

Appendix B-1: Common Conservation Significance Criteria

B1.1 Mapping of Remnant Units

Classification of areas of land according to their relative nature conservation values and significance is based on mapped units of remnant natural vegetation or wetland (“Remnant Units”), defined as:

Remnant: a continuously connected area of natural vegetation¹ with canopy exceeding 50% coverage and 70% height of the undisturbed predominant canopy.

Remnant Unit: a mapped remnant, aggregation of remnants or part of a remnant, or an area of wetland, with identifiable conservation values

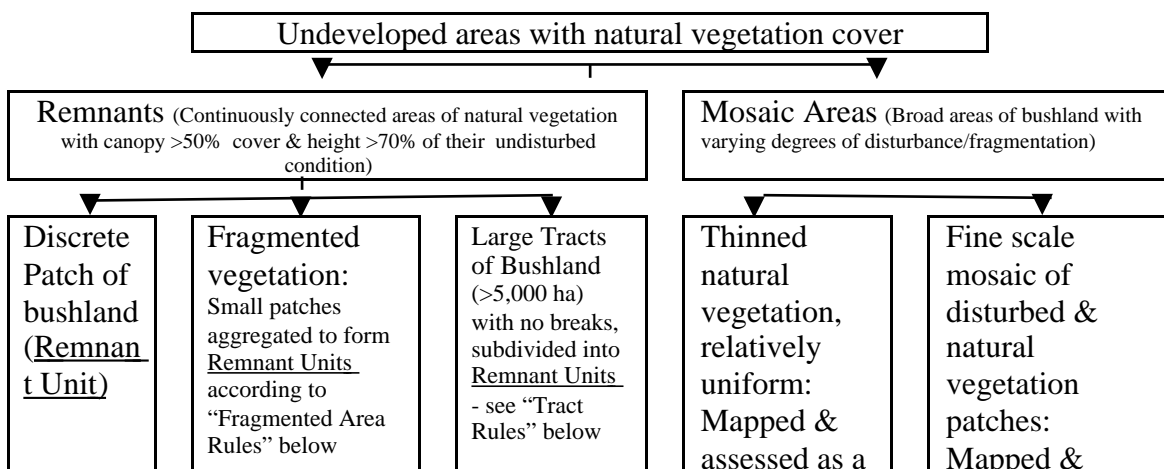
Each mapped remnant unit may be:

- β a single “remnant”, irrespective of size;
- β a subset of a large remnant; or
- β an aggregation of small remnants.

In areas of fragmented habitat, many remnant units will be self-evident as discrete patches of bushland, but wherever remnant vegetation comprises large tracts of bushland, or where patches are connected to varying degrees (eg. by narrow ‘isthmus’ bands), there is considerable margin for mapping interpretation. While the division of continuously connected areas into two or more remnant units is partly a convenience to break up unwieldy large or convoluted units, it affects the evaluation because size *per se* is one of the criteria for conservation significance

Some areas of patchy or thinned vegetation do not meet the above definition of a remnant, but have conservation values worthy of recognition and classification at local government scale. For conservation significance classification, areas of disturbed natural vegetation (e.g. thinned woodland used for grazing) may be mapped and assessed as “*Mosaic Units*”, to distinguish them from polygons of remnant vegetation mapped in accordance with Queensland Herbarium procedures.

Remnants, remnant units and mosaic units are not necessarily homogenous in composition, and may include a number of different types of vegetation (heterogeneous remnants), provided they are similar in growth form e.g. adjacent areas of woodland and open forest are normally part of a single remnant, but an adjacent mapped wetland is a separate remnant unit. Figure 1 illustrates the approach to mapping of remnant and mosaic units.



¹ “Natural vegetation” includes “vegetation” as defined in the Vegetation Management Act 1999, plus native grass and mangroves.



Figure 1 The approach to mapping of remnant and mosaic units

Nesting of Assessment Units:

The various types of mapped vegetation units described above (patches, units and tracts) are “nested” as illustrated in figure 2

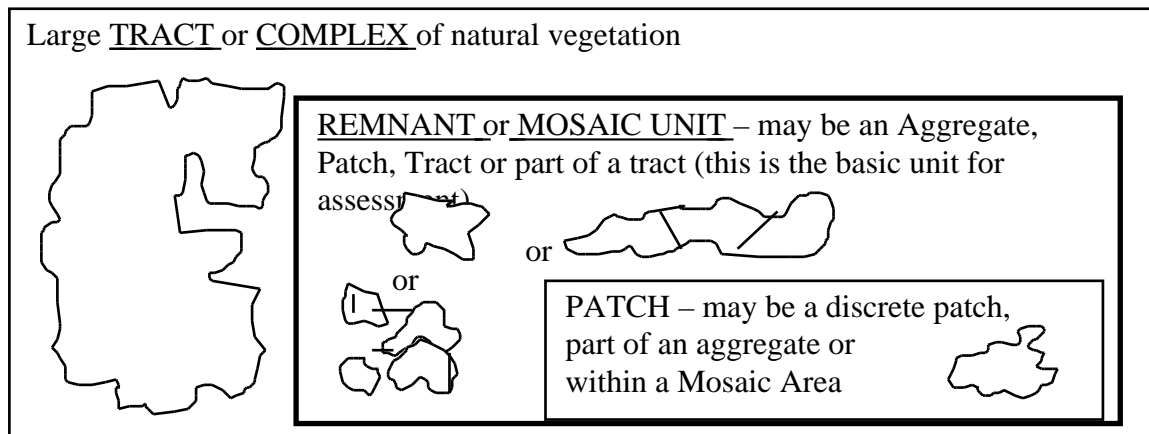


Figure 2 Nesting of assessment units

Some conservation values (e.g. those related to size) are more appropriately assessed at the largest possible aggregation (i.e. at tract or complex scale), whereas other values (e.g. those related to rarity) are more accurately assessed at the finest possible scale of resolution (figure 3). The significance of each mapped remnant unit must therefore be influenced both by the attributes of the broad tract of bushland, and those of component sub-units.

