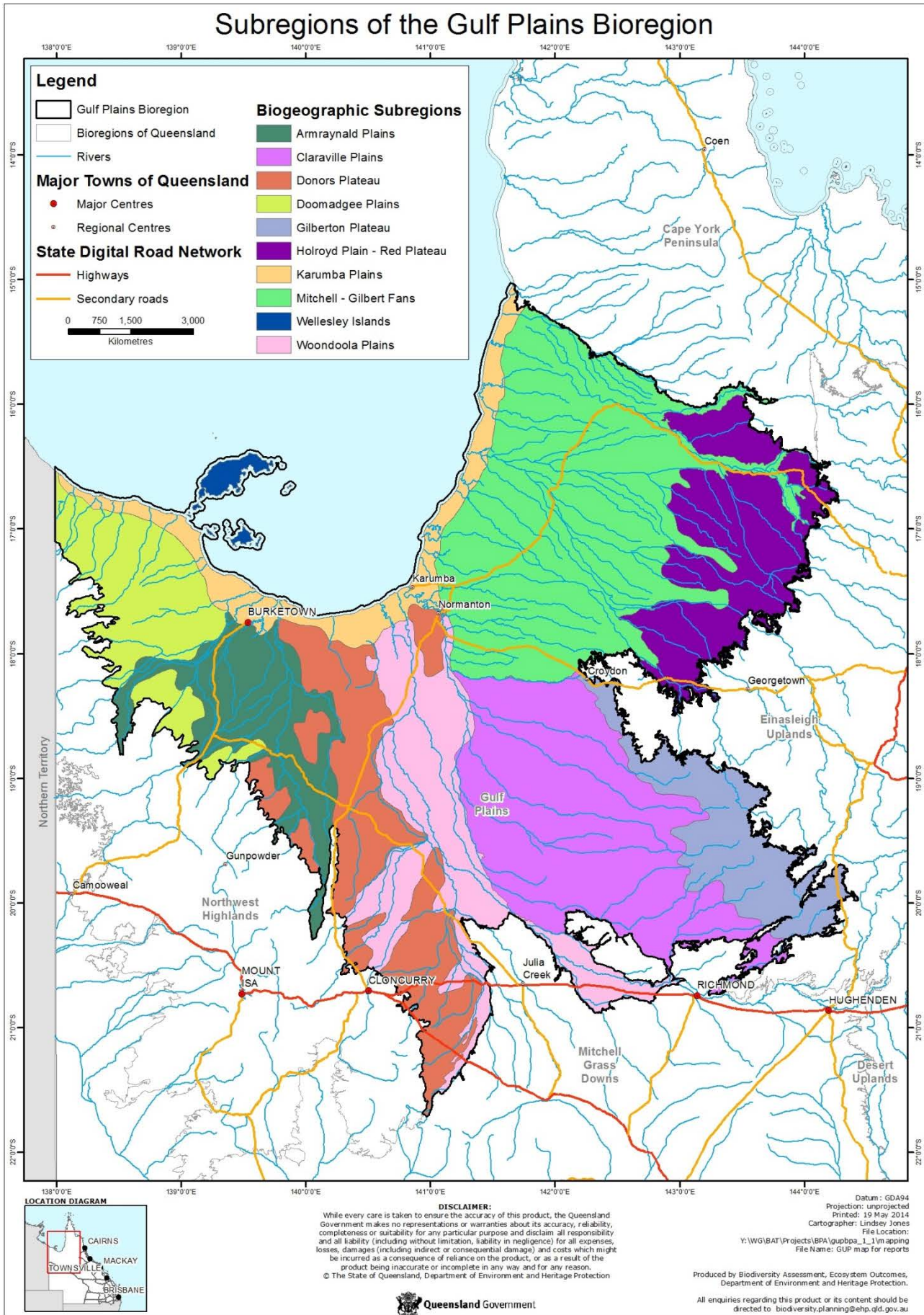


Figure 2 The Gulf plains Bioregion and its subregions



## 2.2 Expert Panel

The expert panel plays a significant role in the development of a BPA through:

- reviewing the suitability of data used in and arising from the GIS analysis;
- identifying other information sources including expert and local knowledge, technical reports and papers, and modelled maps; and
- providing expert opinion where quantitative data is not available uniformly across the bioregion.

Specifically for flora and fauna, the biodiversity issues addressed at panel workshops are:

- evaluating point records for endangered (E), vulnerable (V) and near threatened (NT) taxa to improve spatial accuracy and precision;
- capturing additional records available from expert panel members for subsequent use in criteria A and H;
- identifying areas with special biodiversity values (criteria I) important for the bioregion's fauna;
- identifying non-EVNT taxa to be treated as 'priority species' under criteria H;
- identifying data gaps

The GUP study area expert panel comprised invited persons with knowledge of the biodiversity and/or special biodiversity values of the GUP Bioregion, as well as a sound understanding of ecological conservation and management principles. As far as possible, the combined expertise of participants covered the whole GUP Bioregion and a range of planning and assessment processes (e.g. local government, regional Natural Resource Management (NRM) bodies, state government). The terms of reference for expert panels are provided in Appendix 6 of the BAMB documentation on the EHP website. Additional experts were consulted after the panel workshop and all panel participants are listed in Table 1.

The output of the panel process aims to be justifiable and transparent. Data that is captured digitally and mapped is a result of consensus within the panel and ratified by the Manager, Biodiversity Assessment & Analysis, EHP and the relevant regional manager.

