A Biodiversity Planning Assessment for the Southeast Queensland Bioregion

Fauna Expert Panel Report

Version 4.1

Queensland Government

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Citation

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1 Introduction

This report summarises the proceedings and output of the expert fauna panel convened in Brisbane on 1st December 2015 to discuss the biodiversity values of the Southeast Queensland (SEQ) bioregion. This report documents the panel's findings using the regional ecosystem (RE) mapping dated Version 9 (April 2015).

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

- fauna
- flora
- landscape.

The Biodiversity Assessment and Mapping Methodology (BAMM, version 2.2) (EHP 2014) was developed to provide a consistent approach for assessing biodiversity values at the landscape scale in Queensland using vegetation mapping data generated or approved by the Queensland Herbarium as a fundamental basis. It 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>. 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 inform 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 2.2.

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

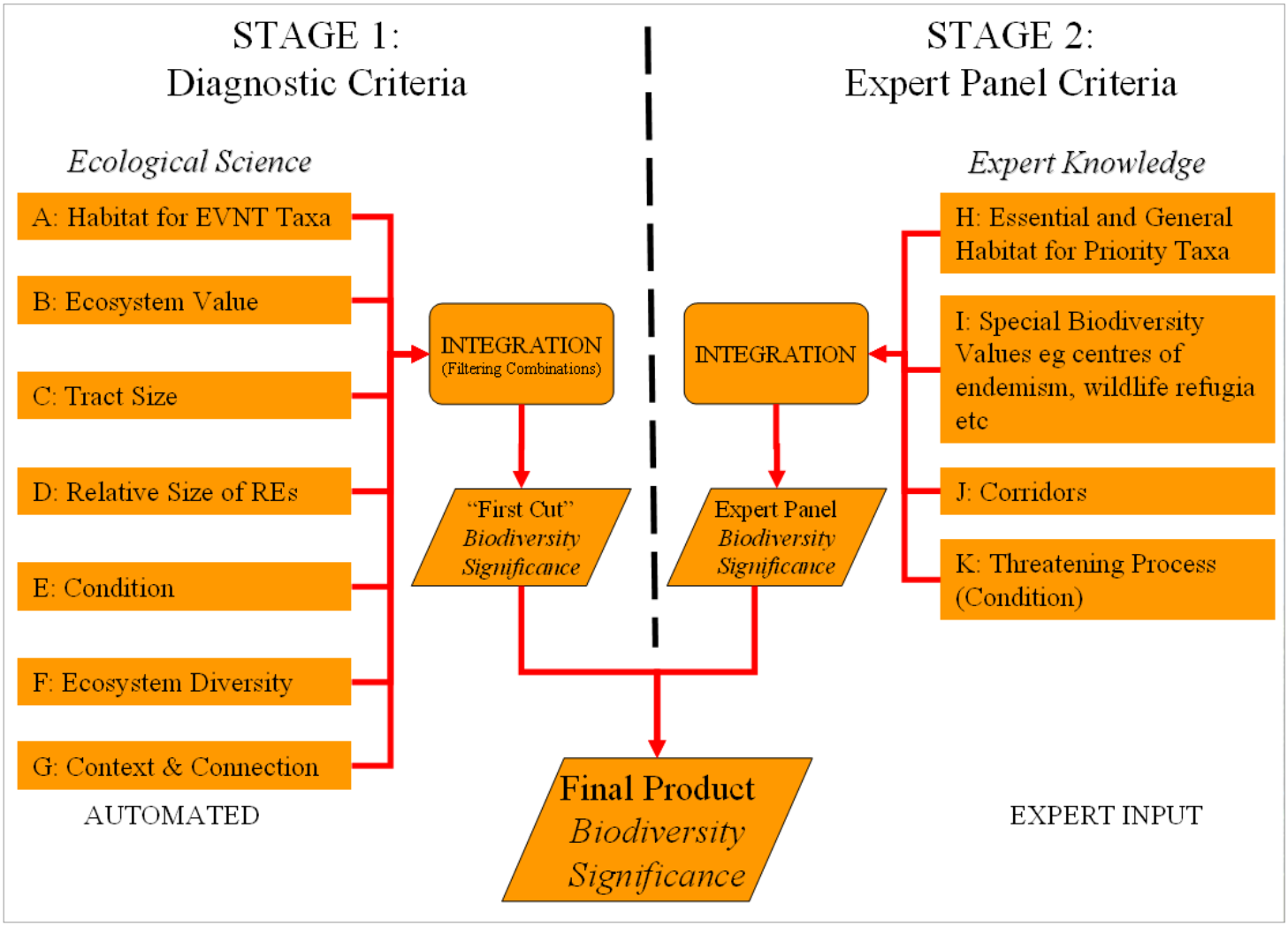


Figure 1 Biodiversity Assessment and Mapping Methodology (BAMM) process

2 Method

2.1 Study Area

The SEQ Bioregion shares its western boundary with the Brigalow Belt Bioregion, and extends from the New South Wales border north to the dry coastal corridor between Gladstone and Rockhampton that forms part of the Brigalow Belt Bioregion (Figure 2). The McPherson Range borders the southern boundary of the bioregion while the Great Dividing Range is to the west. Ranges extend north south through the central region creating an altitudinal gradient from the coast. Small volcanic plugs remain in the landscape offering distinctive conditions for taxa. Large sand islands off the coast offer unique environments and create sheltered bays and passages within which marine and coastal plants and animals thrive.

Southeast Queensland has a humid sub-tropical climate with mild winters and warm, wet summers. It is the most densely populated area of Queensland, with over 70% of the state's population (Queensland Treasury 2015), and is subject to a range of land uses including grazing, nature conservation, irrigated agriculture, urban uses (including industrial and residential) and rural living. The region's major agricultural products include dairy, fodder crops, cereal and a variety of horticultural produce.

Straddling the Torresian and Bassian faunistic divisions, with montane isolates, e.g. Bunya Mountains and Kroombit Tops, typical of the more southern Tumbunan division (Schodde 1986), SEQ contains a diverse combination of landforms, soils and climate (Sattler & Williams 1999). The resultant high habitat diversity is reflected in an equally high animal diversity with records for over 880 freshwater and terrestrial vertebrate species (McFarland 1998). This represents nearly 53% of the species known to occur in Queensland and in terms of terrestrial taxa rivals the Wet Tropics Bioregion (610 taxa - Williams et al. 1996). The region is a centre of species richness for several invertebrate and vertebrate groups including *Euastacus* crayfish (Furse et al. 2013), papilionoid butterflies (Kitching 1981), land snails (Stanisic et al. 2010), frogs (Roberts 1993), chelid turtles (Legler & Georges 1993), elapid snakes (Longmore 1986), scincid lizards (Cogger & Heatwole 1981), birds and marsupials (Pianka & Schall 1981).

An equitable climate and high growth index throughout the year (Nix 1974) attracts considerable numbers of migrant birds from both the south in winter, e.g. silvereye *Zosterops lateralis* and yellow-faced honeyeater *Lichenostomus chrysops*, and from the north in summer, e.g. flycatchers *Myiagra* and *Monarcha* spp. kingfishers *Todiramphus* spp. and a large suite of wader species. While numerous taxa reach either their southern or northern distribution limits (e.g. northern quoll *Dasyurus hallucatus*, olive whistler *Pachycephala olivacea*) in SEQ, the region also has concentrations of endemics in both montane (e.g. Kroombit tinkerfrog *Taudactylus pleione*, red-and-yellow mountainfrog *Kyarranus kundagungan, Euastacus jagara*) and coastal sandmass (acid frog group, honey blue-eye *Pseudomugil mellis*) habitats. There are also relictual taxa (e.g. Australian lungfish *Neoceratodus forsteri*) and those with disjunct populations (e.g. whirring treefrog *Litoria revelata*, jungle perch *Kuhlia rupestris*).

The region contains the most urbanised parts of Queensland but also some of the most exceptional natural areas in the state, including the Gondwana Rainforests of Australia and Fraser Island World Heritage Areas. The main pressure on the environment in SEQ is the impact of rapid population growth and concomitant growth of services that fragment the landscape. Other important threats are unsustainable land management practices, native vegetation clearing, point source and diffuse pollutants (from urban, industrial and agricultural areas) entering waterways and the impacts of introduced plants and animals.

There are 12 sub-regions within the Southeast Queensland Bioregion (Sattler & Williams 1999, Figure 2). The Department of Science, Information Technology and Innovation (DSITI) 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 the REs inherent mapping and classification accuracy. Issues to do with RE mapping or classification errors are dealt with by DSITI’s mapping update processes and are not part of a BPA.

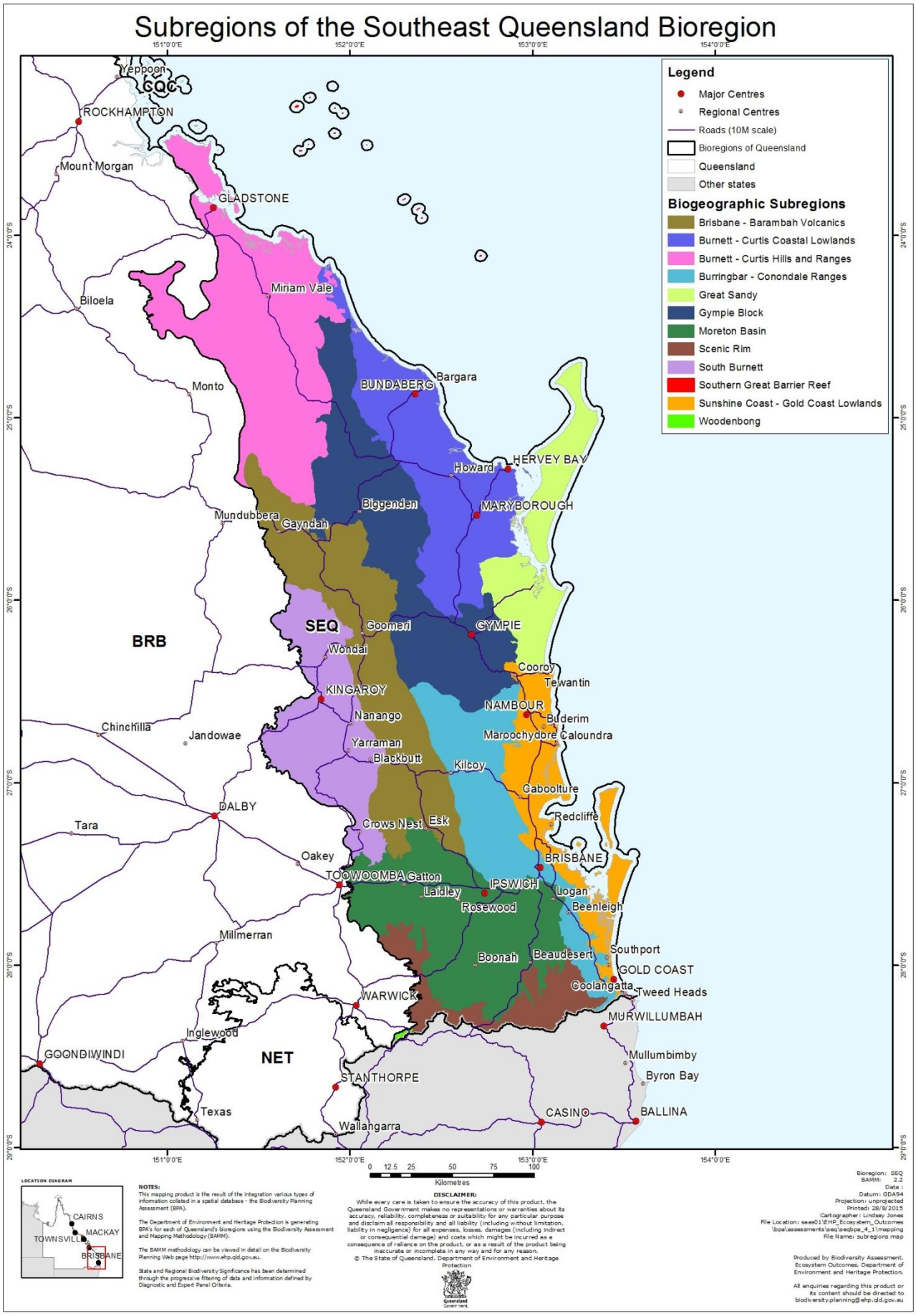


Figure 2 The Southeast Queensland Bioregion and its subregions

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
- 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 any 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 SEQ fauna expert panel comprised invited persons with knowledge of the biodiversity and/or special biodiversity values of the SEQ Bioregion and a sound understanding of ecological conservation and management principles. As far as possible, the combined expertise of participants covered the whole SEQ 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 the BAMM documentation on the EHP website. 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, EHP.