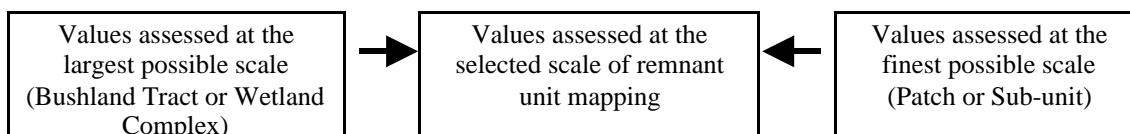


Figure 3 Values assessment

This two-way influence “buffers” the assessment process from much of the subjectivity associated with mapping the boundaries of remnant units. A decision to split or aggregate areas of bushland into one or more mapped units will not “lose” values associated with the larger or smaller units.

Mapping Rules for Dividing or Aggregating Remnants and Fragmented Areas:

The mapping of remnant units will vary according to the scale of mapping. An area of bushland which appears to form a single remnant at a coarse scale of mapping may prove to be several discrete remnants, when assessed in greater detail. Conversely areas which have been mapped at 1:100,000 as separate remnants may prove to be interconnected when assessed at 1:25,000. These discrepancies are addressed by “nesting” tracts, remnant units and sub-units so that significance is influenced by the attributes of several levels, as outlined above.

Some of the criteria for conservation significance should be applied at the finest and most accurate scale of mapping available. However assessment of remnant size should consistently recognise the importance of large bushland areas, even though these may be subdivided into smaller units at a finer scale of mapping.

The degree of connection needs to be consistently applied at each scale of mapping. A “continuously connected area” means a continuity of vegetation with no apparent breaks, as follows:

- A separation distance >50 metres should be mapped as a break between Remnant Units;
- A separation distance < 20 metres does not constitute a break in continuous connection;
- Separation distances of 20 – 50 metres may be regarded as breaks between remnant units, or as “continuously connected”, at the discretion of the mapping team and according to the degree of fragmentation encountered, provided the process is transparent and repeatable, and is consistently applied at each scale of mapping for conservation significance classification;
- Conversely, several small mapped patches of remnant vegetation in close proximity may be aggregated into a single remnant unit if the separation distance is 20 – 50 metres

However in areas of fragmented canopy cover, many remnants will have highly convoluted boundaries, and comprise patches that are tenuously connected to each other by narrow bands of vegetation (eg riparian strips) that could be considered as “continuously connected”.

Even continuously connected areas of bushland may be subdivided into separate Remnant Units if:

- The connecting band is less than 50 metres wide (unless the remnant is narrow-linear in shape eg riparian or littoral vegetation, in which case any significant narrowing may be used to divide it);
- A compact area of vegetation is connected to a narrow ‘peninsula’ or corridor;
- A large area (300 to 5,000 ha.) of vegetation has a significant narrow point corresponding to a change in ecosystem or vegetation type; or
- A large area (300 to 5,000 ha.) of vegetation is divided by a road or cleared easement or other barrier (even if the break is < 20 metres wide).

NOTE: The criteria for assessing whether areas of remnant bushland are sufficiently ‘connected’ to be regarded as a single mapped remnant unit (*intra-connection within units*) are not to be confused with those for determining connectivity between adjacent contiguous remnants (*inter-connections between units*) nor between adjacent but non-contiguous remnants. Two areas of bushland mapped as separate remnant units according to the above rules may still be classified as well-connected under the criteria for Physical Connection (6.3 Diagnostic Criterion ‘G’) and Corridor Links (6.5 Supplementary Criteria ‘K’).

Mapping Rules for large Tracts of Continuous Bushland:

Large tracts (> 5,000 ha) of natural bushland without breaks or narrow points are assessed as entire remnants for conservation values associated with size (see 6.3B “Remnant Size”). However their size and internal diversity generally confound the assessments of other criteria, and they should be subdivided into Remnant Units as follows:

- Large diverse tracts should be subdivided into Units along boundaries between Regional Ecosystems or mapped “Broad Vegetation Groups” (from Queensland Herbarium maps), at the finest scale of mapping available;
- Large but relatively homogeneous tracts (ie which cannot be subdivided using RE polygon boundaries) should be subdivided into Remnant Units by natural ecological boundaries such as a watershed or watercourse; or by topographic categories where elevation is relevant to ecological thresholds;
- It is not valid to subdivide large natural tracts by using administrative or management borders, tenure, cadastral, protected area boundaries etc..

Mapping Rules for Mosaic Areas:

Areas of thinned and grazed natural forest or woodland may be mapped as Mosaic Units and assessed for their conservation values and significance, provided:

- The degree of canopy cover over the whole mapped Mosaic Area is > 25% of its original Foliage Projective Cover (Note that vegetation with >50% of original FPC, and >70% of original height is defined as a “remnant”)
 - Disturbance is limited to tree thinning, shrub removal, fencing and grazing, with no buildings, dams, cultivation or improved pastures;
 - The species composition matches the original (pre-clearing) vegetation and ecosystems.
- NOTE:** If additional mapping rules are used to delineate Remnants or Remnant Units, the criteria must be specified so that the process is transparent and repeatable.

B1.2 Conservation Classification Criteria

The criteria for classifying mapped Remnant Units according to their relative conservation significance broadly relate to the rarity, habitat and ecosystem process values associated with remnant areas of native vegetation. Many factors contribute to nature conservation values, and the search for consistent and reliable criteria has focussed on 13 key indicators which are relatively objective and defensible. The 13 criteria are in two groups which are applied sequentially. The first group is based on existing or obtainable data which is relatively uniform and reliable across a region or sub-region. These criteria are “diagnostic” in that they are used to filter available data and provide a “first cut” or draft determination of significance. This draft assessment is then adjusted and amended using a second group of supplementary criteria. These supplementary criteria rely more upon expert opinion than on quantitative data, which in most cases is not available uniformly across the region.