Further, significance ratings of State or Regional are attributed to the decisions produced at the expert panels. In general ratings were only given by the panel to areas of remnant REs, however some small areas of non-remnant vegetation have been given a biodiversity significance rating as part of corridors to improve landscape connectivity.

The ratings used by the panel were described as:

**State significance**—areas assessed as being significant for biodiversity at the bioregional or state scales. They also include areas assessed as being significant at national or international scales

**Regional significance**—areas assessed as being significant for biodiversity at the sub-bioregional scale. These areas have lower significance for biodiversity than areas assessed as being of State significance.

**Table 1 Expert panel participants and additional persons consulted in Townsville on 29th June 2011.**

<b>Name</b>	<b>Organization</b>
Steve Malone	ex Southern Gulf NRMG
Mike Digby	Northern Gulf NRMG
Kelly Gardner	Carpentaria Land Council
Chris Appelman	DERM – Queensland Herbarium
Bruce Wannan	DERM – Northern Region
Gethin Morgan	DERM – Northern Region
Gary Wilson	DERM – Northern Region
Tony Morrison	DERM – Northern Region
Lana Little	DERM - QPWS
<i>Support staff</i>	
Michelle Richards	DERM – Northern Region
Andrew Jolly	DERM – Northern Region
Lindsey Jones	DERM – Head Office
Shane Chemello	DERM – Head Office
Steven Howell	DERM – Head Office

**Table 2 Expert panel participants consulted in Atherton on 15th August 2011 and in Townsville on the 26th September 2011.**

<b>Name</b>	<b>Organisation</b>
<b>Atherton</b>	
Keith McDonald	QPWS – Northern Region
Alistair Freeman	QPWS – Northern Region
Noel Preece	Fauna Consultant
Alf Hogan	Fisheries Consultant
Mike Digby	Northern Gulf NRMG
Debbie Hansen	Northern Gulf NRMG
Charles Curry	Southern Gulf NRMG
Gethin Morgan	DERM – Northern Region
Tony Morrison	DERM – Northern Region
<b>Townsville</b>	
Alex Kutt	CSIRO
Gethin Morgan	DERM – Northern Region
Tony Morrison	DERM – Northern Region

## 2.3 Expert panel format

The flora expert panel workshop used an interactive approach of GIS software, spreadsheets, reports, laptops and data projectors. Prior to the panel being convened, relevant information was collated and disseminated to the workshop participants.

The resources made available to the participants during the workshop proceedings were:

- copy of the BAMB
- available regional ecosystem mapping and 1:100 000 topographic maps
- information from databases such as HERBRECS, CORVEG, WILDNET and the Queensland Museum
- published surveys
- informal sources
- ancillary GIS layers provided for local reference including roads and cadastral information drainage; state forests and national parks with Landsat Thematic Mapper imagery; and digital topographic maps where available.

Appendix 2 provides a full list of the resources made available to the panel at the workshop.

### 2.3.1 Species considerations (criteria A and H)

Flora species considered by the expert panel were EVNT species listed under the Nature Conservation Act 1992 (NCA) or the Australian Government Environmental Protection and Biodiversity Conservation Act 1999 (EPBC) and 'non-EVNT priority taxa' including those identified through the Back on Track species prioritisation framework and other natural resource assessments focused on the bioregion. Records were compiled using WildNet (including HerbreCs), CORVEG, the Queensland Historical Fauna Database and from project-specific data sets obtained from other sources. Other species were nominated, discussed and either added or discarded from the priority taxa list by workshop participants prior to and during the panel workshops. Experts were asked to identify any species with existing models of habitat suitability that could be incorporated into the BPA and to nominate species that they thought possible to generate models for, based on knowledge of species' known preferences for particular habitat features e.g. specific REs, or geology and landscape position. Proposed changes in status under the NCA were also considered.

Species records were interactively reviewed using GIS commencing with EVNT species, followed by non-EVNT priority taxa. Participants were asked to accept, add, shift or exclude records based upon their expert knowledge. Panel participants accepted records located within their known distributions, at known locations or if they were collected by a reliable source. They shifted records that were incorrectly located and added records either during the workshop proceedings or with follow-up consultation.

Records were excluded for the following reasons:

- incorrect coordinates—a mismatch between location description and coordinates
- highly mobile taxa
- records which had obviously been placed at a degree or 10' grid centroid
- duplicate records which had been cited by a number of sources
- records with a precision >2000 metres
- records dated earlier than 1975 – this may be relaxed for the study area.

Individuals were consulted following the workshops to clarify some recommendations and to add records.

#### 2.3.1.1 Habitat for Endangered, Vulnerable and Near-Threatened species (criterion A)

Species records were interactively reviewed on GIS in decreasing order of conservation status: E, V, NT. Experts were asked to accept, add, shift or exclude records based upon their detailed knowledge of those taxa. Species were excluded from the diagnostic analysis when the panel considered there to be a lack of reliable GUP bioregion records, or when species were not known to occur in the GUP bioregion.

These decisions were flagged in the spatial database and in the minutes, which identified the person submitting the information; habitat information and threatening processes for each species; and additional experts to be consulted..

### 2.3.1.2 Core habitat for priority taxa (criterion H)

The panel reviewed a list of non-EVNT fauna and flora species and their associated records, with potential to be endemic and/or have disjunct distributions within the GUP bioregion. Based on the distribution of the records location and expert knowledge, the panel determined whether the species should be considered to have a disjunct and/or endemic distribution with the GUP bioregion.