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 on 1st December 2015

Name	Organisation
Stephen Poole	Consultant
Ted Fensom	Brisbane Regional Environment Council
Don Sands	ex-CSIRO
John Stanisic	BAAM Ecology
Adrian Caneris	BAAM Ecology
Timothy Shields	Ipswich City Council
Audrey Pershouse	Moreton Bay Regional Council
Clinton Heyworth	Moreton Bay Regional Council
Peter Milne	Noosa Shire Council
Candy Daunt	Redland City Council
Dale Watson	Redland City Council
Blair Prince	Gold Coast City Council
Tina Strachan	Gold Coast City Council
Renee Domalewski	Logan City Council
Kristy Dalton	Toowoomba Regional Council
Liz Gould	SEQ Catchments
Harry Hines	NPSR Brisbane
Melanie Venz	DSITI - Queensland Herbarium
Daniel Ferguson	DSITI - Queensland Herbarium
Jesse Rowland	DSITI - Queensland Herbarium
Adrian Borsboom	DSITI - Queensland Herbarium
Peter Kind	DAF - Brisbane
Bart Mackenzie	DAF - Nambour
Ian Gynther	EHP Moggill
Support staff	
Lindsey Jones	EHP
Shane Chemello	EHP
Chamendra Hewavisenthi	EHP
Stephen Trent	EHP

2.3 Expert panel format

The fauna 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 BAMM
- available regional ecosystem mapping and 1:100 000 topographic maps
- information from databases such as Herbrecs, Corveg, WildNet, Queensland Historical Fauna Database and the Queensland Museum
- published surveys
- informal sources
- ancillary GIS layers provided for local reference included roads and cadastral information, drainage, State forests and national parks and Landsat Thematic Mapper imagery; 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)

Fauna species considered by the expert panel were EVNT species listed under the Queensland *Nature Conservation Act 1992* (NCA) or the Australian Government *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC) and priority (non-EVNT) 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, 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 known preferences of species 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 then 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.

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 SEQ bioregion records, or when species were not known to occur in the SEQ 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 the nomination of additional experts to be consulted regarding certain records or species.

2.3.1.2 Core habitat for priority taxa (criterion H)

The panel reviewed a list of priority fauna and flora species, and their associated records, with potential to be endemic and/or have disjunct distributions within the SEQ 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 SEQ bioregion.

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
- taxa of scientific interest as being relictual (ancient or primitive)
- endemic taxa
- significant species
- taxa important for maintaining genetic diversity such as complex spatial patterns of genetic variation
- disjunct species populations
- taxa functionally important to ecosystem integrity
- taxa performing a role as an ecological indicator of ecosystem integrity
- taxa vulnerable to impacts of climate change.

2.3.2 Special biodiversity values (criterion I)

The fauna panel nominated areas of special fauna biodiversity value for inclusion under criterion 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:

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

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 and standard rules for assigning significance based on combinations of values present. However, BAMM version 2.2 (Appendix 6) provides limited guidance on how expert panels are to assess criteria. The SEQ 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 Fauna taxa considerations (criteria A and H)

Criteria A and H attribute significance to areas based on the presence of EVNT taxa scheduled under the NCA or the EPBC, or presence of priority taxa. Any taxa currently listed as presumed extinct are not included in Criterion A. The SEQ bioregion fauna expert panel considered some 337 species for inclusion in criteria A and H. Table 2 summarises the categories of species. It is the general convention under the BAMM that species records are filtered to exclude fauna records older than 1975, or with a precision greater than 2000 metres. The standard BAMM record filtering rules were used.

Table 2 Summary of fauna taxa considered by the expert panel for criteria A and H

	Endangered	Vulnerable	Near Threatened	Priority (non-EVNT) taxa	Total
Number of taxa considered	37	47	7	246	337
Number of taxa for which the panel made comments	5	11	1	246	263

3.1.1 Habitat for endangered, vulnerable and near threatened fauna taxa (criteria A)

The panel reviewed records of the listed EVNT taxa and provided comments on those taxa (Table 3). The panel accepted the habitat model proposed for one EVNT species. A number of species were excluded either because there were no (or too few) reliable records of the species in the SEQ or it was considered not to be present in the bioregion.

Table 3 Comments and recommendations of expert panel relating to endangered, vulnerable and near threatened fauna taxa (criterion A)

Scientific Name	Common Name	NCA[1]	EPBC[2]	Mobility[3]	Expert Panel Comments
INVERTEBRATE					
Tenuibranchiurus glypticus	swamp crayfish	E		L	More records available from Harry Hines
Acrodipsas illidgei	Illidge's ant-blue	V		L	At risk from sea level rise
Argyreus hyperbius inconstans	Australian fritillary	E		L	
Jalmenus eubulus	pale imperial Hairstreak	V		L	
Ornithoptera richmondia	Richmond birdwing	V		L	
Phyllodes imperialis smithersi	pink underwing moth		E	L	
FISH					
Bidyanus bidyanus	silver perch		CE	L	Presence based on stocking of translocations. No natural populations
Maccullochella mariensis	Mary River cod		E	L	Includes both natural and stocked populations
Maccullochella peelii	Murray cod		V	L	Presence based on stocking of translocations. No natural populations
Nannoperca oxleyana	Oxleyan pygmy perch	V	E	L	
Neoceratodus forsteri	Australian lungfish		V	L	
Pseudomugil mellis	honey blue eye	V	V	L	
AMPHIBIAN					
Adelotus brevis	tusked frog	V		L	

Scientific Name	Common Name	NCA[1]	EPBC[2]	Mobility[3]	Expert Panel Comments
Crinia tinnula	wallum froglet	V		L	
Kyarranus kundagungan	red-and-yellow mountainfrog	V		L	
Litoria cooloolensis	Cooloola sedgefrog	NT		L	
Litoria freycineti	wallum rocketfrog	V		L	
Litoria kroombitensis	Kroombit treefrog	E		L	
Litoria olongburensis	wallum sedgefrog	V	V	L	
Litoria pearsoniana	cascade treefrog	V		L	
Litoria sp. cf *cooloolensis* (Nth Stradbroke Is pop.)	'North Stradbroke' sedgefrog	NT		L	
Mixophyes fleayi	Fleay's barred frog	E	E	L	
Mixophyes iteratus	giant barred frog	E	E	L	
Taudactylus pleione	Kroombit tinkerfrog	E	CE	L	
REPTILE					
Acanthophis antarcticus	common death adder	V		L	
Anilios silvia	striped blind snake	NT		L	
Caretta caretta	loggerhead turtle	E	E	H	
Chelonia mydas	green turtle	V	V	H	
Coeranoscincus reticulatus	three-toed snake-tooth skink		V	L	
Crocodylus porosus	estuarine crocodile	V		H	Climate change migrant

Scientific Name	Common Name	NCA[1]	EPBC[2]	Mobility[3]	Expert Panel Comments
Delma torquata	collared delma	V	V	L	
Dermochelys coriacea	leatherback turtle	E	E	L	
Elseya albagula	southern snapping turtle	E	CE	L	
Elusor macrurus	Mary River turtle	E	E	L	
Eretmochelys imbricata	hawksbill turtle	V	V	H	
Furina dunmalli	Dunmall's snake	V	V	L	
Hemiaspis damelii	grey snake	E		L	
Karma tryoni	Tryon's skink	V		L	
Lampropholis colossus	skink	NT		L	
Lepidochelys olivacea	olive ridley turtle	E	E	H	
Nangura spinosa	Nangur skink	E	CE	L	
Natator depressus	flatback turtle	V	V	H	
Phyllurus caudiannulatus	ringed thin-tailed gecko	V		L	
Phyllurus kabikabi	Gympie broad-tailed gecko	E		L	
Strophurus taenicauda	golden-tailed gecko	NT		L	Very edge of range, mostly in BRB
BIRDS					
Anthochaera phrygia	regent honeyeater	E	CE	H	
Atrichornis rufescens	rufous scrub-bird	V	E	L	

Scientific Name	Common Name	NCA[1]	EPBC[2]	Mobility[3]	Expert Panel Comments
Botaurus poiciloptilus	Australasian bittern		E	H	
Calidris canutus	red knot		E	H	
Calidris ferruginea	curlew sandpiper		CE	H	
Calidris tenuirostris	great knot		CE	H	
Calyptorhynchus lathami	glossy black-cockatoo	V		H	Entered in Wildnet can be species or subspecies taxonomy. SEQ Catchment habitat model
Charadrius leschenaultii	greater sand plover		V	H	
Charadrius mongolus	lesser sand plover		E	H	
Cyclopsitta diophthalma coxeni	Coxen's fig-parrot	E	E	H	
Dasyornis brachypterus	eastern bristlebird	E	E	L	
Epthianura crocea macgregori	yellow chat (Capricorn subsp)	E	CE	L	
Erythrotriorchis radiatus	red goshawk	E	V	H	
Esacus magnirostris	beach stone-curlew	V		L	
Falco hypoleucos	grey falcon	V		H	
Geophaps scripta scripta	squatter pigeon (southern subsp.)	V	V	L	
Grantiella picta	painted honeyeater	V	V	H	
Lathamus discolor	swift parrot	E	CE	H	
Limosa lapponica	bar-tailed godwit		V	H	Have assumed *L. l. baueri* most likely subspecies to be recorded in region