1st Stage: Diagnostic Criteria (for analysis of uniformly available data) - see 6.3 below	2nd Stage: Supplementary Criteria (assessed by expert panel, using non-uniform data) – see 6.5 below
A: Essential Habitat for ‘At Risk’ Species (site-specific) B: Ecosystem Value (at three scales – A1: regional, A2: sub-regional and A3: local government) C: Remnant Size* D: Relative Size of Ecosystem E: Integrity F: Community Diversity G: Context & Connection (relationship to water, endangered ecosystems and physical connection between contiguous remnants)	H: Other Habitat for ‘At Risk’ Species I: Habitat for Other Species J: Localised Contribution to Biodiversity K: Corridor Links (between non-contiguous remnants) L: Geomorphological Variation M: Other Ecosystem Values
* = Absolute size is assessed at the largest aggregated remnant size ie. bushland tracts or wetland complexes.	

The above relate to the three broad ‘themes’ of nature conservation values as follows:

- β **Rarity Values:** A & H (Endangered Species Habitat); B (Ecosystem Conservation/Threat Status); and D (Relative Size):
- β **General Habitat Values:** C (Absolute Size); E (Integrity); F (Diversity); I (Species); J (Local Biodiversity Contribution) and L (Variation);
- β **Ecosystem Process Values:** G & K (Context and Linkages) and M (Other Values).

B1.3 Diagnostic Criteria

The following seven diagnostic criteria use reliable and uniformly available information which is usually accessible in database format, and which can be queried to automatically generate significance classes, using consistent rules of combination (see 6.4 below). A ‘filtering’ process has been designed to assess remnant units by these criteria in order, from A to G (see Tables 6.4a and 6.4b). The criteria have been designed for consistent assessment, whether the required investigations are undertaken at a basic, intermediate or advanced level; according to the resources available for investigation and mapping.

A: Essential Habitat for 'At Risk' Species

Definition & Rationale: Critical habitat and known habitat locations for breeding populations of Endangered, Vulnerable and Rare (EVR) species of flora and fauna, where they can be definitely associated with remnant units, are of very high nature conservation significance for the maintenance of biological diversity. EVR species are those scheduled under the *Nature Conservation (Wildlife) Regulation 1994*. The term 'species' includes inadequately-described taxa.

Note: This criterion excludes EVR fauna with home ranges, territories or movement patterns that extend beyond the remnant unit where they have been recorded. These wide-ranging species are considered in Supplementary Criterion H below.

(i) **Basic** - Herbarium, Queensland Museum and EPA records of plants, fauna which are restricted to particular locations, and known breeding sites of EVR species.

(ii) **Intermediate/Advanced** - As for A (i) Basic, as confirmed by survey

Rating:	Low	Medium	High	Very High
<i>Indicator</i>	The remnant unit is not known to support any EVR species	The remnant unit is known to support 1 Vulnerable or Rare species	The remnant unit is known to support 2 Vulnerable or Rare spp. - 3	The remnant unit is known to support 1 or more Endangered sp. OR > 3 Vulnerable or Rare spp.

B: Ecosystem Value

Definition & Rationale: The current level of conservation concern (at bioregional, sub-regional or local scale) associated with each identifiable ecosystem or wetland represented in the remnant unit.

Note: The scale of application of this criterion is progressive ie. A1 should be assessed first, followed by A2 then A3 if applicable. It should be applied at the finest scale of mapping available. For heterogeneous remnant units, the highest rating applies ie if one of the component REs is 'Endangered', then the entire mapped remnant unit is assessed as 'Very High'.

B1: Regional Ecosystem Value

(iii) **Basic** - Bioregional conservation status of each Regional Ecosystem (RE) as mapped at 1:100,000 (from 'The Conservation Status of Queensland's Bioregional Ecosystems', Sattler & Williams 1999 and REMAT CD) OR nationally important wetlands (from 'A Directory of Important Wetlands in Australia', or Regional Coastal Management Plans) OR other special ecosystems[#].

(iv) **Intermediate/Advanced** - As for A1 (i) Basic, as confirmed by ground truthing and/or more accurate mapping to check that the vegetation and other ecosystem attributes match the RE and/or wetland descriptions; and/or to divide heterogeneous polygons.

Rating:	Low	Medium	High	Very High
Indicator	No Concern RE* (> 50% of the original extent remains in the region) OR Not Mapped (eg Mosaic Units)	No Concern RE* (30 – 50% of the original extent remains) OR any other intertidal wetland vegetation***	‘Of Concern’ OR ‘Poorly Conserved’ RE* OR Nationally Important Wetland** listed on 1 – 3 criteria OR Coastal Wetland of ‘Regional’/ ‘Major Habitat’ Significance **	‘Endangered’ RE* OR Nationally Important Wetland listed on >3 criteria OR Ramsar-listed wetland OR World Heritage Area

*, ** & *** - see below under A3

B2: Sub-Regional Ecosystem Value

- (i) **Basic** - Sub-regional conservation status of 1:100,000 mapped Regional Ecosystems, as determined for the particular Province as part of the Regional Nature Conservation Strategy (RNCS) for South East Queensland; and important wetlands (from A Directory of Important Wetlands in Australia or as identified in Regional Coastal Management Plans).
- (ii) **Intermediate** - As for A2 (i) plus additional ground truthing and/or more accurate mapping to check that vegetation and other ecosystem attributes match the RE and wetland descriptions; and/or to divide heterogeneous polygons.
- (iii) **Advanced** - As for A2 (i) and (ii) but based on full mapping at a scale of 1:50,000 or 1:25,000 of vegetation types, land systems, wetlands or community / habitat types.