Other priority taxa are identified for each bioregion on the basis of one or more special values and the written opinion of experts. These values may include:

- taxa at risk or of management concern
- taxa of scientific interest as being relictual (ancient or primitive)
- endemic taxa or locally significant populations (stronghold for taxon)
- highly specialised taxa whose habitat requirements are complex and distributions are not well correlated with any particular RE
- taxa important for maintaining genetic diversity (such as complex spatial patterns of genetic variation, geographic range limits, highly disjunct populations)
- taxa critical for managing or monitoring biodiversity (functionally important or ecological indicators)
- economic and culturally important taxa.

### 2.3.2 Special biodiversity values (criteria I)

The flora panel nominated areas of special flora biodiversity value for inclusion under criteria I. The panel assigned State or Regional significance to the nominated areas on the basis of presence of at least one of the following features:

- criteria Ia—the area supports a number of taxa endemic to the GUP study area
- criteria Ib—wildlife refugia; natural wetland that is in good condition or continues to function as a major wildlife habitat when seasonal conditions permit
- criteria Ic—the area supports a number of taxa that are present in other bioregions and have a limited number of occurrences in the GUP study area (outliers/disjunct populations)
- criteria Id—the area supports a number of taxa at or near the limits of their respective geographical ranges
- criteria Ie—the area supports a high species diversity
- criteria If—the area supports concentrations of relictual (ancient and primitive) taxa
- criteria Ig—the area contains a regional ecosystem or regional ecosystems that exhibit variation in species composition
- criteria Ih—an artificial waterbody or managed/manipulated wetland of ecological significance
- criteria Ii—the area contains a high density of hollow-bearing trees that provide animal habitat
- criteria Ij—the area is used by significant numbers of individuals for roosting or breeding.

The panel took into account combinations of the features present in deciding on an overall rating of State or Regional significance. The diagnostic criteria in BAMM use prescribed thresholds for determining the relative importance of individual criteria, as well as standard rules for assigning significance based on combinations of values present. However, BAMM version 2.1 provides limited guidance on how expert panels are to assess criteria. The GUP Bioregion expert panels used a consensus approach in assigning overall significance. Where there was uncertainty or further work needed, tasks were assigned for follow-up. In some cases the areas were specifically identified by RE polygons, in others a bounding box was drawn as a shape file to indicate the general location of the area, and specific instructions given for the area to be more accurately mapped using RE polygons, geology, landform or some combination of these. Subsequently the areas were mapped, distributed to the expert panel for review, and then finalised.

### 3 Results and discussion

Specific recommendations from the panel are recorded in several tables within the following sections.

#### 3.1 Flora species considerations (criteria A and H)

Criteria A and H attribute significance to areas based on the presence of EVNT taxa scheduled under the Nature Conservation (Wildlife) Regulation 2006 or the EPBC, or presence of non-EVNT priority species. The GUP bioregion flora expert panel considered some 68 taxa for inclusion in criteria A and H. Table 3 summarises the categories of species. It is the general convention under the BAMB that species records are filtered to exclude records older than 1950, or less precise than 2000 metres. The expert panel for the GUP bioregion BPA considered those conventions given that the GUP study area is an almost intact landscape with large areas of homogeneous habitat types and is remote and difficult to access. In many areas, data records for the bioregion are comparatively limited. Given this context, the panel decided to maintain the existing BAMB filter rules. Exceptions were made for a small number of species for which there were very few records. These changes are reflected in comments in the relevant species tables below.

The recommendations were:

- that the year rule be adhered to and records earlier than 1950 be excluded, except in a few isolated cases where records prior to 1950 were deemed suitable for inclusion; and
- that the precision rule be adhered to - only including records up to 2000 metres precision. In a few cases records with precisions greater than 2000 meters were re-examined and a higher (<2000m) precision was recommended following assignment of new coordinates.

**Table 3 Summary of flora taxa considered by the expert panel for criteria A and H**

	Endangered	Vulnerable	Near Threatened	Priority (non-EVNT) taxa	Total
No. of species considered	3	9	19	37	68
No. of species for which the panel made comments	2	6	10	24	42

##### 3.1.1 Habitat for endangered, vulnerable and near threatened flora species (criteria A)

The panel reviewed records of the listed EVNT species and provided comments on those species (Table 4). The panel nominated one EVNT species with potential for habitat modelling. A number of species were excluded because there were either no, or too few reliable records of the species in the GUP bioregion.

**Table 4 Comments and recommendations of expert panel relating to endangered, vulnerable and near - threatened flora species (criterion A)**

Family	Scientific name	Common name	NCA1	EPBC2	Comments and recommendations
Mimosaceae	<i>Acacia armitii</i>		NT		
Mimosaceae	<i>Acacia crombiei</i>	pink gidgee	V	V	Harvested for wood turning.
Mimosaceae	<i>Acacia ramiflora</i>		C	V	
Mimosaceae	<i>Acacia tenuinervis</i>		NT		
Poaceae	<i>Aristida burraensis</i>		NT		
Poaceae	<i>Arthragrostis clarksoniana</i>		NT		
Cycadaceae	<i>Cycas couttsiana</i>		NT		
Orchidaceae	<i>Dendrobium johannis</i>	brown antelope orchid	V	V	Mainly Errk Oykangand NP.
Fabaceae	<i>Desmodium macrocarpum</i>		NT		Check distribution.
Rutaceae	<i>Drummondita calida</i>		V		Primarily sandstone country.
Poaceae	<i>Ectrosia blakei</i>		V	V	Now known to be more widespread.
Eriocaulaceae	<i>Eriocaulon carsonii</i>		E	E	Need to check Rod's spring data. Possibly keep the subspecies.
Eriocaulaceae	<i>Eriocaulon carsonii</i> subsp. <i>orientale</i>		E		
Cyperaceae	<i>Fimbristylis micans</i>		NT		Normanton area, poorly collected.
Cyperaceae	<i>Fimbristylis odontocarpa</i>		NT		Widespread specialised habitat, depressions in melaleuca country.
Poaceae	<i>Heterachne baileyi</i>		NT		
Caesalpiniaceae	<i>Labichea brassii</i>		NT		Sandstone species.
Myrtaceae	<i>Leptospermum pallidum</i>		NT		Sandstone species.