Scientific Name	Common Name	NCA[1]	EPBC[2]	Mobility[3]	Expert Panel Comments
Menura alberti	Albert's lyrebird	NT		L	
Ninox strenua	powerful owl	V		H	Home range may be 800 ha. Future panel to examine if roosting sites and not just nesting sites should be included. Need to decide what roosts to include - all or just those regularly used?
Numenius madagascariensis	eastern curlew	V	CE	H	
Pezoporus wallicus	eastern ground parrot	V		L	
Podargus ocellatus plumiferus	plumed frogmouth	V		L	May be recorded at species level rather than subspecies
Rostratula australis	Australian painted snipe	V	E	H	
Sternula nereis	fairy tern		V	H	
Stipiturus malachurus	southern emu-wren	V		L	
Thinornis rubricollis	hooded plover		V	L	Vagrant
Turnix melanogaster	black-breasted button-quail	V	V	L	
MAMMAL					
Antechinus argentus	silver-headed antechinus	V		L	Known only from Kroombit Tops and Blackdown Tableland
Antechinus arktos	black-tailed antechinus	E		L	
Chalinolobus dwyeri	large-eared pied bat	V	V	L	
Dasyurus hallucatus	northern quoll		E	L	

Scientific Name	Common Name	NCA[1]	EPBC[2]	Mobility[3]	Expert Panel Comments
Dasyurus maculatus maculatus	spotted-tailed quoll (southern subsp.)	V	E	L	See Logan and Albert Con society - Wildlife map may provide additional records & info. Very difficult to find. Statutory declarations have questionable status. Often found as roadkill at power-line infrastructure crossing points
Hipposideros semoni	Semon's leaf-nosed bat	E	E	L	Published record from Kroombit, considered to be vagrant by panel, so no core habitat in SEQ bioregion
Macroderma gigas	ghost bat	V		H	
Nyctophilus corbeni	eastern long-eared bat	V	V	L	Vagrant at western and northern edge of SEQ bioregion
Petauroides volans	greater glider		V	L	Reluctance to move from habitat despite threats. Declining, indicator taxon
Petrogale penicillata	brush-tailed rock-wallaby	V	V	L	
Phascolarctos cinereus	koala	V	V	L	
Potorous tridactylus tridactylus	long-nosed potoroo	V	V	L	
Pseudomys novaehollandiae	New Holland mouse		V	L	
Pseudomys oralis	Hastings River mouse	V	E	L	
Pteropus poliocephalus	grey-headed flying-fox		V	H	
Taphozous australis	coastal sheathtail bat	NT		L	
Xeromys myoides	water mouse	V	V	L	

1 - E = endangered, V = vulnerable, NT = near threatened as per *Nature Conservation Act 1992*

2 - CE = critically endangered, E = endangered, V = vulnerable as per the *Environmental Protection and Biodiversity Conservation Act 1999*

3 - Mobility rating H = high, L= low as per definition in EHP (2014)

3.1.2 Core habitat for priority fauna taxa (criterion H)

Priority species are non-EVNT species that are considered to be of particular conservation significance. The rationale for inclusion is based on eligibility relating to any of the following species characteristics:

1. **Taxa at risk** - Taxa that, from a bioregional perspective, are under threat and consequently have had significant population and/or range declines based on scientific evidence and/or expert opinion.
2. **Taxa of scientific interest as relictual (ancient or primitive)** - taxon (e.g. species or other lineage) that is the sole surviving representative of a formerly diverse group. Some flora and fauna taxa have been linked with important stages in the earth's evolutionary history.
3. **Endemic taxa** - Taxa which have at least 75% of their geographical range within one bioregion (Commonwealth of Australia 1995, Queensland CRA/RFA Steering Committee 1998).
4. **Significant taxa** - These species are identified by experts as important from a bioregional perspective as they exhibit characteristics such as: Taxa have limited distribution in Queensland mostly within relevant bioregion, or with a restricted range bordering two or more bioregions in Queensland (even though the species may be found outside the State within Australia and/or overseas); the species in the bioregion exhibits characteristics or traits not evident elsewhere in its range; the bioregion is a stronghold for the species or the species is considered iconic.
5. **Taxa important for maintaining genetic diversity such as complex patterns of genetic variation** - species that exhibit a recognised variation in genetic composition across the bioregion, or with respect to other bioregions. This could include taxa that appear to comprise several cryptic taxa.
6. **Disjunct species populations** - Populations broken by climatic, topographic or edaphic barriers bridged by long distance dispersal of propagules; or be seen as insurmountable barriers to dispersal requiring a geological (historical) rather than a behavioural (ecological) explanation for their presence (Groves 1981).
7. **Taxa functionally important to ecosystem integrity** - There are plant or animal taxa that play a unique and crucial role in the way an ecosystem functions, and whose decline or disappearance would see a dramatic change in the nature of that ecosystem. The contributions of such species are large compared to the species' prevalence in the habitat. They are often, but not always, a predator. A few predators can control the distribution and population of large numbers of prey species.
8. **Taxa performing a role as an ecological indicator of ecosystem integrity** - can be of many different types. They can be used to reflect a variety of aspects of ecosystems, including biological, chemical and physical integrity. Indicators are used to communicate information about ecosystems and the impact human activity has on ecosystems.
9. **Taxa vulnerable to impacts of climate change** - Species that are considered to be adversely affected by the predicted changes in climate, e.g. increasing temperatures, sea level rise and increasing frequency of extreme weather events (drought, flood & cyclones). Species can only be listed under this reason if there is sufficient knowledge of species' biology and its interaction with climate that would support an assessed impact under climate change scenarios.

The eligibility characteristics listed above differ slightly from the list used in the previous BPA version (v3.5) in the following manner:

- The definitions of each characteristic have been further refined.
- Range limits themselves are now NOT considered important enough to justify inclusion.
- A new characteristic relating to climate change has been introduced.

A total of 246 species were listed for criterion H. The number of species pertaining to each eligibility characteristic is summarised in Table 4. Most species listed had more than one reason for inclusion.

Additional species were also identified post panel by panel members and the final list of priority species 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 BAMM documentation, EHP 2014). Subsequently, all records were buffered by twice the precision (as for criteria A) with a minimum of 300m, and a maximum of 1km. The decision rules for assigning criteria H values (LOW to VERY HIGH) are summarised in Table 6.

Table 4 Criterion H taxa numbers pertaining to their rationale for listing

Eligibility characteristic	Number of Taxa
1. Taxa at risk	75
2. Taxa of scientific interest as relictual (ancient or primitive)	0
3. Endemic taxa	126
4. Significant taxa	97
5. taxa important for maintaining genetic diversity such as complex patterns of genetic variation	2
6. Disjunct species populations	19
7. Taxa functionally important to ecosystem integrity	2
8. Taxa performing a role as an ecological indicator of ecosystem integrity	4
9. Taxa vulnerable to impacts of climate change	27

Table 5 Comments and recommendations of expert panel relating to priority fauna taxa (criterion H).

Scientific Name	Common Name	BOT Rating[1]	Rationale for Listing[2]	Expert Panel Notes	Significance
WORM					
Rhizodrilus arthingtonae	freshwater worm		3, 4	Endemic, small population	State
MOLLUSC					
Austrochloritis cunninghamiana	Cunningham's Gap bristle snail		3	Endemic	State
Austrochloritis porteri	Border Ranges bristle snail		4	Restricted SEQ - NE NSW	Regional
Austrochloritis stanisici	northern rivers bristle snail		4	Restricted SEQ - NE NSW	Regional
Austrochloritis sp. - Camaenidae SQ 8	land snail - Camaenidae SQ 8		3	Endemic	State
Austropyrgus bunyaensis	snail		3	Endemic	State
Calvigenia cootha	Mount Coot-tha bristle snail		3	Endemic	State
Charopid BR 38	Stradbroke Island pinwheel snail		3	Endemic	State
Coelocion circumumbilicata	Bobby Range megaspire snail		3	Endemic	State
Coelocion craigeddiei	Lockyer Valley megaspire snail		3	Endemic	State
Coenocharopa elegans	elegant pinwheel snail		1, 3	Endemic, declining	State
Coenocharopa macromphala	sickle-bladed pinwheel snail		3	Endemic	State

Scientific Name	Common Name	BOT Rating[1]	Rationale for Listing[2]	Expert Panel Notes	Significance
Coenocharopa sordidus	dirt-covered pinwheel snail		3	Endemic	State
Cucullarion albimaculosa	white-mottled semi-slug		4	Rare	Regional
Cucullarion parkini	Parkin's semi-slug		3	Endemic	State
Cucumerunio novaehollandiae	Australian river mussel		1	Declining	Regional
Diphyoropa jonesi	Goomeri copper pinwheel snail		3	Endemic	State
Echotrida globosa	Bobby Range carnivorous snail		4	Rare	Regional
Echotrida substrangeoides	Glastonbury carnivorous snail		3	Endemic	State
Fastosarion griseola	grey blotched semi-slug		3	Endemic	State
Fastosarion papillosa	black-tasselled semi-slug		3	Endemic	State
Fastosarion staffordorum	Bunya Mountains semi-slug		3	Endemic	State
Figuladra bayensis	Biggenden banded snail		3	Endemic	State
Figuladra incei curtisiana	Port Curtis dark snail		3	Endemic	State
Figuladra reducta	Goodnight Scrub banded snail		3	Endemic	State
Fluvidona anodonta	snail		1, 3	Endemic, population decline	State
Fluvidona griffithsi	snail		3	Endemic	State
Georissa beerwah	Beerwah microturban		3	Endemic	State

Scientific Name	Common Name	BOT Rating[1]	Rationale for Listing[2]	Expert Panel Notes	Significance
Griffithsina brisbanica	Brisbane carnivorous snail		3	Endemic	State
Gyrocochlea appletoni	Appleton's pinwheel snail		3	Endemic	State
Gyrocochlea austera	dark spiral pinwheel snail		3	Endemic	State
Gyrocochlea burleigh	Burleigh pinwheel snail		3	Endemic	State
Gyrocochlea cinnamea	Bunya Mountains pinwheel snail		3	Endemic	State
Gyrocochlea goodnight	Goodnight Scrub pinwheel snail		3	Endemic	State
Gyrocochlea greenae	amber-flamed pinwheel snail		3	Endemic	State
Gyrocochlea kessneri	Kessner's pinwheel snail		4	Restricted SEQ - NE NSW	Regional
Gyrocochlea myora	Myora pinwheel snail		3	Endemic	State
Gyrocochlea paucilamellata	Canungra pinwheel snail		3	Endemic	State
Gyrocochlea raveni	Raven's pinwheel snail		3	Endemic	State
Gyrocochlea sonyacleggae	Gatton pinwheel snail		3	Endemic	State
Gyrocochlea sp. - Charopidae BR 36	land snail - Charopidae BR 36		3	Endemic	State
Gyrocochlea sp. - Charopidae BR 4	land snail - Charopidae BR 4		3	Endemic	State
Gyrocochlea vinitincta	mahogany pinwheel snail		4	Restricted SEQ - NE NSW	Regional
Hedleyella maconelli	Maconell's panda-snail		3	Endemic	State
Hildapina kenilworth	Kenilworth chrysalis-snail		3, 4	Endemic, rare	Regional