Rating:	Low	Medium	High	Very High
Indicator:	Of Limited Conservation Value RE* within the Province OR Not Mapped (eg Mosaic Units)	Moderate Conservation Value RE* within the Province OR any other intertidal wetland vegetation**	High Conservation Value RE* (and only 10-30% of the pre-clearing extent remains in the Province) OR ‘Poorly Conserved’ RE* OR ‘Valuable Habitat’ Coastal Wetland** OR	High Conservation Value RE* (and < 300 ha, <u>or</u> < 10%, of pre-clearing extent, remains in the Province) OR Nationally Important Wetland** listed on 1 – 3 criteria OR Coastal Wetland of ‘Regional’/ ‘Major Habitat’ Significance **

			other Special Ecosystems [#] .	
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*, **,*** & [#] - see below under A3

B3: Local Government Ecosystem Value

- (i) **Basic - Not applicable** (ie the minimum level of evaluation is Level (ii) for local government scale assessments).
- (ii) **Intermediate** – Conservation values (within each local government area) of identifiable ecosystems (or vegetation/soil type/topography combination) and important wetlands (from Regional Coastal Management Plans or *Conservation Assessment of Coastal Wetlands in Southeast Queensland*); as mapped at 1:50,000 and cross-referenced to Regional Ecosystems, with ground truthing to check that the vegetation and other ecosystem attributes match descriptions (but recognising that additional ecosystems may be identified at this scale).
- (iii) **Advanced** - As for A3 (ii) Intermediate but based on detailed survey and mapping at 1:25,000, cross-referenced to Regional Ecosystems; but recognising that additional ecosystems may be identified at this scale.

Rating:	Low	Medium	High	Very High
<i>Indicator:</i>	Of Limited Local Conservation Value RE* within the Local Government area OR Not Mapped (eg Mosaic Units)	Moderate Local Conservation Value RE* within the Local Government area OR any other intertidal wetland vegetation** *	High Local Conservation Value RE* (and only 10-30% of the pre-clearing extent remains in the Local Government area) OR 'Poorly Conserved in Province' RE* OR "Local Significance" Wetlands**	High Local Conservation Value RE* (and < 300 ha, <u>or</u> < 10% of pre-clearing extent, remains in the Local Government area) OR "Valuable Habitat" Wetlands** OR other Special Ecosystems [#] .

Notes to accompany ratings tables for A1, A2 & A3:

* Regional Ecosystems (REs) that are '**Endangered**', '**Of Concern**', '**Of No Concern at Present**' and '**Poorly Conserved**' are defined in Sattler & Williams 1999, and identify conservation status at bioregional scale only. The categories '**High Conservation Value**', '**Moderate Conservation Value**' and '**Limited Conservation Value**' and '**Poorly Conserved in Province**' are equivalent terms applicable at subregional and local government scales, using similar threshold criteria (eg 'Poorly Conserved' REs have <10% in Conservation Reserves in the bioregion (A2) or province (A3)). The Regional Nature Conservation Strategy may also apply other criteria for sub-regional conservation values, taking into account other values.

** "Valuable Habitat" and "Local Significance" wetlands as identified *Conservation Assessment of Coastal Wetlands in Southeast Queensland* (Chenoweth EPLA 1999, for Environmental Protection Agency)

*** Intertidal wetland vegetation is protected under the Fisheries Act.

Special Ecosystems are those of high species richness, geographically restricted distribution or with specialised ecosystem functionality (irrespective of whether they are also Endangered or Of Concern) as nominated in the Regional Nature Conservation Strategy.

C: Remnant Size

Definition & Rationale: The area in hectares of each mapped Remnant Unit. The size of any area of natural vegetation is a major indicator of ecological significance, diversity, and is also strongly correlated with viability. Larger remnants are less susceptible to ecological edge effects, and as a consequence are more likely to be able to sustain viable populations of native flora and fauna.

Notes: Uniform size thresholds apply at regional, subregional and local government scales. Where a large tract (>5,000 ha) of continuous bushland has been divided into two or more mapping units by a watershed, waterway, ecosystem or vegetation boundary (in accordance with 6.1), the size of the combined large tract is used to evaluate each unit.

Basic/Intermediate/Advanced (one feasibility level only) - Size (ha) of entire remnant as mapped at 1:100 000.

Rating:	Low (ha)	Medium (ha)	High (ha)	Very High (ha)
<i>Indicator</i>	0-20 (and Mosaic Units)	21-300	301 – 5,000	>5,000

D: Relative Size of Ecosystem

Definition & Rationale: The area of each mapped Remnant Unit, expressed as a percentile category relative to other similar remnants. Some plant communities commonly cover large areas, while others are normally restricted to small patches. A measure of the area of each remnant, relative to other remnants of similar vegetation, indicates whether this patch of vegetation is likely to be a 'good' representative sample of its type, and whether it is likely to represent a significant proportion of its type remaining in the area. A remnant which includes a relatively high proportion of the remaining ecosystem has high conservation significance.

Notes: This criterion should be applied at the finest scale of mapping available.

Size thresholds vary according to scale of application (regional, subregional and local government).

For heterogeneous remnant units, the areas of each component RE are based on the percentage of equivalent vegetation map unit within mapped polygons.

(i): Basic - Size (ha) of remnant unit in relation to other remnant units in the region / sub-region / local government area, derived from GIS analysis of vegetation mapping at 1:100,000 for each sub-region and/or local government area; with size classes representing four equal percentile groups of the size distribution (equal numbers of each polygon in each percentile).

(ii): Intermediate/Advanced - Size (ha) of remnant unit (or RE or vegetation map unit within each remnant unit) in relation to other remnants of this ecosystem / vegetation type in the region / sub-region, derived from GIS analysis of vegetation mapping at 1:25,000 or 1:50,000

for each sub-region and/or local government area; with size classes representing four equal percentile groups of the size distribution (equal numbers of each polygon in each percentile).