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1 Queensland *Nature Conservation Act 1992* (E – endangered, V – vulnerable, NT – near threatened, LC – least concern)

2 *Environment Protection and Biodiversity Conservation Act 1999* (CE – Critically Endangered, E – endangered, V – vulnerable, EX - Extinct)

Family	Scientific name	Common name	NCA1	EPBC2	Comments and recommendations
Combretaceae	<i>Macropteranthes montana</i>		V	V	Small patches. Also found in Einasleigh Uplands bioregion.
Rubiaceae	<i>Oldenlandia spathulata</i>		E		Three locations only - needs wet season survey.
Poaceae	<i>Paspalidium scabrifolium</i>		NT		
Poaceae	<i>Paspalum multinodum</i>		NT		Found only on Sweers Island at this stage; poorly known.
Asteraceae	<i>Peripleura scabra</i>		NT		Mainly GUP outlier regional ecosystems in Einasleigh Uplands bioregion.
Polygalaceae	<i>Polygala pycnantha</i>		NT		Errk Oygangand NP, poorly known.
Scrophulariaceae	<i>Rhamphicarpa australiensis</i>		NT		Widespread.
Fabaceae	<i>Sesbania erubescens</i>		NT		Wetlands areas, patchy across the gulf, heavily grazed.
Solanaceae	<i>Solanum carduiforme</i>		V	V	Sandstone rugged area specialist, occurring in difficult to access areas.
Stemonaceae	<i>Stemona angusta</i>		V	V	
Stylidiaceae	<i>Stylidium trichopodum</i>		NT		
Araliaceae	<i>Trachymene glandulosa</i>		V		
Campanulaceae	<i>Wahlenbergia islensis</i>		NT		



### 3.1.2 Core habitat for priority flora taxa (criterion H)

Priority species are non-EVNT species that are considered to be of particular conservation significance. The rationale for this significance may relate to:

1. taxa of management concern
2. taxa of scientific interest
3. endemic taxa or locally significant populations (such as a flying fox camp or heronery)
4. taxa with highly specialised habitat requirements
5. genetically important taxa
6. environmental indicator taxa
7. taxa that have economic or cultural importance.

A draft list of species was considered by the panel and one species was excluded either because there were no, or too few reliable records of the species in the GUP study area. Additional species were also identified and the final list of priority species recommended by the panel is shown in Table 5.

For inclusion in the BPA the records were first subject to filtering rules for age of record and precision as applied to records for criteria A (see BAMB documentation, EPA 2002). Subsequently, for species of State significance, high precision records (precision  $\leq$  500 metres) were buffered by twice the precision (as for criteria A) with a minimum of 300 metres and assigned VERY HIGH in criteria H. For species of Regional significance, high precision records (precision  $\leq$  500 metres) were buffered by twice their precision (as for criteria A) with a minimum of 300 metres and assigned HIGH in criteria H. For low precision State and low precision Regional significant species, the point records were buffered by 1000 metres and assigned MEDIUM in criteria H. These decision rules are summarised in Table 6.

**Table 5 Comments and recommendations of expert panel relating to other priority flora taxa (criterion H)**

Family	Scientific name	Common name	Rationale and Comments	Significance
Mimosaceae	<i>Acacia meiosperma</i>		6	Regional
Mimosaceae	<i>Acacia orthocarpa</i>		6	Regional
Aponogetonaceae	<i>Aponogeton queenslandicus</i>		4,5,6 Back on Track listing of Medium	Regional
Convolvulaceae	<i>Bonamia sp (Croyden K.R . McDonald KRM 4000)</i>		6	State
Myrtaceae	<i>Corymbia citriodora</i>	lemon-scented gum	6,7,9 High Vulnerability to climate change (Low, 2011).	State
Myrtaceae	<i>Corymbia gilbertensis</i>	Gilbert River ghost gum	6 High Vulnerability to climate change (Low, 2011).	Regional
Myrtaceae	<i>Corymbia serendipita</i>		3	State
Myrtaceae	<i>Corymbia setosa subsp. setosa</i>		3 Widespread across Nth Aust including NT – found in a variety of habitats.	State
Myrtaceae	<i>Corymbia stockeri subsp. stockeri</i>		4,6	Regional