Scientific Name	Common Name	BOT Rating[1]	Rationale for Listing[2]	Expert Panel Notes	Significance
Koreelahropa paucicostata	bold-ribbed pinwheel snail		4	Rare	Regional
Leurocochlea daviei	Davie's pinwheel snail		3	Endemic	State
Luturopa kenilworth	Kenilworth waxy pinwheel snail		3	Endemic	State
Macphersonea canalis	Lamington channelled pinwheel snail		4	Restricted SEQ - NE NSW	Regional
Macularion aquila	black-spotted semi-slug		4	Restricted SEQ - NE NSW	Regional
Meridolum sp. - Camaenidae SQ 11	land snail - Camaenidae SQ 11		3	Endemic	State
Moretonistes mansueta	Moreton Bay woodland snail		3	Endemic	State
Mussonena boonah	Boonah bristle snail		33	Endemic	State
Mussonena maxima	Goodnight Scrub bristle snail		3	Endemic	State
Mussonula fallax	southern temple pinwheel snail		3	Endemic	State
Mussonula verax	northern temple pinwheel snail		4	Restricted SEQ - NE NSW	Regional
Mysticarion hyalinus	hyaline semi-slug		3	Endemic	State
Nautiliropa omicron	red-flamed pinwheel snail		4	Restricted SEQ - NE NSW	Regional
Necopupina costata	Mount Mee chrysalis-snail		3, 4	Endemic, rare	Regional
Necopupina simplex	simple chrysalis-snail		3	Endemic	State

Scientific Name	Common Name	BOT Rating[1]	Rationale for Listing[2]	Expert Panel Notes	Significance
Ngairea levicostata	brown turban pinwheel snail		3	Endemic	State
Nitor pudibunda	pink glass-snail		3	Endemic	State
Nitor subrugata	corrugated glass-snail		4	Restricted SEQ - NE NSW	Regional
Nitor wiangariensis	Wiangarie Forest glass-snail		3	Endemic	State
Papuexul bidwilli	mottled treesnail		4	Rare	Regional
Pedinogyra allani	Miriam Vale flat-coiled snail		3	Endemic	State
Pedinogyra hayii	Hay's flat-coiled snail		3	Endemic	State
Pedinogyra kroombit	Kroombit flat-coiled snail		3	Endemic	State
Pedinogyra rotabilis	southern flat-coiled snail		4	Restricted SEQ - NE NSW	Regional
Pedinogyra terrycarlessi	Bundaberg flat-coiled snail		3	Endemic	State
Pedinogyra ultra	giant flat-coiled snail		3	Endemic	State
Peloparion sp. - Helicarionidae SQ 9	land snail - Helicarionidae SQ 9		1, 3	Endemic, declining	State
Pleuropoma draytonensis	Drayton droplet snail		4	Restricted SEQ - NE NSW	Regional
Pleuropoma gladstonensis	Gladstone droplet snail		3	Endemic	State
Ponderconcha ianthostoma	Granite Belt woodland snail		4	Restricted SEQ - NE NSW	Regional
Ponderconcha morosa	Greater Brisbane woodland snail		4	Restricted SEQ - NE NSW	Regional

Scientific Name	Common Name	BOT Rating[1]	Rationale for Listing[2]	Expert Panel Notes	Significance
Pseudechotrida bordaensis	Lamington carnivorous snail		4	Restricted SEQ - NE NSW	Regional
Pseudechotrida mikros	tiny carnivorous snail		3	Endemic	State
Pseudodistes biggenden	Biggenden woodland snail		3	Endemic	State
Pseudodistes reevesi	Bunya Mountains woodland snail		3	Endemic	State
Ramogenia challengeri	Challenger's bristle snail		3	Restricted SEQ - NE NSW	Regional
Richmondaropa prava	fallen whorl pinwheel snail		4	Restricted SEQ - NE NSW	Regional
Rhophodon colmani	Colman's pinwheel snail		3	Endemic	State
Rhophodon consobrinus	Richmond River pinwheel snail		4	Restricted SEQ - NE NSW	Regional
Rhophodon elizabethae	ornate pinwheel snail		3	Endemic	State
Rhophodon minutissimus	minute pinwheel snail		3	Endemic	State
Rhophodon peregrinus	Peregrine pinwheel snail		4	Restricted SEQ - NE NSW	Regional
Rotacharopa alisonmillerae	Miller’s pinwheel snail		3	Endemic	State
Rotacharopa densilamellata	domed pinwheel snail		3	Endemic	State
Scagacola eddiei	Lockyer Valley carnivorous snail		3	Endemic	State
Setomedea nudicostata	Bulburin pinwheel snail		3	Endemic	State
Sigaloeista bordaensis	yellow silk glass-snail		4	Restricted SEQ - NE NSW	Regional
Signepupina strangei	dwarf chrysalis-snail		4	Restricted SEQ - NE NSW	Regional

Scientific Name	Common Name	BOT Rating[1]	Rationale for Listing[2]	Expert Panel Notes	Significance
Signepupina wilcoxi	Wilcox's chrysalis-snail		4	Restricted SEQ - NE NSW	Regional
Sphaerospira bencarlessi	Bobby Range banded snail		3	Endemic	State
Sphaerospira sidneyi	Maryborough dark snail		3	Endemic	State
Squamagenia separanda	Pine Rivers bristle snail		3	Endemic	State
Squamagenia yabba	Kenilworth scaly snail		3	Endemic	State
Strangesta maxima	giant carnivorous snail		3	Endemic	State
Strangesta ramsayi	Tamborine carnivorous snail		4	Restricted SEQ - NE NSW	Regional
Terrycarlessia bullacea	Bunya Mountains carnivorous snail		4	Restricted SEQ - NE NSW	Regional
Thersites richmondiana	Richmond River keeled snail		4	Restricted SEQ - NE NSW	Regional
Velepalaina strangei	Border Ranges staircase-snail		4	Restricted SEQ - NE NSW	Regional
Whiteheadia globosa	Whitehead's pinwheel snail		3	Endemic	State
Ygernaropa baehrae	Baehr's pinwheel snail		3	Endemic	State
Ygernaropa binnaburra	Binna Burra pinwheel snail		3	Endemic	State
CRUSTACEAN					
Cherax dispar	lobby		1	Declining	Regional
Cherax punctatus	land yabby		3	Endemic	State
Cherax robustus	sand yabby		1, 3	Endemic, population decline	State

Scientific Name	Common Name	BOT Rating[1]	Rationale for Listing[2]	Expert Panel Notes	Significance
Euastacus binzayedi	crayfish		3	Highly restricted endemic	State
Euastacus hystricosus	giant spiny crayfish		3, 4, 9	Endemic, small population	State
Euastacus jagara	crayfish		1, 3, 9	Endemic, population decline	State
Euastacus maidae	crayfish		1, 3, 9	Endemic, population decline	State
Euastacus monteithorum	crayfish		1, 3, 9	Endemic, declining	State
Euastacus setosus	crayfish		1, 3, 9	Endemic, population decline	State
Euastacus sulcatus	crayfish		1, 3, 9	Endemic but widespread in SEQ, population decline	Regional
Euastacus urospinosus	rainforest crayfish		3, 4, 9	Endemic, rare, small population	State
Euastacus valentulus	crayfish		4, 9	Qld range restricted to southeast corner SEQ, small population	State
Uca longidigita	grey-clawed fiddler crab		3	Endemic	State
SPIDER					
Nameria insularis	Burleigh Heads spider		1, 3	Endemic, declining	State
INSECT					
Acrodipsas arcana	black-veined ant-blue		1, 3, 9	Only on Spring Mountain threatened by too frequent fires. Consider for landscape special feature	Regional
Acanthaeschna victoria	thylacine darner		1, 3, 4	Endemic, Population decline, Small population	State
Amphistomus montanus	dung beetle		3, 9	Endemic, only at Mt Glorious	State
Amphistomus opacus	dung beetle		3, 9	Endemic	State
Amphistomus trispiculatus	dung beetle		4, 9	Restricted SEQ - NE NSW	Regional

Scientific Name	Common Name	BOT Rating[1]	Rationale for Listing[2]	Expert Panel Notes	Significance
Antipodoecia turneri	caddisfly		4	Small population	Regional
Aphroteniella filicornis	midge		1, 4	Population decline, small population	Regional
Aphroteniella tenuicornis	midge		1, 4	Population decline, small population	Regional
Archaeophya adamsi	horned urfly		1, 4, 6	Population decline, small population, disjunct population	Regional
Austremerella picta	mayfly		1, 4	Population decline, small population	Regional
Austroargiolestes chrysoides	golden flatwing		3	Endemic, restricted distribution	State
Austrolestes minjerriba	dune ringtail		1, 6	Population decline, disjunct population	State
Austrosimulium mirabile	blackfly		1, 3	Endemic, population decline	State
Barynema australicum	caddisfly		4	Small population	Regional
Cephalodesmius laticollis	dung beetle		3, 9	Endemic	State
Cosmioperla denise	stonefly		3, 4	Endemic, small population	Regional
Diorygopyx simpliciclunis	dung beetle		4	Restricted SEQ - NE NSW	Regional
Griseargiolestes albescens	dragonfly		1, 3, 4, 8	Declining, endemic, small population, indicator	State
Helicopha queenslandensis	caddisfly		3	Endemic	State
Hesperilla crypsargyra binna	silver sedge-skipper		1, 3	Split from H. hopsoni. Daves Creek - endemic. Threatened by fire	State
Hyalopsyche disjuncta	caddisfly		4	Small population	Regional
Junonia hedonia zelima	brown argus		4	Rare, small population	Regional
Lepanus glaber	dung beetle		3, 9	Endemic, only in Springbrook & Lamington	State
Lepanus storeyi	dung beetle		3, 9	Endemic, only in Springbrook & Lamington, >1000m	State

Scientific Name	Common Name	BOT Rating[1]	Rationale for Listing[2]	Expert Panel Notes	Significance
Lissapterus sp. nov.	stag beetle		1, 3	Endemic, declining	State
Mirawara purpurea	mayfly		1, 4	Population decline, small population	Regional
Neogeoscapheus barbarae	giant burrowing cockroach		1, 3	Endemic, declining	State
Onthophagus beelarong	dung beetle		6	Disjunct population in Cooloola region, other population north in Shoalwater Bay area	State
Onthophagus cooloola	dung beetle		3	Endemic	State
Onthophagus fuliginosus	dung beetle		4, 9	Northern limit at high altitude in Main Range area	Regional
Onthophagus murgon	dung beetle		1, 3	Endemic, impacted by urban development	State
Onthophagus sp. nov. CQ8	dung beetle		3	Endemic	State
Onthophagus sp. nov. SEQ2	dung beetle		4	Restricted SEQ - NE NSW	Regional
Onthophagus yarrumba	dung beetle		3	Endemic	State
Orthetrum boumiera	brownwater skimmer		3, 4	Endemic, small population	State
Orthotrichia sp. 'Caboolture'	micro-caddisfly		3, 4	Endemic, small population	State
Ovolara australis	riffle beetle		3, 4	Endemic, small population	State
Petalura litorea	coastal petaltail		1, 4, 8	Qld range restricted to SEQ, population decline, small population, indicator	State
Podonomopsis evansi	midge		1, 4	Population decline, small population	Regional
Psychopsis/Megacyopsis illidgei	lacewing		3, 4	Extremely rare; restricted to Mount Tamborine & Border Ranges	Regional
Sphaenognathus sp. nov.	stag beetle		1, 3	Endemic, declining	State
Telephlebia cyclops	northern evening darner		4, 6	Small population, disjunct population	Regional