D1: Regional Relative Ecosystem Size

D2: Sub-regional Relative Ecosystem Size

D3: Local Government Relative Ecosystem Size

Rating:	Low (ha)	Medium (ha)	High (ha)	Very High (ha)
<i>Indicator:</i>	In the smallest 25%	In the second quarter percentile of size	In the third quarter percentile of size	In the largest 25%

For example, for the South east Queensland bioregion:

Rating:	Broad Vegetation Group (Qld Herbarium mapping)	Low (ha)	Medium (ha)	High (ha)	Very High (ha)
DRAFT	TBA	TBA	TBA	TBA	TBA

* **Source:** Queensland Herbarium

E: Integrity

Definition & Rationale – The extent to which each remnant patch resembles its pre-clearing condition, as indicated by canopy integrity, degree of disturbance, regrowth etc. Integrity is one of the indicators of ecosystem “quality” in each remnant.

E (i): Basic - Landcover canopy fragmentation (integral/thinned/mosaic bushland), from Catterall & Kingston 1991 mapping; checked against State-wide Land and Tree Survey (SLATS) data from DNR.

Rating:	Low	Medium	High	Very High
<i>Indicator:</i>	Bushland / Clearance Mosaic <u>OR</u> unclassified vegetation	Integral / Thinned Bushland Mosaic	Thinned Bushland	Integral Bushland

E (ii): Intermediate - Ecological Maturity Classes and Disturbance Index Group Classes as mapped by Department of Natural Resources; OR age and completeness of canopy cover as assessed by air photo interpretation (including historical air photos) and Forestry records, and mapped at 1:50,000 or 1:25,000 in the categories following D(iii):

E (iii): Advanced - As for D (ii) Intermediate, based on field survey and mapping at 1:25 000 in the following categories:

Rating:	Low	Medium	High	Very High
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<i>Indicator:</i>	EMC 4 & DIG 4 or 5* <u>OR</u> Grossly disturbed community as assessed by DNR criteria**	EMC 3 or 4 & DIG 3 or 4* <u>OR</u> Young / moderately disturbed community as assessed by DNR criteria**	EMC 1 or 2 & DIG 1 or 2* <u>OR</u> Well-developed and lightly disturbed community as assessed by DNR criteria**	EMC 1 & DIG 1* <u>OR</u> Old Growth forest ** (ecologically mature forest where the effects of disturbance are negligible)
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* EMC = Ecological Maturity Class & DIG = Disturbance Index Group, as defined by DNR Forest Ecosystem & Assessment Unit for assessing 'Old Growth' forests. Mapping and digital data is available for eucalypt forests only, and some areas have been mapped for DIG only.

** Old Growth forest as defined in "Sustainable Forest Management Technical Report: Old Growth Forest in South-east Queensland" (DNR 1998), taking into account the particular forest type, its maturity and disturbance criteria (mainly fire, logging and grazing).

F: Community Diversity

Definition & Rationale: - The number of different ecosystems present in an area is a broad indication of its habitat diversity and ecotones (boundaries). The diversity of REs within heterogeneous polygons, and in groups of adjacent homogeneous polygons, is best expressed on an area density basis eg the number of REs per 1km² grid cell or circle. Where detailed vegetation mapping indicates that additional habitats are present (eg. riparian or littoral strips, pasture grass and other non mapped vegetation), these should be counted as extra ecosystems.

F (i): Basic - Number of ecosystems within each 1 km² grid cell or circle, as identified by mapped REs OR the number of wetland classes recorded for important wetlands (from A Directory of Important Wetlands in Australia). Distinguishable riparian and littoral vegetation and non-native vegetation may be counted as additional ecosystems or wetland classes.

F (ii): Intermediate – As for E (i) Basic, plus air photo interpretation and ground truthing to check vegetation and other ecosystem attributes.

F (iii): Advanced – As for E (i) and (ii), based on field surveys and mapping at 1:25,000.

<i>Rating:</i>	Low	Medium	High	Very High
<i>Indicator</i>	1-2 ecosystems or wetland class / km ²	3 ecosystems or wetland classes / km ²	4 ecosystems or wetland classes / km ²	> 4 ecosystems or wetland classes / km ²

G: Context & Connection

Definition & Rationale: The extent to which the remnant unit incorporates, borders or buffers other areas of conservation significance, other remnant units, or important ecological processes; as follows:

(i) Water: The presence / inclusion of, or other relationship to, a waterbody, watercourse or marine / estuarine system increases the significance of remnant bushland for contributing to ecological processes; and to protecting that water body.

(ii) Endangered Ecosystem: Remnant units bordering Endangered REs have additional importance as buffers and habitat extension.

(iii) Physical Connection: The degree to which remnant units are connected to other contiguous areas of vegetation. Patches of bushland which are connected to others contribute more to a habitat network than isolated fragments with significant barriers to wildlife movement, and therefore are considered significant for the long term survival of plants and animals.

NOTE: Where a continuous area of bushland has been divided into separate remnants according to the mapping rules in 6.1, this criterion balances the assessment by taking the connection into account. Within tracts of bushland, almost all remnant units (apart from some on the edge) will have “Very High” connections.

F: Basic/Intermediate/Advanced (*one feasibility level only*) – Presence/absence of any association to natural waterbodies and/or streams (2nd Order and above); proximity to a remnant unit with an Endangered RE; and/or extent of physical linkage to other remnant units, as mapped at any scale (by RE or vegetation map unit, provided it is consistent). Assessment may be by air photo interpretation or overlay of reliable hydrological and vegetation maps.