Family	Scientific name	Common name	Rationale and Comments	Significance
Fabaceae	<i>Crotalaria inaequalis</i>	Croydon rattlepod	3	Regional
Myrtaceae	<i>Eucalyptus brassiana</i>		6	State
Myrtaceae	<i>Eucalyptus megasepala</i>		6	Regional
Myrtaceae	<i>Eucalyptus miniata</i>	Darwin woollybutt	6 High Vulnerability to climate change (Low, 2011).	Regional
Myrtaceae	<i>Eucalyptus platyphylla</i>	poplar gum	1,2,4,7 High Vulnerability to climate change (Low, 2011).	Regional
Myrtaceae	<i>Eucalyptus provecta</i>		6	Regional
Myrtaceae	<i>Eucalyptus tardecidens</i>		4,6	State
Myrtaceae	<i>Eucalyptus tectifera</i>	Darwin box	3 High Vulnerability to climate change (Low, 2011).	Regional
Sparrmanniaceae	<i>Grewia mesomischa</i>		6	Regional
Myrtaceae	<i>Melaleuca saligna</i>		6 High Vulnerability to climate change (Low, 2011).	Regional
Myrtaceae	<i>Neofabribricia mjoebergii</i>		4,6	Regional
Nyctaginaceae	<i>Pisonia grandis</i>		4,6,9	State

**Table 6 Priority flora taxa special area decisions**

Decision Number	Description	Significance	Identified values	Criteria values
gup_fl_19	High precision records for priority taxa of State significance are contained within the remnant.	State	Remnant contains core habitat for priority taxa with high precision records.	Criteria H: VERY HIGH
gup_fl_20	High precision records for priority taxa of Regional significance are contained within the remnant.	Regional	Remnant contains habitat for priority taxa with high precision records.	Criteria H: HIGH
gup_fl_21	Low precision records for priority taxa of State significance are contained within the remnant.	State	Remnant contains core habitat for priority taxa with low precision records.	Criteria H: MEDIUM
gup_fl_22	Low precision records for priority taxa of Regional significance are contained within the remnant.	Regional	Remnant contains habitat for priority taxa with low precision records.	Criteria H: MEDIUM

### 3.2 Special biodiversity values (criterion I)

The panel was asked to identify areas with special biodiversity values within the GUP bioregion under the BMM supplementary criterion I. Areas with special biodiversity value are important because they contain multiple taxa in unique ecological and often highly biodiverse environments. Values can include centres of endemism, wildlife refugia, disjunct populations, geographic limits of species distributions, high species richness, relictual populations, high densities of hollow-bearing trees and breeding sites. Using expert knowledge and available information (records, maps, GIS derived datasets), panel members were able to identify eleven areas and describe their collective values. The special areas proposed by the panel are described in Table 7.

The ratings used for diversity of species of conservation significance (EVNT and priority spp.) are:

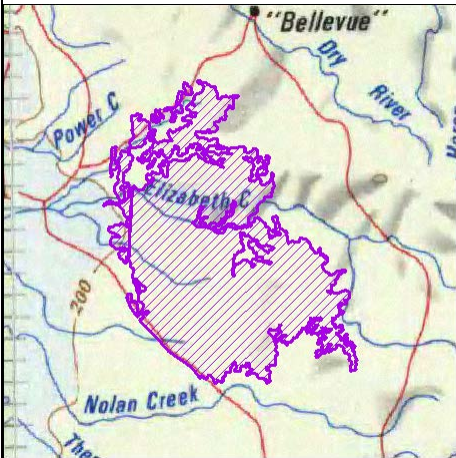
- very high (>25 per cent of GUP bioregion spp)
- high (10–25 per cent of GUP bioregion spp)
- medium (>10 per cent of GUP bioregion spp)
- low (no data).

Only EVNT and priority species are specified for each decision.

**Table 7 Special Features**

Decision number	Description	Panel recommended significance	Identified values in BPA	Criteria values
01	Bang Bang Jump Up Implemented as landscape decision - gup_I_15	State	Lateritic in nature. Floristic values are mainly on slopes below duricrust. Sandy loose low grade material. Ecosystem complex with gullies.  The area has restricted endemic species and high species richness. Springs imbedded. Wildlife refugia.  Representative suite of REs and surfaces for that part of the Donors Plateau. Best example of those landscapes.	Ia (centre of endemism): VERY HIGH  Ib (wildlife refugia): VERY HIGH  Ie (high species diversity): VERY HIGH  Ig (REs show distinct variation in species composition): HIGH  Ij (significant breeding or roosting sites): HIGH

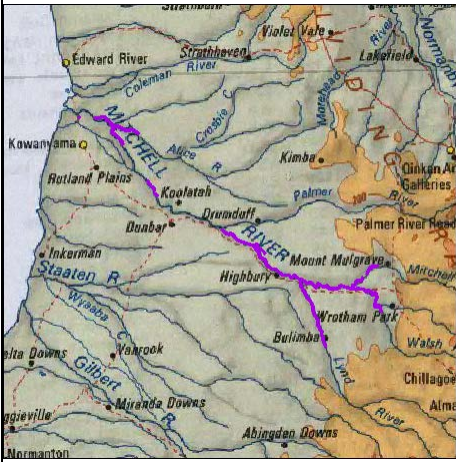
Decision number	Description	Panel recommended significance	Identified values in BPA	Criteria values
02	<p>Chudleigh Plateau</p> <p>Implemented as landscape decision - gup_I_32</p>	State	<p>High plateaux covered with sandsheets harbouring a suite of species with restricted distribution in the bioregion and unique and restricted ecosystems. Ecosystems are slightly taller on top of Juntala Plateau. The area is a climate refugia.</p> <p>Species diversity high at breakaways around sides of the plateaux. Fire protected niche.</p> <p>Extensions of EIU species.</p> <p>Springs: there are discharge areas running around side for 4-5 months per year and surrounding springs.</p>	<p>Ib (wildlife refugia): VERY HIGH</p> <p>Ic (disjunct populations):VERY HIGH</p> <p>Id (species at geographic range limit):VERY HIGH</p> <p>Ie (high species diversity):HIGH</p> <p>Ig (REs show distinct variation in species composition): HIGH</p>
03	<p>Lower Lynd River area. Blackdown /Torwood / Bulimba property area.</p> <p>Implemented as landscape decision - gup_I_12</p>	State	<p>An area with a large number of ecosystems and climatically unique with respect to flora..</p> <p>Highly diverse landscape consisting of undulating mudstone, laterised mudstone and tertiary sandstones. Only occurrence in the GUP. Diverse and restricted REs.</p> <p>High number of species extensions of range.</p>	<p>Ia (centre of endemism): VERY HIGH</p> <p>Ib (wildlife refugia): VERY HIGH</p> <p>Ic (disjunct populations):VERY HIGH</p> <p>Id (species at geographic range limit): VERY HIGH</p> <p>Ie (high species diversity): VERY HIGH</p> <p>Ig (REs show distinct variation in species composition):VERY HIGH</p>