Scientific Name	Common Name	BOT Rating[1]	Rationale for Listing[2]	Expert Panel Notes	Significance
Telephlebia godeffroyi	eastern evening darner		4	Restricted distribution	Regional
Telephlebia tryoni	coastal evening darner		3, 4	Endemic, small population	Regional
Telicota eurychlora	southern sedge darter		1, 4	Declining, small population	Regional
Tisiphone abeona morrisi	varied swordgrass brown (North Coast subsp.)		1, 4	Only 1 tiny population in QLD. Towards Gold Coast. Should be listed as threatened. Was near Tamborine. (DS). Western and northern records should not be included	State
Triplexa villa	long-horned caddisfly		4	Small population	Regional
Westriplectes angelae	long-horned caddisfly		4, 6	Small population, disjunct population	Regional
FISH					
Gadopsis marmoratus	river blackfish		1, 6	Disjunct population, declining. Widespread in southern States	State
Galaxias olidus	mountain galaxias		1, 4, 6	Disjunct population, declining. In Qld restricted to SW SEQ & eastern NET but widespread in southern States	State
Gobiomorphus coxii	Cox gudgeon		4	Restricted distribution, northern limit in SEQ	Regional
Kuhlia rupestris	jungle perch		1, 6	Disjunct population, severe population decline, range reduction, migratory	State
Macquaria novemaculeata	Australian bass		1	Population decline, migratory. Wild population in SEQ restricted to Noosa River, stocked elsewhere. Use only Noosa River records	Regional
Mugil cephalus	sea mullet		1	Population decline	Regional
Ophisternon bengalense/O. gutturale/ Ophisternon sp.	one-gilled eel/swamp eel		4, 6	Small population, disjunct population. Use all *Ophisternon* records	Regional
Porochilus sp. cf. *rendahli*	eel-tailed catfish sp.		1, 3, 4	Endemic, rare, declining	State

Scientific Name	Common Name	BOT Rating[1]	Rationale for Listing[2]	Expert Panel Notes	Significance
Rhadinocentrus ornatus	ornate rainbowfish	High	1, 4, 6	Population decline, range reduction, small population, disjunct population	State
Trachystoma petardi	pinkeye mullet		1, 4	Population decline, small population, migratory	Regional
AMPHIBIAN					
Assa darlingtoni	pouched frog		4, 5, 9	At risk from climate change; entire Qld range in SEQ wet rainforest; may comprise 2-3 cryptic taxa	State
Cyclorana alboguttata	greenstripe frog		1, 4	Population decline, small population; use only records south of Gympie	Regional
Cyclorana brevipes	superb collared frog		1, 4	Declining, small population; use only records south of Gympie	Regional
Cyclorana novaehollandiae	eastern snapping frog		1	Few recent accurate records in SEQ, possible local declines and habitat loss; use only records south of Gympie	Regional
Lechriodus fletcheri	black soled frog		4, 6, 9	Include as SEQ NE NSW endemic. Wet rainforest and adjacent communities. Relatives in New Guinea. Gold Coast CC taxon of interest	State
Limnodynastes dumerilii	grey bellied pobblebonk		4	In Qld restricted to SW SEQ & east NET - stream associated along Main Range	State
Limnodynastes salmini	salmon striped frog		1, 4	Declining particularly in southern half SEQ, restricted distribution, small population	Regional
Litoria brevipalmata	green-thighed frog		1, 4, 6	Poorly known, forest dependent, reaches northern limit in SEQ with patchy distribution due to habitat loss/fragmentation (Hines 2008). Gold Coast CC taxon of interest	State
Litoria dentata	bleating treefrog		4, 5	Two cryptic taxa; Qld range restricted to SEQ & parts eastern BRB and NET	Regional
Litoria revelata	whirring treefrog		1, 6	Disjunct population in Scenic Rim. Gold Coast CC taxon of interest	Regional

Scientific Name	Common Name	BOT Rating[1]	Rationale for Listing[2]	Expert Panel Notes	Significance
Litoria tyleri	southern laughing treefrog		4	Qld range restricted to SEQ	Regional
Pseudophryne coriacea	red-backed broodfrog		4	Entire Qld range in far south SEQ and eastern NET, locally abundant in Scenic Rim	Regional
Kyarranus loveridgei	masked mountainfrog		4, 9	Qld range wholly in upland rainforest of southern SEQ. At risk from climate change	State
REPTILE					
Amalosia jacovae	clouded gecko		3	Endemic. Southern half SEQ & disjunct population at Kroombit	State
Anilios insperatus	Fassifern blind snake		1, 3, 4	Single record at Warrill View. Endemic, specialised	State
Calyptotis temporalis	skink		6	Disjunct population	Regional
Chlamydosaurus kingii	frilled lizard		1	Declining. Greenbank population is the most southerly extent	Regional
Coggeria naufragus	satinay sand skink		3	Endemic; monotypic genus	State
Ctenotus arcanus	skink		6	Disjunct, other populations in BRB and CQC, just into NE NSW	Regional
Delma plebeia	common delma	High	1	Declining	Regional
Eroticoscincus graciloides	elf skink	High	1, 3	Endemic; limited distribution, habitat loss & fragmentation	State
Furina barnardi	yellow-naped snake		4	Poorly known taxon	Regional
Harrisoniascincus zia	skink		4, 9	Qld range restricted to Scenic Rim, SEQ with limited NSW distribution. At risk from climate change	State
Karma tryoni	Tryon's skink		3, 9	Restricted – highest parts McPherson Range & adj Tweed Range (endemic). At risk from climate change	State

Scientific Name	Common Name	BOT Rating[1]	Rationale for Listing[2]	Expert Panel Notes	Significance
Hoplocephalus bitorquatus	pale-headed snake	High	1	Declining	Regional
Lampropholis couperi	skink		3	Endemic, also at Byfield, CQC	Regional
Notechis scutatus	eastern tiger snake		1	Declining	Regional
Ophioscincus cooloolensis	skink		3	Endemic with restricted distribution	State
Ophioscincus ophioscincus	skink		3, 4	Habitat specialist. Endemic with restricted distribution	State
Ophioscincus truncatus	skink		3	Endemic with restricted distribution into NE NSW	State
Pseudechis guttatus	spotted black snake		1	Declining	Regional
Saltuarius swaini	gecko		1, 6	Disjunct population, Scenic Rim restricted species (HH). Gold Coast CC taxon of interest	Regional
Saproscincus challengeri	skink		4	Qld range limited to rainforests of Mt Tamborine-Scenic Rim, & disjunct population at Girraween (NET)	Regional
Saproscincus oriarus	heath shadeskink		6	Disjunct population – in Qld only known from North Stradbroke Island, poorly known taxon with records of few individuals from few locations (Hines et al. 2015)	State
Saproscincus spectabilis	skink		4	Upland rainforest. Associated with streams. Only known from Scenic Rim. (HH, IG)	Regional
Tiliqua rugosa	shingle-back		1	Declining	Regional
Varanus semiremex	rusty monitor	High	1, 9	Threats to mangroves Gladstone. Mangrove dieback an issue also.	Regional
BIRD					
Ardea sumatrana	great-billed heron		4	Rare	Regional

Scientific Name	Common Name	BOT Rating[1]	Rationale for Listing[2]	Expert Panel Notes	Significance
Biziura lobata	musk duck		1	Small population. Significant for Gold Coast CC taxon of interest	Regional
Cheramoeca leucosterna	white-backed swallow		1	Declining	Regional
Dromaius novaehollandiae	emu		1	Declining	Regional
Ephippiorhynchus asiaticus	black-necked stork		1, 4	Significant for Redlands based on assessments. In Carbrook wetlands and other wetlands in southern Scenic Rim. Gold Coast CC taxon of interest	Regional
Ixobrychus dubius	Australian little bittern		4	Small population	Regional
Lophoictinia isura	square-tailed kite		1	Gold Coast CC taxon of interest. Redlands CC taxon of interest	Regional
Melithreptus gularis	black-chinned honeyeater		1, 4	Rare in SEQ, possibly declining. Redlands CC taxon of interest	Regional
Pachycephala olivacea	olive whistler		1, 4, 9	Gold Coast CC taxon of interest. Threatened by climate change	State
Phaps elegans	brush bronzewing		4, 6, 9	Extensive loss of coastal heath. Core habitat in Cooloola-Fraser sand mass	State
Pomatostomus temporalis	grey crowned babbler		1	Declining in southern SEQ. through habitat destruction	Regional
Stagonopleura guttata	diamond firetail	High	1	Declining	Regional
Sternula albifrons	little tern	High	9	Nesting sites at risk from impacts of climate change - sea level rise/tidal surges in storms. Redlands CC taxon of interest	Regional
Tyto tenebricosa	sooty owl		1, 4	Redlands & Gold Coast CC taxon of interest	Regional
MAMMAL					

Scientific Name	Common Name	BOT Rating[1]	Rationale for Listing[2]	Expert Panel Notes	Significance
Antechinus subtropicus	subtropical antechinus		3	Endemic; taxonomic status of Scenic Rim populations unresolved - use records for D'Aguilar-Conondale-Blackall Ranges only	State
Cercartetus nanus	eastern pygmy-possum		1	Declining	Regional
Falsistrellus tasmaniensis	eastern false pipistrelle		1	Declining	Regional
Kerivoula papuensis	golden-tipped bat	High	4	Very wide distribution	Regional
Macropus agilis	agile wallaby		6	Disjunct population. Redlands CC taxon of interest	Regional
Macropus dorsalis	black-striped wallaby		1	Declining	Regional
Mormopterus/ Micronomus norfolkensis	east-coast freetail bat		1, 4	Suggest include. Entire Qld range in coastal SEQ - area subject to increasing pressure due to urbanisation	Regional
Ornithorhynchus anatinus	platypus		1, 4, 8	Cultural significance, indicator, population decline, small population	Regional
Petaurus australis australis	yellow-bellied glider (southern subsp.)	High	1, 8	Less prevalent in southern part of state due to logging of hollow bearing trees. Declining, indicator	Regional
Petrogale herberti	Herbert's rock-wallaby		1	Declining	Regional
Phascogale tapoatafa	brush-tailed phascogale		1	Boom and bust species. Widespread, declining?	Regional
Pseudomys patrius	eastern pebble-mouse		4	Rare, experiencing competition from introduced house mouse	Regional
Pteropus alecto	black flying-fox		7, 9	Recommend include camps, even though range is extending	Regional
Pteropus scapulatus	little red flying-fox		1, 7, 9	Declining. Recommend include camps	Regional
Rattus sordidus	canefield rat		6	Disjunct population	Regional
Scoteanax rueppellii	greater broad-nosed bat	High	1	Declining	Regional

Scientific Name	Common Name	BOT Rating[1]	Rationale for Listing[2]	Expert Panel Notes	Significance
Wallabia bicolor welsbyi	swamp wallaby (golden form)		4	Colour form largely restricted to North Stradbroke Island	Regional

1 - Back on Track rating as per NRM groups

2 - Refer to Table 4 for description of reasons

Table 6 Method for assigning values for criterion H (Priority Taxa)