Rating:	Low	Medium	High	Very High
Indicator	No permanent or seasonal waterbodies or watercourses apart from gullies OR Not physically connected to other remnant units**	The mapped remnant unit includes one or more seasonal watercourse or wetland; OR Connected along a common boundary of < 500 metres <u>OR</u> < 10% of total remnant perimeter length to another remnant unit OR Connected to a remnant unit with an Endangered RE along a common boundary of < 10 % of that unit’s perimeter	The mapped remnant unit borders# one or more natural waterway* or wetland OR Connected along a common boundary of 101-500 metres <u>AND</u> 5 - 10% of total remnant perimeter length to another remnant unit OR Connected to a remnant unit with an Endangered RE along a common boundary of 10 - 25% of that unit’s perimeter	The mapped remnant includes one or more natural waterways* or wetlands OR Connected along a common boundary of > 500 metres <u>OR</u> >10% of total remnant perimeter length to 2 or more other remnant units OR Connected to a remnant unit with an Endangered RE along a common boundary of >25% of that unit’s perimeter

* Note: Waterways are streams of 2nd Order and above, or other permanent streams and bodies of water. Where a waterway divides an area of otherwise continuous bushland into two mapped remnants (in accordance with 6.1), each should be assessed as if they include the waterway.

** Gaps of varying widths between adjacent remnants are assessed as “Corridors” under Supplementary Criterion “K”.

At Local Government scale, riparian buffers (outside mapped polygons of existing native vegetation) are also rated as “High” as follows:

Stream Order	Width of buffer classified as ‘High’ Conservation Value
1 st Order Streams	20 metres either side
2 nd Order Streams	40 metres either side
3 rd Order Streams	80 metres either side

B1.4 FILTERING COMBINATIONS

In order to combine the above seven diagnostic criteria and determine a ‘first cut’ analysis of relative conservation significance, a series of sequential data queries is required. These queries have been designed to ‘interrogate’ a GIS database and efficiently filter large volumes of data for an entire region, but can also be used as a series of questions applied to a particular site. The process progressively filters out remnants that are clearly of high significance in the bioregion¹, then applies similar filters to identify remnants of significance at sub-regional and local government scale; as indicated in the Flow Diagram (Figure 4).

While the criteria are not specifically ‘weighted’, the query order and the rules of combination (see Table 1) effectively accord priority to Criteria A (Essential Habitat of ‘At Risk’ Species), B (Ecosystem Values), C and D (Absolute Size of Remnant, and Relative Size of Ecosystem).

The importance of remnant size is also reinforced in Criteria F (Community Diversity) and G (Context & Connections) because large areas of bushland are more likely to include more than one ecosystem, more likely to include or abut an endangered ecosystem, and more likely to include creeks and waterholes.

The rules of combination establish ‘triggers’ for identification of significant areas, and place greater emphasis on Criteria A, B, C and D by the use of “AND / OR / Not Relevant” combinations, as follows:

- β Remnant Units with essential habitat for two or more species scheduled as Endangered under the *Nature Conservation (Wildlife) Regulation 1994* (Criterion A = Very High); and Regional Ecosystems that are ‘Endangered’ (Criterion B1 = Very High); will always be assessed as having regional conservation significance irrespective of their size, condition, connectivity etc (ie. all other criteria are Not Relevant);
- Remnant Units with essential habitat for species scheduled as Vulnerable or Rare (Criterion A = High); and Ecosystems that are ‘Of Concern’ (B1 = High) will be assessed as having regional conservation significance if they are a relatively very large area of that ecosystem (D = Very High) or a relatively large or integral area of that ecosystem (D = High, E = High or Very High) within a large remnant or tract of bushland (C = High or Very High);

¹ State Nature Conservation Significance is defined as: *Places, features, ecosystems and populations of species (and other taxa) which represent or contain the remaining natural and biological diversity of a bioregion, and the habitats and ecological processes on which viable populations depend, assessed as being of national or State significance by accepted scientific criteria.*