Decision number	Description	Panel recommended significance	Identified values in BPA	Criteria values
gup_fl_04	Elizabeth Creek gorge and adjacent tableland areas 	State	<p>Elizabeth Creek is a perennial creek maintained by spring-fed wetlands. Presence of rhyolite grasslands (EIU outlier). Area of unusual REs - atypical species and ecosystems, with altitude and moisture gradients and within sheltered valleys. Species present include mangrove ferns <i>Acrostichum</i> sp.</p> <p>Tops are dominated by <i>E. similis</i> and wetlands at rhyolite sandstone interface.</p> <p>Includes <i>Melaleuca leucadendra</i> forest wetlands.</p> <p>Culturally significant: contains petroglyph and rock art.</p>	Ic (disjunct populations): VERY HIGH Id (species at geographic range limit): VERY HIGH Ie (high species diversity): VERY HIGH
05	Wellesley Islands Implemented as landscape decision - gup_l_13	State	An outstanding refuge from impacts of cattle grazing, although there are small numbers of cattle and brumbies on Mornington Island now. There is a lack of RE mapping for the islands.	Ib (wildlife refugia): VERY HIGH

Decision number	Description	Panel recommended significance	Identified values in BPA	Criteria values
06	Westmoreland Plains Implemented as landscape decision - gup_l_16	State	Boundary area extends inland to pick up high diversity of landscapes. Good representation of the north western part of bioregion. Longstanding National Park proposal.  Outwash sandy plains floristically diverse.	Ia (centre of endemism): VERY HIGH Ib (wildlife refugia): VERY HIGH Id (species at geographic range limit): VERY HIGH Ie (high species diversity): VERY HIGH Ig (REs show distinct variation in species composition): VERY HIGH Ii (high density of hollow-bearing habitat trees): HIGH Ij (significant breeding or roosting sites): HIGH

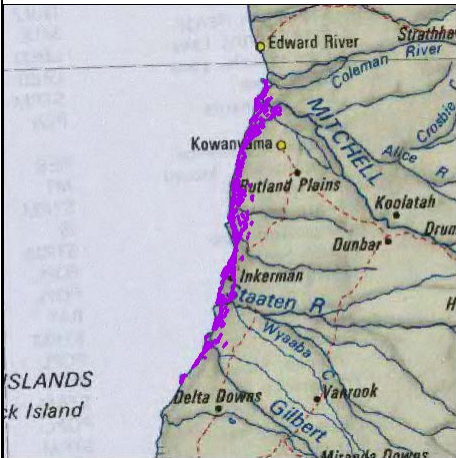
Decision number	Description	Panel recommended significance	Identified values in BPA	Criteria values
07	<p>Karumba Plains</p> <p>Implemented as landscape decision - gup_l_01 (western)</p> <p>Implemented as landscape decision - gup_l_02 (central)</p> <p>Implemented as landscape decision - gup_l_03 (eastern)</p>	State	<p>Marine plains area all around gulf. Goes from marine grassland gradation to woodlands. Most extensive example of gradational marine transition in the country. Wetlands ranging from fresh to salt.</p> <p>Western section rapidly pro-grading. Western area has different dominant species and much more intricate mosaic of habitats.</p> <p>From Karumba north, very diverse with many ecosystems.</p> <p>Unique vegetation types recorded on southern part of Karumba Plains subregion.</p> <p>Complexity of community mosaic. Richness of REs.</p> <p>Ridgelines throughout plains are refugia.</p> <p>The marine plains, grassland and saltmarshes of the lower Flinders, Norman and Gilbert rivers identified as special areas (fl_nr_fl03, gi_nr_fl_02, nn_nr_fl_02, fl_e_fl_01, gi_e_fl_01 and nn_e_fl_01) with very high (4) conservation rating in southern Gulf of Carpentaria ACA (Rollason and Howell 2010).</p>	<p>lb (wildlife refugia): VERY HIGH</p> <p>le (high species diversity): VERY HIGH</p> <p>lg (REs show distinct variation in species composition): VERY HIGH</p> <p>lj (significant breeding or roosting sites):VERY HIGH</p>