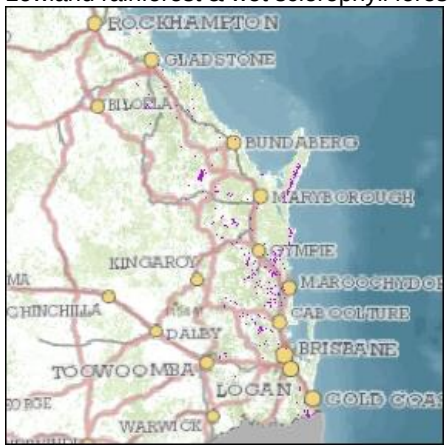
Low	Medium	High	Very High
The remnant has no confirmed records/models or otherwise defined areas of habitat for priority taxa	The area within the remnant unit has a precise record (precision =<500m), or core habitat for ONE “State significant” priority taxa OR The area within the remnant unit has precise records (precision <=500) or core habitat for only ONE or TWO “Regional significant” priority taxa OR The area within the remnant unit has imprecise records or non-core habitat for “State or Regional significant” priority taxa	The area within the remnant unit has precise records (precision =<500m), or core habitat for TWO “State significant” priority taxa OR The area within the remnant unit has precise records (precision =<500m), or core habitat for THREE “Regional significant” priority taxa OR The area within the remnant unit has precise records(precision =<500m), or core habitat for ONE “State significant” AND TWO “Regional significant” priority taxa	The area within the remnant unit has precise records (precision =<500m), or core habitat for a minimum of THREE “State significant” priority taxa OR The area within the remnant unit has precise records (precision =<500m), or core habitat for a minimum of FOUR “Regional significant” priority taxa OR The area within the remnant unit has precise records (precision =<500m), or core habitat for TWO “State significant” AND TWO OR THREE “Regional significant” priority taxa

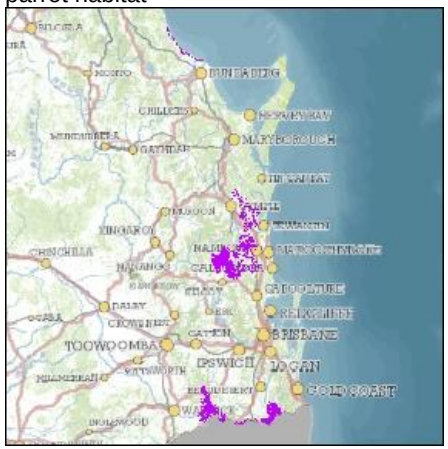
3.2 Special biodiversity values (criterion I)

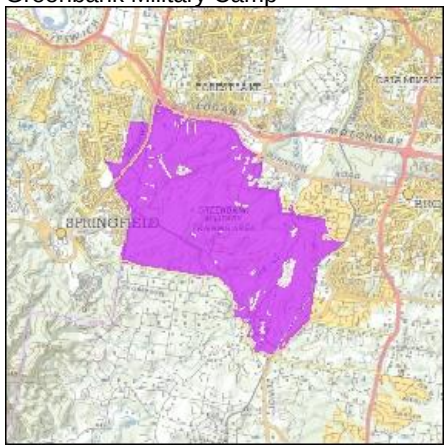
The panel was asked to identify areas with special biodiversity values within the SEQ bioregion under the BAMM supplementary criterion I. Areas with special biodiversity value are important because they contain multiple taxa in unique ecological and often highly diverse environments. Values can include 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 define 28 decisions and describe their respective values. The special areas proposed by the panel are described in Table 7. Of these, 19 were implemented, two were implemented under criterion A, three had their values captured within existing decisions, and three had their values transferred into new decisions. One decision could not be implemented at this stage due to a lack of base data.

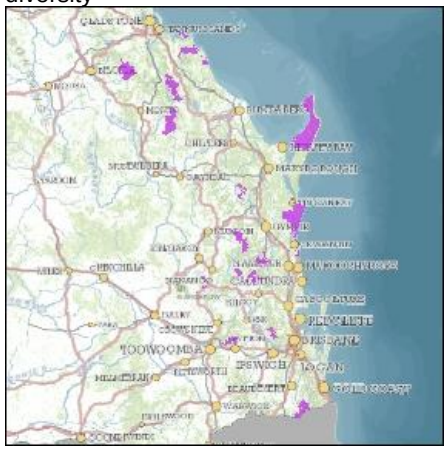
Only EVNT and priority species are specified for each decision.

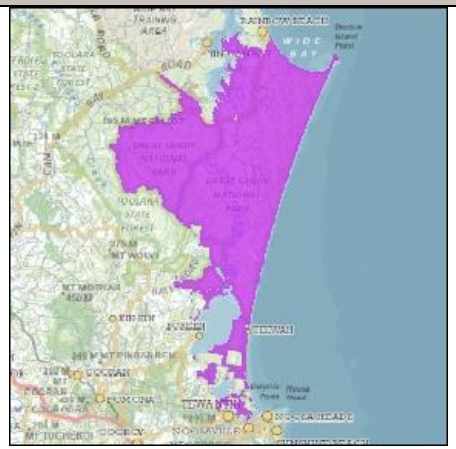
Table 7 Comments and recommendations relating to areas of special biodiversity value (criteria I)

Decision number	Description	Panel recommended significance	Identified values in BPA	Criteria values
1	Riparian/floodplain vegetation		Not implemented - lack of data on 50 year flood level. Across the entire bioregion, all riparian/floodplain remnant vegetation below the 50 year flood level be designated as being of State significance. Based on values of habitat for threatened taxa (e.g. Coxen's Fig-Parrot *Cyclopsitta diophthalma coxeni*), drought refugia for lowland fauna, corridors for altitudinal migrants (e.g. noisy pitta *Pitta versicolor*, fruit pigeon assemblage), protection of ephemeral wetlands (salmon-striped frog *Limnodynastes salmini*, Australian painted snipe *Rostratula australis*), and protection of water quality for aquatic taxa (Australian lungfish *Neoceratodus forsteri*, southern snapping turtle *Elseya albagula*, platypus *Ornithorhynchus anatinus*).	
seq_fa_02	Lowland rainforest & wet sclerophyll forest 	State	Across the entire bioregion, all rainforest and wet sclerophyll forest with a rainforest understory at elevations of < 300m asl be designated as being of State significance. Based on importance for mesic fauna (e.g. Richmond birdwing *Ornithoptera richmondia*, giant barred-frog *Mixophyes iteratus*, Fleay's barred-frog *Mixophyes fleayi*, Coxen's fig-parrot *Cyclopsitta diophthalma coxeni*), and as drought/fire refugia.	Ib (wildlife refugia): VERY HIGH

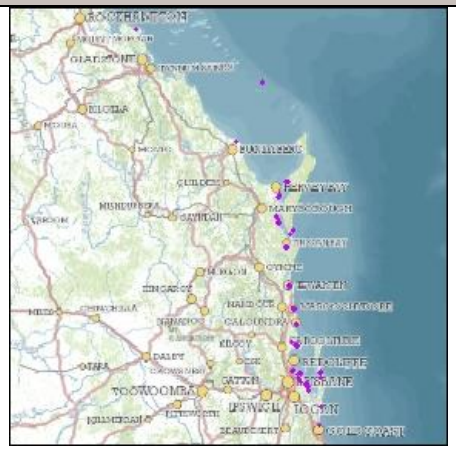
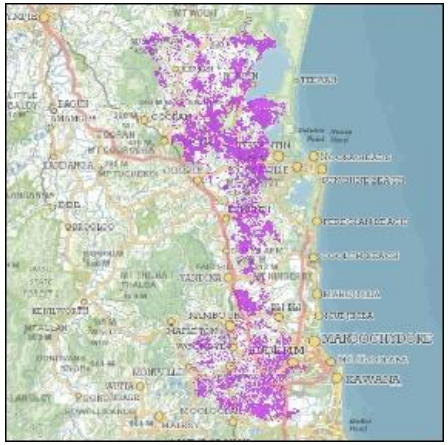
Decision number	Description	Panel recommended significance	Identified values in BPA	Criteria values
seq_fa_03	*Cyclopsitta diophthalma coxeni* - Coxen's fig-parrot habitat 	State	Important habitat areas for Coxen's fig-parrot *Cyclopsitta diophthalma coxeni* identified by expert.	Ib (habitat refugia): VERY HIGH
4	*Xeromys myoides* – water mouse habitat		Important habitat areas for water mouse identified by expert. Not implemented - replaced by habitat suitability mapping and incorporated into criterion A.	
5	*Phascolarctos cinereus* – koala habitat		Areas mapped as 'Core' or 'Other Habitats' for Koalas, as part of the Koala Coast Strategy be included as being of Regional significance for this taxon. Not implemented - replaced by habitat suitability mapping and incorporated into criterion A.	

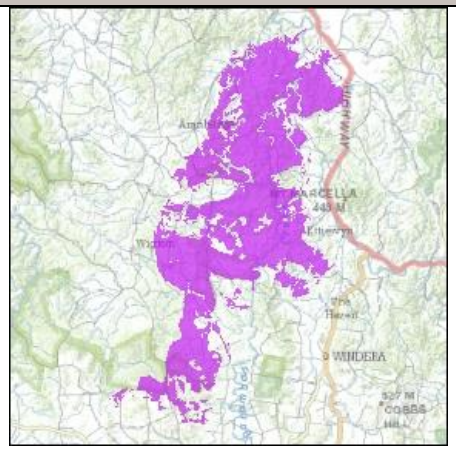
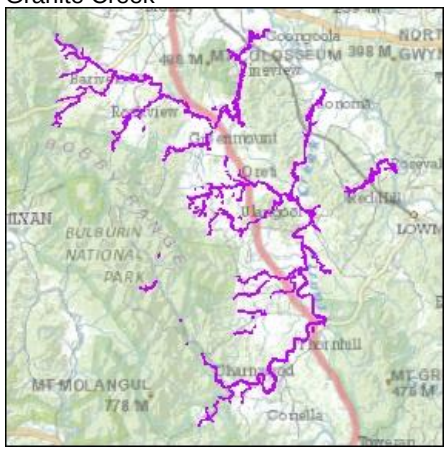
Decision number	Description	Panel recommended significance	Identified values in BPA	Criteria values
seq_fa_06	Greenbank Military Camp 	Regional	The Greenbank Military Camp is designated as being of Regional significance for the frilled lizard *Chlamydosaurus kingii*. Also potential habitat for the spotted-tailed quoll *Dasyurus maculatus maculatus*, greater glider *Petauroides volans* and squirrel glider *Petaurus norfolcensis*.	Ib (wildlife refugia): HIGH
seq_fa_07	Forested Estates with high vertebrate endemism 	Regional	Forested areas assessed as being centres of vertebrate endemism. Based on CRA analysis (McFarland 1998) and subsequent recommendations by expert panel, e.g. Noosa, Springbrook and Kroombit Tops (Kroombit tinkerfrog *Taudactylus pleione*, Kroombit Tops treefrog *Litoria kroombitensis*, silver-headed antechinus *Antechinus argentus, Euastacus monteithorum* and various other invertebrates - Hines 2014) National Parks, and Oakview NP and SF (Oakview leaf-tailed gecko *Phyllurus kabikabi*, Nangur skink *Nangura spinosa*).	Ia (SEQ endemic taxa): HIGH