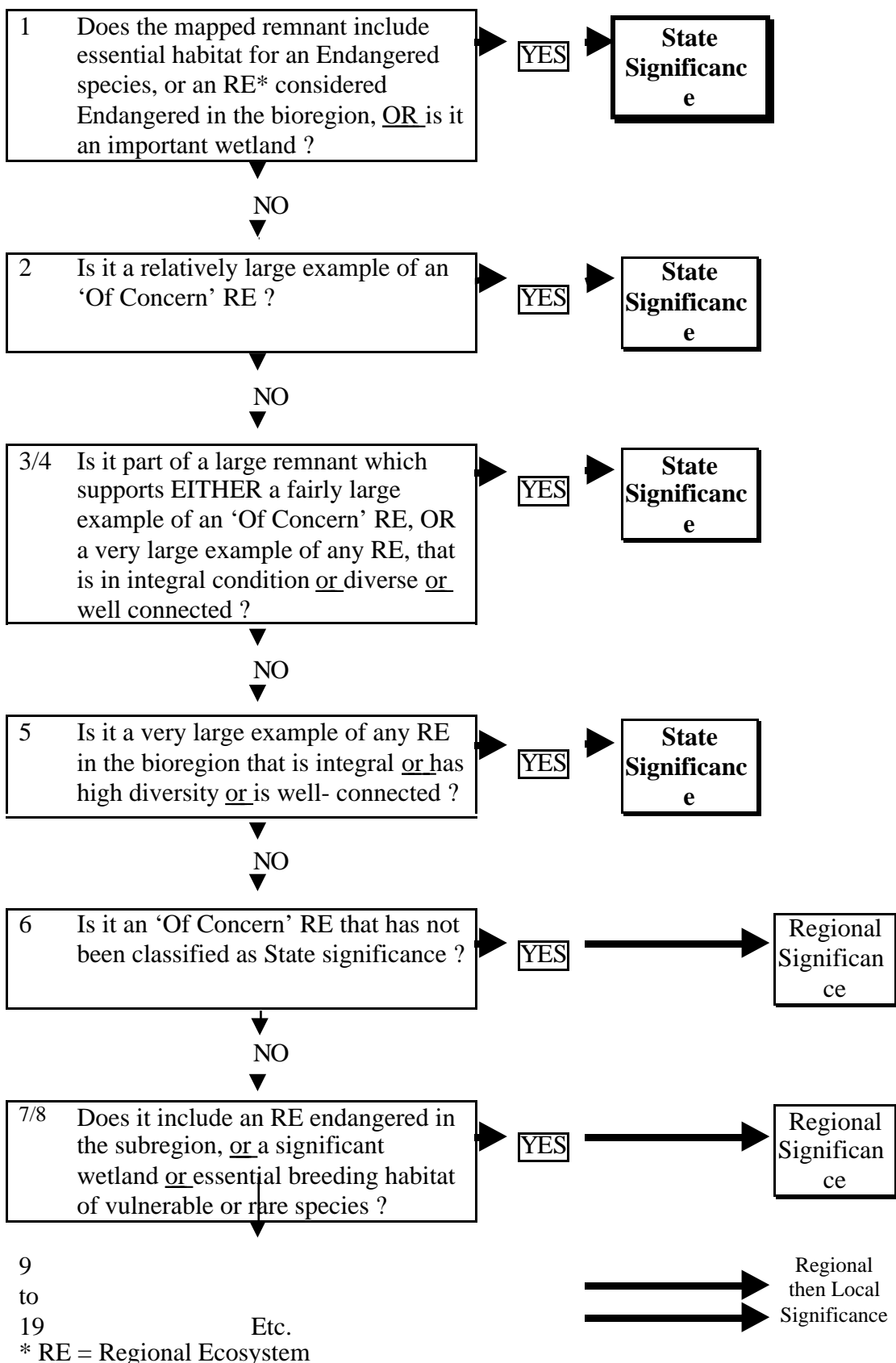
- Within large tracts of bushland (C = Very High), other remnant units may also be regionally significant if they are High integrity (D = High or Very High) or a relatively large area of an ecosystem (C = High or Very High) ; and
- Other ‘triggers’ of significance require combinations of High/Very High ratings for integrity (E), community diversity (F), or context and connections (G).

Differences in relative emphasis can also be inferred from the ratings which trigger significance ie. a criterion which triggers regional significance at either a “Very High” or “High” rating has greater influence than a trigger that operates only at “Very High” rating.

Table 1 details the series of 19 data queries for the ‘first cut’ diagnostic criteria, which are conducted in order (1 to 19) to progressively filter out those remnants of high conservation significance, then proceeding to the next query of those remnants which did not ‘trigger’ significance at the previous level.

The end-product of the data queries is a draft (‘1st Cut’) classification of mapped remnant units, which is then subject to review and modification by an expert panel, using the additional ‘Supplementary Criteria’ as detailed in 6.5.

Figure 4 FLOW DIAGRAM for FILTERING DATA to identify CONSERVATION SIGNIFICANCE



NOTE 1: The above ‘filters’ allow the key criteria of absolute size and relative rarity (ecosystem values and proportion of total ecosystem remaining) to dominate the “1st Cut” of conservation significance. Only those remnants assessed as Very High for rarity or size, or High for both rarity and size, are filtered out as significant at regional, subregional or local

scale. The other criteria of ecosystem processes (integrity, diversity, relationship to water and physical connections) support but do not dominate the selection.

B1.5 SUPPLEMENTARY CRITERIA

An expert panel should be convened to review the “1st cut” results of data queries based on the Diagnostic Criteria, using the following criteria to amend the conservation significance of each remnant unit. The panel should include people familiar with both the flora and fauna of the region and local government area, and must undertake the assessment in a structured, consistent and transparent manner.

The expert panel should review the draft maps for inconsistencies and anomalies, and especially the areas between each polygon. Some areas mapped by Queensland Herbarium as cleared may support vegetation which meets the definition of ‘remnant’ or ‘mosaic’; and some mapped breaks between polygons may comprise only narrow transmission line routes that do not prevent effective continuity.

Where the conservation significance is anomalous or marginal, the expert panel should refer to the ratings applied to each of the criteria. “Medium” ratings will be particularly useful for this review.

Even where information on the recorded locations of rare and threatened species is available as GIS data, caution should be exercised and expert opinion sought. Species records can reflect survey effort as much as actual distribution. For this reason, species records are more appropriately considered as supplementary criteria, rather than as “first cut” diagnostic criteria.

These supplementary criteria cannot downgrade the significance of a remnant unit, but can result in upgrades, providing the reasons for any change are clearly documented and relate to the following objectives:

H: Other Habitat for ‘At Risk’ Species

- Does the known presence of endangered, vulnerable or rare (EVR) species scheduled under the *Nature Conservation (Wildlife) Regulation 1994*, or species at risk at regional level, warrant change to the “1st cut” conservation significance of this remnant unit eg. Is it critical habitat for the species or important for part of its life cycle, does it represent a significant part of the known geographic range, or does it support a high proportion of the known population etc ?

BASIC - Regional GIS Data on location of scheduled species and species at regional risk, Vegetation Maps, NatureSearch, HERBRECS

INTERMEDIATE - Field surveys of likely habitats and/or broadscale scans

ADVANCED - Intensive surveys of likely habitats.

Notes. The term ‘species’ includes other taxa.

Essential breeding areas of EVR species that can be associated with particular polygons are considered under Diagnostic Criterion A.

The reliability of data linking species to remnant units should also be documented.

I: Habitat for Other Species

- Does the known presence of locally significant, ‘icon’ or other species, sub-species or locally endemic variants, or migratory species, or populations that are isolated or at their geographic range limits, warrant change to the “1st cut” conservation significance of this

remnant unit eg. Is it critical habitat for the species or important for part of its life cycle, does it represent a significant part of the known geographic range or distribution, or does it support a high proportion of the known population etc ?