Decision number	Description	Panel recommended significance	Identified values in BPA	Criteria values
08	Rosser Creek Implemented as landscape decision - gup_I_04	State	<p>Thick riparian belts. Flying fox scrub near Horse Creek. Based on Strathallan block. Landscape residuals of land zone 5 overlying laterized mudstone. If soil depth is sufficient then supports scrubs, if too shallow then melaleuca woodland. Vine thickets, including flying fox scrub. Presence of <i>Asteromyrtus</i> shrublands, impressive riparian area, rare vegetation types, and species with range extensions from west and east.</p> <p>Environment is in good condition being little affected by grazing, however some significant weed issues. Rivers are in reasonable condition. Mixture of patterns – full spectrum of stripped surface. Shrublands with unusual geology/geomorphology. Increased water along creeks. Not subject to major flooding as limited catchment. Obviously different from surroundings, different wattle species.</p>	lb (wildlife refugia): HIGH le (high species diversity): VERY HIGH lg (REs show distinct variation in species composition):VERY HIGH lj (significant breeding or roosting sites):VERY HIGH
gup_fl_09	Mitchell delta flooded evergreen notophyll forest. 	State	<p>Riparian forest, notophyll flood forest. Not diverse but floristically restricted. Very few vines. Best example of this ecosystem within bioregion. Generally Alice Mitchell frontage unusual. Green patch SE of south arm closed forest with eucalypt emergents. Some melaleuca thickets.</p> <p>Highly active part of Mitchell delta. Floods each year.</p> <p>Currently in good condition, however the weed <i>Heliotropium indicum</i> is around some lagoon wetlands.</p> <p>Good fishing – popular with locals.</p>	la (centre of endemism): VERY HIGH lb (wildlife refugia): VERY HIGH le (high species diversity): VERY HIGH lg (REs show distinct variation in species composition): VERY HIGH

Decision number	Description	Panel recommended significance	Identified values in BPA	Criteria values
10	Surprise Creek area Implemented as landscape decision - gup_l_42	State	<p>Very high flora and landscape diversity.</p> <p>Extremely diverse area on Doomadgee plains outlier, diverse shrublands and contains a 'Rare' RE, entire distribution of which is contained in this area. Dune areas also present. Contains the only landzone 6 in Gulf Plains but consists of mainly landzone 5.</p> <p>Mine dewatering may go down Archie Creek.</p> <p>Archie creek has increased rubber vine <i>Cryptostegia grandiflora</i> which extends into plains.</p> <p>Possibly subject to high grazing pressure therefore condition could be an issue.</p>	<p>le (high species diversity): VERY HIGH</p> <p>Ig (REs show distinct variation in species composition):VERY HIGH</p>
11	Dalgonally Swamp Implemented as landscape decision - gup_l_06	Regional	<p>Very wet grassland which is atypical for the system. Confined floodplain. The lowest part in the area and the water pools here is a refuge and stays wet for a long period. Most of the other wetlands in this area dry out quickly. Significant pig populations. Not so much standing water as it is staying damp for extended periods.</p>	<p>Ib (wildlife refugia): HIGH</p> <p>Ig (REs show distinct variation in species composition):VERY HIGH</p> <p>Ih (artificial waterbody or managed/manipulated wetland of ecological significance): HIGH</p>
12	Gidgee communities, central Donors Plateau. Implemented as landscape decision - gup_l_15	Regional	<p>Area of high diversity of gidgee communities including restricted type with deep gilgai on yellow clays.</p> <p>Strong floristic differences. Three to four different types of gidgee substrate. Soils quite restricted.</p> <p>Refugia for species.</p> <p>Recent clearing in area.</p>	<p>Ib (wildlife refugia): HIGH</p> <p>Ig (REs show distinct variation in species composition):VERY HIGH</p>

Decision number	Description	Panel recommended significance	Identified values in BPA	Criteria values
13	Murgulla sandsheets Implemented as landscape decision - gup_l_15	State	Wetlands, patches of scrub on wetland margins. Disjunct arid flora e.g. <i>Corymbia terminalis</i> . Complex sand sheet with wetlands and lateritic surfaces. Mainly land zone 5 with windows to underlying clays. Old surface with residual arid species.	Ib (wildlife refugia): VERY HIGH Id (species at geographic range limit): HIGH Ie (high species diversity): VERY HIGH Ig (REs show distinct variation in species composition): VERY HIGH
14	Mt Fort Bowen Implemented as landscape decision - gup_l_39	Regional	Biogeographic outlier of Pre Cambrian basement rocks forming an inselberg rising abruptly up to 40m above the surrounding clay plains. Metasediment range surrounded by spring fed alluvial systems. Status of springs and condition of surrounding plains unknown.	Ib (wildlife refugia): VERY HIGH Ic (disjunct populations): VERY HIGH Id (species at geographic range limit): HIGH Ie (high species diversity): HIGH Ig (REs show distinct variation in species composition): HIGH
15	Coastal Casuarina woodlands		Highly restricted, fire sensitive, subject to weed incursion (particularly rubber vine <i>Cryptostegia grandiflora</i> and calotrope <i>Calotropis procera</i> ). The Finucane Island NP population is particularly isolated and management of rubber vine and calotrope weed is being undertaken.	