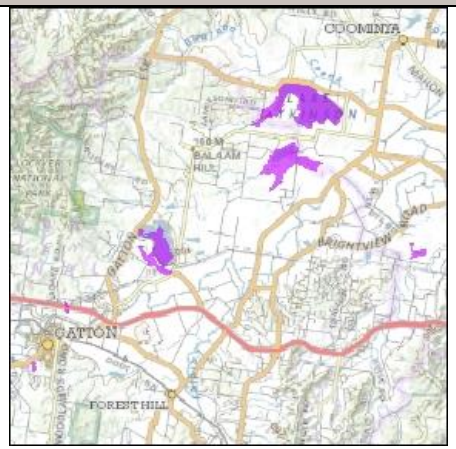
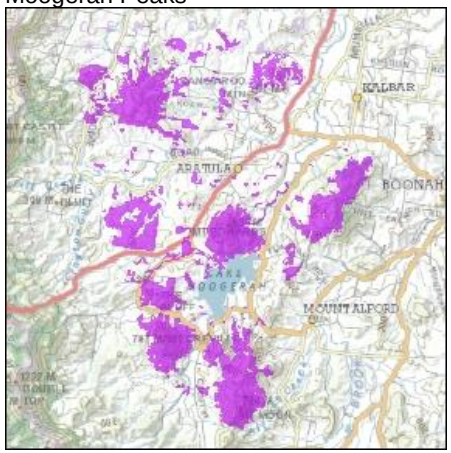
Decision number	Description	Panel recommended significance	Identified values in BPA	Criteria values
8	Sunshine Coast hinterland and Barambah Gorge tract		Implemented as two new decisions seq_fa_18 and seq_fa_19.	
seq_fa_09	Forested Estates with high vertebrate diversity 	Regional	Forested areas assessed as being centres of vertebrate diversity. Based on CRA analysis (McFarland 1998) and subsequent recommendations by expert panel, e.g. Karawatha Forest (high frog and raptor diversity), Noosa NP and parts of Eurimbula NP. Several areas, e.g. Fraser Island-Cooloola, Scenic Rim and Conondales recognised as Important Bird Areas being key sites for bird conservation (Dutson et al. 2009).	Ie (high species richness): HIGH
seq_fa_10	Cooloola and Noosa North Shore Protected Area Estate	State	The area was nomination for World Heritage Status (as part of Fraser Island WHA) – based on documented values (SAC 1999), e.g. contains protected river catchment (with threatened fish - honey blue-eye *Pseudomugil mellis*, Oxleyan pygmy perch *Nannoperca oxleyana*), examples of unique patterned fen habitat, endemic invertebrate assemblages associated with dune habitats and core habitat for 'acid' frog species (e.g. wallum froglet *Crinia tinnula*, Cooloola sedgefrog *Litoria cooloolensis*) and eastern ground parrot *Pezoporus wallicus*.	Ig (ecosystem variation): VERY HIGH

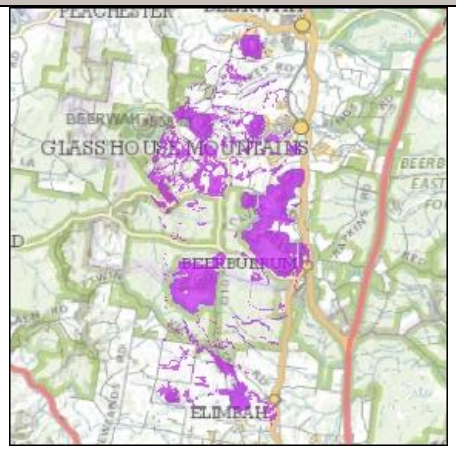
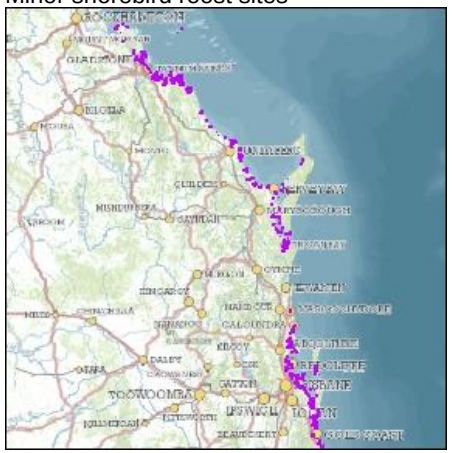
Decision number	Description	Panel recommended significance	Identified values in BPA	Criteria values
				
11	Granite Creek and Lockyer Valley		Implemented as two decisions seq_fa_20 and seq_fa_21.	
seq_fa_12	Significant sites for cave-roosting microchiropteran bats 	Regional	Significant cave roosts for microchiropterans identified as likely maternity sites, or which contain large aggregations of breeding individuals, e.g. *Miniopterus* or *Myotis* spp., or smaller roosting aggregations for selected species such as large-eared pied bat *Chalinolobus dwyeri*, eastern cave bat *Vespadelus troughtoni*, eastern horseshoe bat *Rhinolophus megaphyllus*, Troughton's sheathtail bat *Taphozous troughtoni*, and/or sites at which multiple species have been observed.	Ij (breeding / roosting sites): HIGH

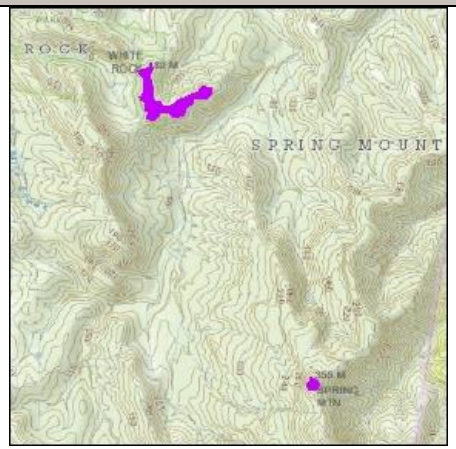
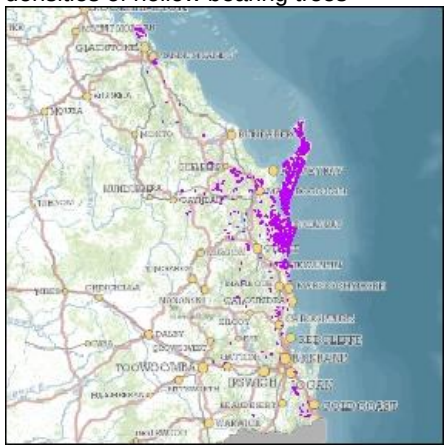
Decision number	Description	Panel recommended significance	Identified values in BPA	Criteria values
13	Various protected area estates	Regional	Not implemented. Addressed in seq_fa_03 and Landscape bioregional corridors. The areas marked as 1a-f on Figure 2 and Figure 3 are designated as being of Regional significance as east-west corridors facilitating the movement of altitudinal migrants. Corridor 1e is also significant for the presence of Coxen's fig-parrot *Cyclopsitta diophthalma coxeni*, plumed frogmouth *Podargus ocellatus plumiferus* and red goshawk *Erythrotriorchis radiatus*. Corridor 1f is also significant for the recent discovery of a new Hastings River mouse *Pseudomys oralis* population. Not implemented – captured under seq_fa_3 and in Landscape bioregional corridors.	
14	Glen Rock, Greenbank and Karawatha	State	Not implemented. Addressed in seq_fa_06, seq_fa_09 and Landscape bioregional corridors. The areas marked as 2a-e on Figure 2 and Figure 3 are designated as being of State significance as north-south corridors facilitating the movement of latitudinal migrants Compared to east-west corridors, the higher status is given since these taxa are moving between bioregions, States and, in some cases, countries, so maintaining habitat throughout their migration paths is vital. Corridor 2d includes the Glen Rock area, significant for recorded presence of red goshawk *Erythrotriorchis radiatus*, glossy black-cockatoo *Calyptorhynchus lathami*, regent honeyeater *Anthochaera phrygia* and brush-tailed rock-wallaby *Petrogale penicillata* (Lawson 2001). The major corridor 2e also links southern and northern ranges with previously identified significant remnant areas of Greenbank and Karawatha.	
15	Moogerah Peaks and Glasshouse Mountains		Split into two decisions seq_fa_22 and seq_fa_23.	
seq_fa_16	Major shorebird roosts sites	State	Major high tide roost sites for shorebirds. Over 90% of sites include five or more of the threatened shorebird taxa – eastern curlew *Numenius madagascariensis*, bar-tailed godwit *Limosa lapponica*, red knot *Calidris canutus*, curlew sandpiper *C. ferruginea*, great knot *C. tenuirostris*, greater sand plover *Charadrius leschenaultii* , lesser sand plover *C. mongolus* and/or beach stone-curlew *Esacus magnirostris*. Major roosts identified as those where the maximum number of	lj (breeding / roosting sites): VERY HIGH

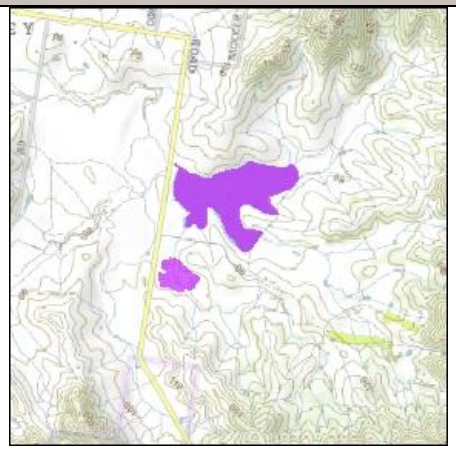
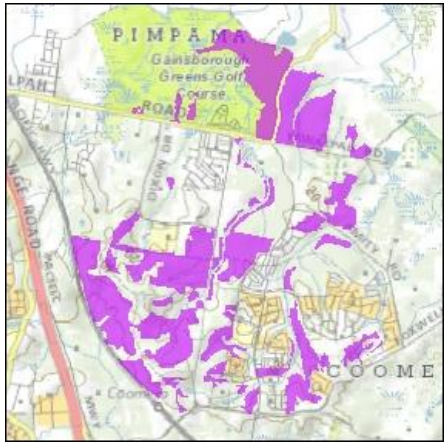
Decision number	Description	Panel recommended significance	Identified values in BPA	Criteria values
			shorebird species recorded ≥20, and the highest number of shorebirds recorded in a single survey ≥2500.	
17	Conondales and Bundaroo old growth		Not implemented - values covered in seqs_l_26.	
seq_fa_18	Sunshine Coast hinterland 	Regional	Sunshine Coast hinterland (Mooloolah to Kin Kin between coast and ranges) - over wintering refugia for summer migrants to the bioregion (e.g. fantails and monarch flycatchers) and important wintering habitat for fruit-pigeons.	Ib (wildlife refugia): HIGH
seq_fa_19	Barambah Gorge tract	Regional	Area is a large remnant in good condition (relatively undisturbed due to rugged nature and limited access)	Ib (wildlife refugia):