BASIC - Regional GIS Data on location of species Vegetation Maps, NatureSearch, HERBRECS,
INTERMEDIATE - Field surveys of likely habitats and/or broadscale scans
ADVANCED - Intensive surveys of likely habitats.

Note: the reliability of data linking species to remnant units should also be documented.

J: Localised Contribution to Biodiversity

- Is the area of such local importance as a centre for biodiversity (eg shrubby communities on siliceous soils, rainforest remnants, moist mountain tops) that the “1st cut” of conservation significance should be upgraded, taking into account the potential for enhancement and maintenance through appropriate planning and management ?
- Is the refuge quality (ie the level at which it is buffered/protected from natural perturbation or anthropogenic disturbance) at a level which warrants a change to the “1st cut” of conservation significance, taking into account the extent of past, current or anticipated habitat removal in surrounding areas of habitat ?
- Does the remnant unit include an artificial waterbody or managed/manipulated wetland of ecological significance ?
- Does the remnant unit contain hollow-bearing trees that provide habitat for arboreal mammals and nesting birds etc. ?

BASIC - Vegetation Maps, NatureSearch, HERBRECS,
INTERMEDIATE - Field surveys of likely habitats and/or broadscale scans
ADVANCED - Intensive surveys of likely habitats.

K: Corridor Links

- Is the level and quality of links between non-contiguous remnants high enough and important enough to warrant a change to the “1st cut” of conservation significance (eg riparian habitats, corridors and ‘stepping stones’), taking into account the potential for enhancement and maintenance through appropriate planning and management ?

BASIC - Vegetation Maps, NatureSearch, HERBRECS,
INTERMEDIATE - Field surveys of likely habitats and/or broadscale scans
ADVANCED - Intensive surveys of likely habitats

Note: Physical connection between contiguous remnant units is addressed in Diagnostic Criterion G (Context & Connection).

L: Geomorphological Variation

- Do the geomorphological and ecological variations within the remnant warrant a change to the “1st cut” of conservation significance (because they indicate likely habitat diversity and ecosystem micro-variation)?

BASIC - Vegetation Maps, NatureSearch, HERBRECS,

INTERMEDIATE - Field surveys of likely habitats and/or broadscale scans

ADVANCED - Intensive surveys of likely habitats.

M: Other Ecosystem Values

- Are there other ecological processes and values of the ecosystem associated with this remnant that warrant a change to the “1st cut” of conservation significance?

BASIC - Vegetation Maps, NatureSearch, HERBRECS,

INTERMEDIATE - Field surveys of likely habitats and/or broadscale scans

ADVANCED - Intensive surveys of likely habitats.

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Table 1 : FILTERING COMBINATIONS (Data Query Logic) to identify '1st Cut' CONSERVATION SIGNIFICANCE

Conservation Significance of Remnant Units	Query No.	A: Essential Habitat for 'At Risk' spp.		B: Ecosystem Value		C: Remnant Size		D: Relative Size of Ecosystem	
S: State	1	A: VERY HIGH	<u>OR</u>	B1: VERY HIGH		N/R		N/R	
<u>OR</u>	2	N/R		B1: HIGH		N/R	<u>&</u>	D1: VERY HIGH	
<u>OR</u>	3	N/R		B1: HIGH	<u>&</u>	C: HIGH	<u>&</u>	D1: HIGH	<u>&</u>
<u>OR</u>	4	N/R		N/R		C: VERY HIGH	<u>&</u>	D1: VERY HIGH	<u>&</u>
<u>OR</u>	5	N/R		N/R		N/R		D1: VERY HIGH	<u>&</u>
R: Regional	6	N/R		B1: HIGH		N/R		N/R	
<u>OR</u>	7	N/R		B2: VERY HIGH		N/R		N/R	
<u>OR</u>	8	A: HIGH	<u>OR</u>	B2: HIGH		N/R	<u>&</u>	D2: VERY HIGH	
<u>OR</u>	9	N/R		N/R		C: VERY HIGH	<u>&</u>	D2: VERY HIGH	<u>&</u>
<u>OR</u>	10	N/R		N/R		C: VERY HIGH		N/R	<u>&</u>
<u>OR</u>	11	N/R		B2: HIGH	<u>&</u>	C: HIGH	<u>&</u>	D2: HIGH ²	<u>OR</u>
<u>OR</u>	12	N/R		N/R		N/R		D2: VERY HIGH	<u>&</u>
L: Local	13	N/R		B2: HIGH		N/R		N/R	
<u>OR</u>	14	N/R		B3: VERY HIGH		N/R		N/R	
<u>OR</u>	15	A: HIGH		B3: HIGH		N/R	<u>&</u>	D3: VERY HIGH	
<u>OR</u>	16	N/R		N/R		C: VERY HIGH	<u>&</u>	D3: VERY HIGH	<u>&</u>
<u>OR</u>	17	N/R		N/R		C: VERY HIGH		N/R	
<u>OR</u>	18	N/R	<u>&</u>	B3: HIGH	<u>&</u>	C: HIGH	<u>&</u>	D3: HIGH ²	<u>OR</u>
<u>OR</u>	19	N/R		N/R		N/R		D3: VERY HIGH	<u>&</u>

Notes: The assessment is progressive ie. a query is 'triggerred' only if the preceding set has not been satisfied.

Criteria B & D vary according to the scale (regional, province, local government) – all the others are independent of scale

N/R = Not Relevant

VERY HIGH² : A single 'Very High' score is not sufficient - at least two of the criteria (D, E, F and G) must be rated as "Very High" to qualify as significant

HIGH² : A single 'High' score is not sufficient - at least two of the criteria (D, E, F and G) must be rated as "High" to qualify as significant

'OR' = Options which apply only to the query immediately preceding the 'OR'