Decision number	Description	Panel recommended significance	Identified values in BPA	Criteria values
gup_fl_16	Coastal dry rainforest thickets 	State	Highly restricted, unmapped.	Ig (REs show distinct variation in species composition): VERY HIGH
17	Vine forest at heads of sheltered valleys. Implemented as landscape decision - gup_l_13	State	Rainforest patches, i.e. small areas in heads of creeks/springs just below plateau (Wellesley Islands - Mornington Island).	
18	River red gum – Leichhardt pine forest fringing major tributaries Implemented as landscape decision - gup_l_13	State	Riparian RE 2.3.26 (River red gum <i>E. camaldulensis</i> – Leichhardt pine <i>Nauclea orientalis</i> forest fringing major tributaries) is inferred to occur on the Wellesley Islands (Morgan 1999; Perry et al. (unpublished), supports this inference by describing riparian vegetation on Mornington Island as being present on the alluvial flats associated with creeks that flow from the west into: <ul style="list-style-type: none"> <li>• Toongoowahgun Inlet,</li> <li>• Kungunmeah (Gangenmerr River), and</li> <li>• Ngulwonmeah (Ngulwange) River.</li> </ul>	

### 3.3 Data collection

Data collection has not been spatially uniform with regards to species records. Many areas are under-surveyed relative to areas with high densities of records and known values. Poorly sampled areas can be identified relatively easily using species record datasets. Areas such as roads are clearly more heavily sampled, while ranges and escarpments and interior parts of major floodplain wetland systems are underrepresented and should be the focus of future survey effort. Access to private lands may be more achievable in the future by forming joint projects with the Northern and Southern Gulf NRM Groups.

### 3.4 Data access and conditions

The public will be able to access the information contained in the BPA on the Queensland Government Spatial Catalogue website at <http://qldspatial.information.qld.gov.au>. Specific details for point records will not be included, thus end users will need to seek further advice from EHP when this detail is required.

## 4 Summary

The flora expert panel has made a significant contribution to biodiversity assessment and planning in the GUP bioregion. Refining and validating existing species records, and providing additional records for the bioregion, could not have been achieved without the cooperation of these experts and their local expert knowledge. Similarly the identification of areas significant for flora could not have been as comprehensively completed without the help and guidance of the expert panel. Habitat information provided by panel members will be used to model the distribution of three rare and threatened flora species in the GUP bioregion, which will be included in future versions of the BPA.

The resulting planning assessment and associated species database is now a useful basis for a variety of applications including the protection and management of areas of high conservation value, development assessment, local government planning, vegetation management and internal EHP directions.

However the panel wished it emphasised that the distribution and abundance of flora in the bioregion is still very poorly known, and existing data is biased towards public reserves such as national parks, State forests and road reserves. Systematic survey of most of the bioregion is urgently needed to properly understand the nature and distribution of its flora. This report should be viewed as the best information currently available, but by no means should it be considered comprehensive.

The flora expert panel process will be revisited on a regular basis. An appropriate review timeframe would be approximately every two years to coincide with a new release of Queensland Herbarium RE mapping.

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## Appendix 1 Acronyms and abbreviations

ACA	Aquatic Conservation Assessment
BAMM	Biodiversity Assessment and Mapping Methodology
BPA	Biodiversity Planning Assessment
BVG	Broad Vegetation Group
CAMBA	Agreement between the Australian Government and the government of the People's Republic of China for the Protection of Migratory Birds and their Environment
CORVEG	The site survey database maintained by the Queensland Herbarium
DCDB	Digital Cadastral Database—a spatial database of Queensland property boundaries
EHP	Department of Environment and Heritage Protection
EVNT	Endangered, vulnerable or near threatened under the Queensland Nature Conservation Act (1992) and Commonwealth Environment Protection and Biodiversity Conservation Act (1999)
EPA	Environmental Protection Agency (former Queensland Government department)
EPBC	Environmental Protection and Biodiversity Conservation Act 1999
GCDI	Ground Cover Disturbance Index
GIS	Geographic information system
GUP	Gulf Plains Bioregion
HERBRECS	Specimen based register of plants held by Queensland Herbarium
JAMBA	Agreement between the Australian Government and the Japanese Government for the protection of migratory birds in danger of extinction and their environment
NCA	Nature Conservation Act 1992
NPRSR	Department of National Parks, Recreation, Sport and Racing
QPWS	Queensland Parks and Wildlife Service (an agency within Department of National Parks, Recreation, Sport and Racing)
RE	Regional ecosystem
REDD	Regional Ecosystems Description Database
SDRN	State Digital Road Network
SLATS	State-wide Landcover and Trees Study
WILDNET	Department of Science, Information Technology, Innovation and the Arts (DSITIA)'s corporate wildlife application containing records and other information on Queensland flora and fauna

## Appendix 2 Datasets available to the expert panel during the workshop

### GIS

#### Geographic data

Catchment boundaries

Contours (10m interval)

Topographic maps (1:100 000).

#### Cadastral, government and locational data

Cadastral data (DCDB) for GUP study area local government areas

Local government boundaries

Pastoral holdings database

Places

Towns

State Digital Road Network (SDRN)

Stockroutes.

#### Vegetation

Regional Ecosystem Description Database (REDD)

Draft pre-clearing vegetation

Draft remnant (RE07) RE mapping

Certified updates to remnant mapping.

#### Species

All fauna species records were obtained from Queensland Historical Fauna database. Flora species records were obtained from HerbreCs, WildNet and Corveg databases

BriMapper (HerbreCs species records viewer).

#### Wetlands

Queensland Wetland Mapping

Directory of Important Wetlands

Drainage network—rivers

Drainage network—creeks.

#### Biodiversity Planning Assessment data

Queensland bioregion and subregion boundaries

Terrestrial and riparian state bioregional corridors

Results from EIU bioregion BPA v1.1.

Results from MGD bioregion BPA v1.1.



## **Protected areas**

EPA estates

Nature refuges

Coordinated conservation areas.

## **Imagery**

2009 Landsat mosaic of the GUP bioregion

SPOT imagery (10 metres).

## **Documents available electronically**

EPA (2002) Biodiversity Assessment and Mapping Methodology version 2.1 July 2002.

## **Hard copy maps**

Landsat 7 mosaic of GUP bioregion

GUP bioregions and subregions (Queensland).