Decision number	Description	Panel recommended significance	Identified values in BPA	Criteria values
			providing habitat for red goshawk *Erythrotriorchis radiatus*, platypus *Ornithorhynchus anatinus* and eastern pebble-mound mouse *Pseudomys patrius*. Catchment protection for Queensland lungfish *Neoceratodus forsteri* habitat below gorge proper. Also an important nesting habitat for southern snapping turtle *Elseya albagula*.	HIGH
seq_fa_20	Granite Creek 	Regional	Importance as refugia and feeding/roosting area for mesic species such as tusked frog *Adelotus brevis*, black-breasted button-quail *Turnix melanogaster*, Coxen's fig-parrot *Cyclopsitta diophthalma coxeni*, glossy black-cockatoo *Calyptorhynchus lathami*, powerful owl *Ninox strenua*, plumed frogmouth *Podargus ocellatus plumiferus* and grey-headed flying-fox *Pteropus poliocephalus*. Note: the depicted implementation captures fringing riverine and palustrine wetland regional ecosystem and waterbody types (as per the QLD wetland mapping) within the catchment containing the Granite and Colosseum creeks.	Ib (wildlife refugia): HIGH
seq_fa_21	Lockyer Valley wetland	Regional	Includes major wetlands in the lower Lockyer Valley. Remnants of floodplain - Lake ldley, Atkinson's Dam, Lake Clarendon, 7-Mile Swamp, Jahnke's lagoon, Lake Dyer. Wetlands are large after heavy rain and include habitat for	Ib (wildlife refugia): HIGH

Decision number	Description	Panel recommended significance	Identified values in BPA	Criteria values
			water birds like the cotton pygmy-goose *Nettapus coromandelianus*, freckled duck *Stictonetta naevosa*, magpie goose *Anseranas semipalmata*, blue-billed duck *Oxyura australis* (breeding) and plumed whistling-duck *Dendrocygna eytoni*. A range of dry country frogs (15 species) are present. Other fauna includes grey snakes *Hemiaspis damelii*, blue winged kookaburras *Dacelo leachii*, certain Trichoptera (caddisflies) found only in the Lockyer Valley in SEQ. Breeding site for Australian painted snipe *Rostratula australis*.	
seq_fa_22	Moogerah Peaks 	Regional	Topographical isolates significant for hill-topping butterflies and brush-tailed rock-wallabies *Petrogale penicillata*. Also used by large-eared pied bat *Chalinolobus dwyeri,* glossy black-cockatoo *Calyptorhynchus lathami* and powerful owl *Ninox strenua*. Refugial peaks act as focal points for habitat restoration in surrounding landscape to increase connectivity between peaks as well as general naturalness of area.	Ib (wildlife refugia): HIGH Ij (breeding / roosting sites): HIGH
seq_fa_23	Glasshouse Mountains	Regional	Topographical isolates significant for hill-topping butterflies. Also used by glossy black-cockatoos *Calyptorhynchus lathami*. Refugial peaks could act as focal points for habitat restoration in surrounding landscape to increase connectivity between	Ib (wildlife refugia): HIGH Ij (breeding / roosting

Decision number	Description	Panel recommended significance	Identified values in BPA	Criteria values
			peaks as well as general naturalness of area.	sites): HIGH
seq_fa_24	Minor shorebird roost sites 	Regional	Minor high tide roost sites for shorebirds. Most sites include <5, usually 0-2, of the threatened shorebird taxa – eastern curlew *Numenius madagascariensis*, bar-tailed godwit *Limosa lapponica*, red knot *Calidris canutus*, curlew sandpiper *C. ferruginea*, great knot *C. tenuirostris*, greater sand plover *Charadrius leschenaultii* , lesser sand plover *C. mongolus* and/or beach stone-curlew *Esacus magnirostris*. Minor roosts identified as those where the maximum number of shorebird species recorded <20, and the highest number of shorebirds recorded in a single survey <2500.	Ij (breeding / roosting sites): HIGH
seq_fa_25	Areas of high invertebrate speciation – hill-tops	Regional	Summits of White Rock CP and nearby Spring Mountain. Areas used for breeding by specific butterfly species. Also noted for hilltop areas are the Glasshouse Mountains, along D'Aguilar Range and adjacent peaks as well as Moogerah	Ij (breeding / roosting sites): HIGH

Decision number	Description	Panel recommended significance	Identified values in BPA	Criteria values
			Peaks and surrounds. Rapid speciation of Lepidoptera and other arthropods. Endemics, often with limited migration between peaks.	
seq_fa_26	Lowland areas likely to contain reasonable densities of hollow bearing trees 	State	Lowland mature vegetation communities likely to support reasonable densities of hollow bearing trees. Preferential clearing of lowland areas for agriculture and urban expansion has resulted in reduced habitat complexities across remnant communities in SEQ (Eyre 2005; Treby & Castley 2015). Large contiguous areas of relatively undisturbed vegetation dominated by species such as *Lophostemon confertus, Eucalyptus microcorys, E. racemosa, E. acmenoides, E. psammitica, E. helidonica, E. carnea, E. latisinensis, E. contracta, , E. tereticornis, E. major, E. moluccana, A. leiocarpa, E. longirostrata, Corymbia intermedia* have significant wildlife refugial and nesting value due to their tendencies to form hollows.	Ib (wildlife refugia): VERY HIGH Ii (hollow bearing trees): VERY HIGH Ij (breeding / roosting sites): VERY HIGH
seq_fa_27	Daly's Lagoons	Regional	Good representative of one of a very small number of inland south-east Queensland natural lake features, containing significant wildlife value and habitat refugia provided for birds	Ib (wildlife refugia): VERY HIGH

Decision number	Description	Panel recommended significance	Identified values in BPA	Criteria values
			including migratory species.	
seq_fa_28	Remnant old growth scribbly gum forest at Gainsborough Greens, Pimpama 	Regional	Remnant scribbly gum forest including large old trees and paperbark forest in an otherwise heavily modified landscape. Wildlife refugia (Criterion Ib). High density of hollow-bearing trees (Criterion Ii).	Ib (wildlife refugia): HIGH Ii (hollow bearing trees): HIGH
Brigalow Belt BPA Version 1.3 Decisions that overlap the SEQ bioregion				

Decision number	Description	Panel recommended significance	Identified values in BPA	Criteria values
brbs_fa_58	Coominglah SF	Regional	Area designated as containing high species richness.	Ie (high species richness): y

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 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

Experts at the fauna panel raised several issues during the meeting. Broadly these centred on threats to fauna in SEQ and comments regarding various aspects of the BAMM methodology.

Over the past 200 years, SEQ has experienced a significant loss of native vegetation, particularly in the lowlands, with the conversion of inland productive land to crops and pasture and urbanisation of the coastal region (Catterall & Kingston 1993). Of immediate concern is the ongoing decline in habitat due to residential expansion both within the current urban areas and in the adjacent hinterland/peri-urban zone. In an attempt to ameliorate the impact of continuing fragmentation, fauna bridges may act as corridors linking habitat patches (Veage & Jones 2007). While animals will use constructed underpasses and overpasses (Bond & Jones 2008; Pell & Jones 2015), their effectiveness in terms of enabling the patches to sustain viable populations of the existing plant and animal biodiversity is yet to be determined.

In the near future, climate change will also threaten the region's fauna, especially those taxa confined to the altitudinal extremes. Temperature rise and erratic rainfall will see a constriction in the habitat of montane specialists such as *Euastacus monteithorum* and *Kyarranus kundagungan*. Given the SEQ topography, there is little scope for such taxa to move to higher elevations in search of refuges. In the littoral habitats (e.g. mangrove, mudflat and sandy beaches) certain taxa like waders, *Xeromys myoides* and *Acrodipsas illidgei*, are faced with diminishing habitat due to increasing sea levels and damage from more frequent storm surges. For marine turtles using SEQ for nesting there will be a decline in reproductive success with temperature increases affecting egg development and sea level change/storm impact resulting in a loss of nesting habitat and egg mortality through nest inundation. Climate change will also lead to changes in fauna composition through latitudinal shifts in species distributions. More northerly taxa are being recorded further south and there is likely to be a contraction south of those animals that reach their northern limits in SEQ.

The effect of land-use and climate change are not independent threats and when combined may have more devastating results than individually. In certain situations, mitigation efforts may buffer the negative impacts of both factors, e.g. protection of in-stream freshwater fauna through restoration of riparian habitats (Mantyka-Pringle et al. 2014). When faced with these multiple threats, conservation planning and land-use planning in general (both short and long-term) in SEQ is becoming increasingly complex.

Within the assessment methodology, the experts discussed the role of habitat models in Criterion A to better indicate the distribution of threatened taxa. Such models whether developed by EHP or other organisations, e.g. SEQ Catchments, are seen as a means of overcoming the spatial bias/limitations of the current dependence on accurate sighting records. Models created for the CATER project (Laidlaw & Butler 2012) are an important starting point but require further refinement, e.g. expert input/peer review. The panel was supportive of the models proposed, though the issue of how to integrate models for aquatic taxa (freshwater fish and turtles) into the terrestrial regionally-ecosystem based BAMM needs to be resolved.

Deliberations on the list of Priority taxa for SEQ resulted in the panel making suggestions regarding the selection criteria. A consistent theme was the need to clearly define the criteria, e.g. definition of endemic, time period over which any decline measured, how to treat cryptic taxa, role if any of range limit, significance of distribution in SEQ relative to taxon's range elsewhere in Queensland and beyond. The criteria are currently under revision. One of the outcomes of the priority list was the significant increase in the number of invertebrate taxa added. This panel was the first where a range of experts were involved to provide an insight on the other 99% of fauna biodiversity. The expansion of the list, particularly in land snails and dung beetles, does reflect the increased knowledge on the taxonomy, distribution and ecology of these groups (e.g. Stanisic et al. 2010). Often the list composition, whether invertebrate or vertebrate, is driven by dedicated individuals but the inclusion of taxa is by panel consensus. Additional invertebrate taxa were also proposed on the basis of outcomes from the fauna expert panel convened for the SEQ Aquatic Conservation Assessment. This panel also dealt with invertebrates in a far more comprehensive way than in previous assessments, where the focus has been almost totally centred on vertebrates.

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Appendix 1 Acronyms and Abbreviations

BAMM	Biodiversity Assessment and Mapping Methodology
BOT	Back on Track
BPA	Biodiversity Planning Assessment
BRB	Brigalow Belt bioregion
CC	City Council
CORVEG	The site survey database maintained by the Queensland Herbarium
CQC	Central Queensland Coast bioregion
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*
GIS	Geographic information system
HERBRECS	Specimen based register of plants held by Queensland Herbarium
NCA	*Nature Conservation Act 1992*
NE NSW	North east New South Wales
NET	New England Tableland bioregion
NPSR	Department of National Parks, 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
SEQ	Southeast Queensland bioregion
WILDNET	Department of Science, Information Technology and Innovation (DSITI)'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 SEQ 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

Remnant (RE09) RE mapping

Certified updates to remnant mapping.

Species

All fauna species records were obtained from Queensland Historical Fauna and WildNet databases. 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 SEQ bioregion BPA v3.5.

Protected areas

EPA estates

Nature refuges

Coordinated conservation areas.

Imagery

Landsat mosaic of the SEQ bioregion

SPOT imagery (10 metres).

Documents available electronically

EHP 2014, *Biodiversity Assessment and Mapping Methodology. Version 2.2*, Department of Environment and Heritage Protection, Brisbane.

Hard copy maps

SEQ bioregions and subregions (Queensland)

Statewide corridors

SEQ BPA v3.5 outputs.