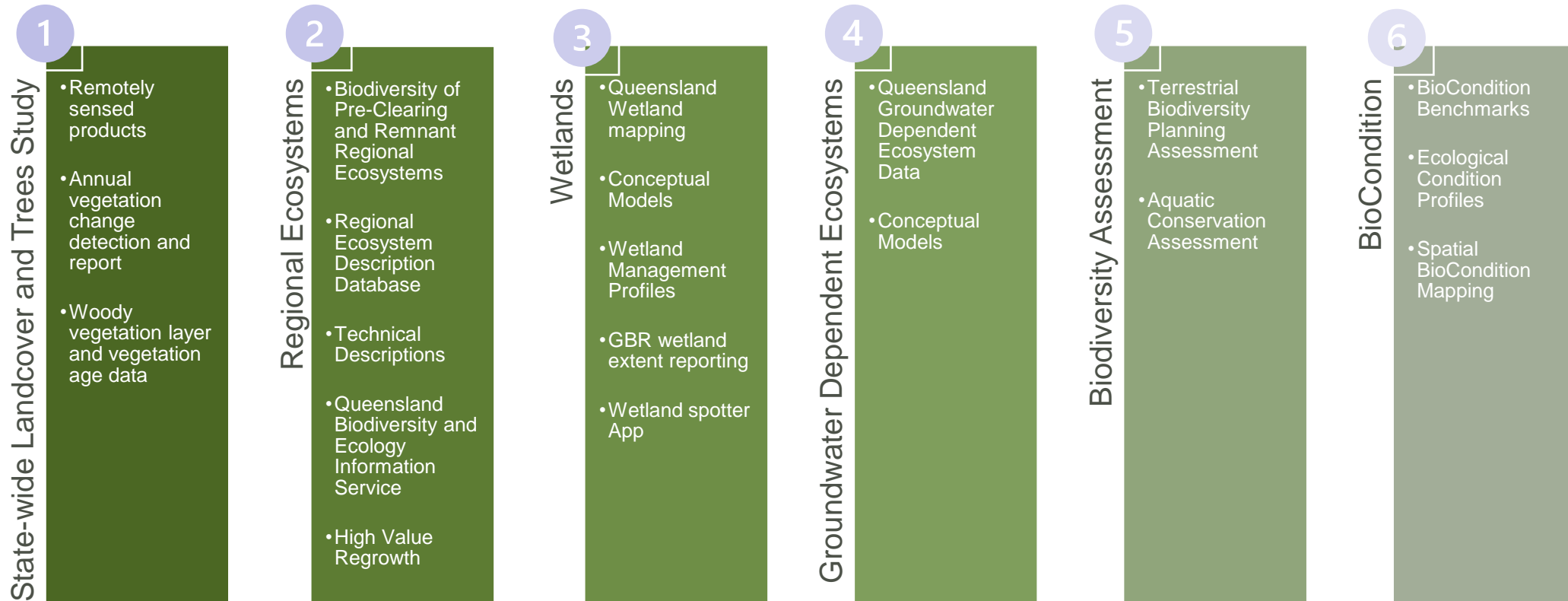
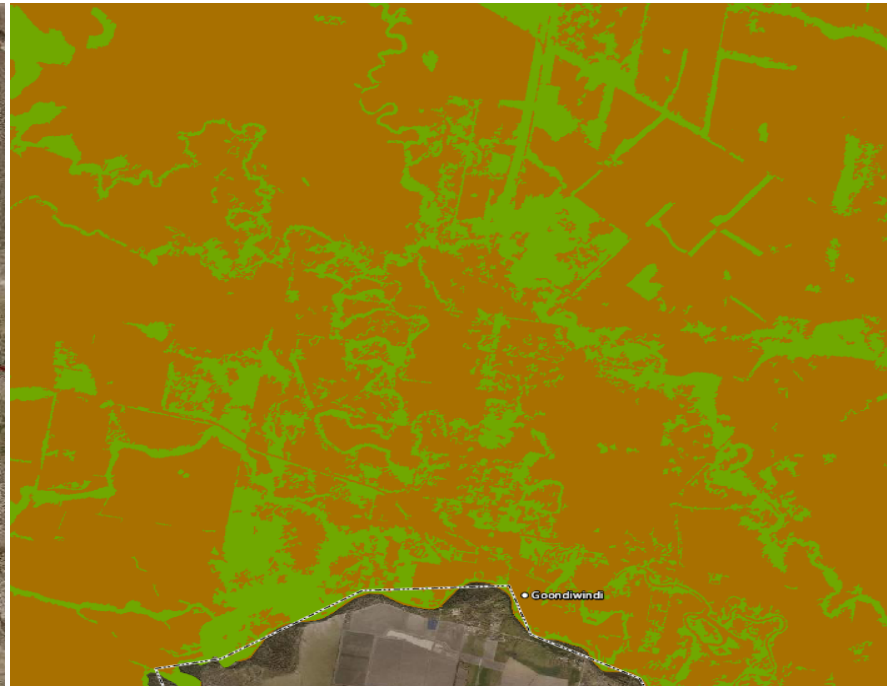


Overview of land-based ecosystem products



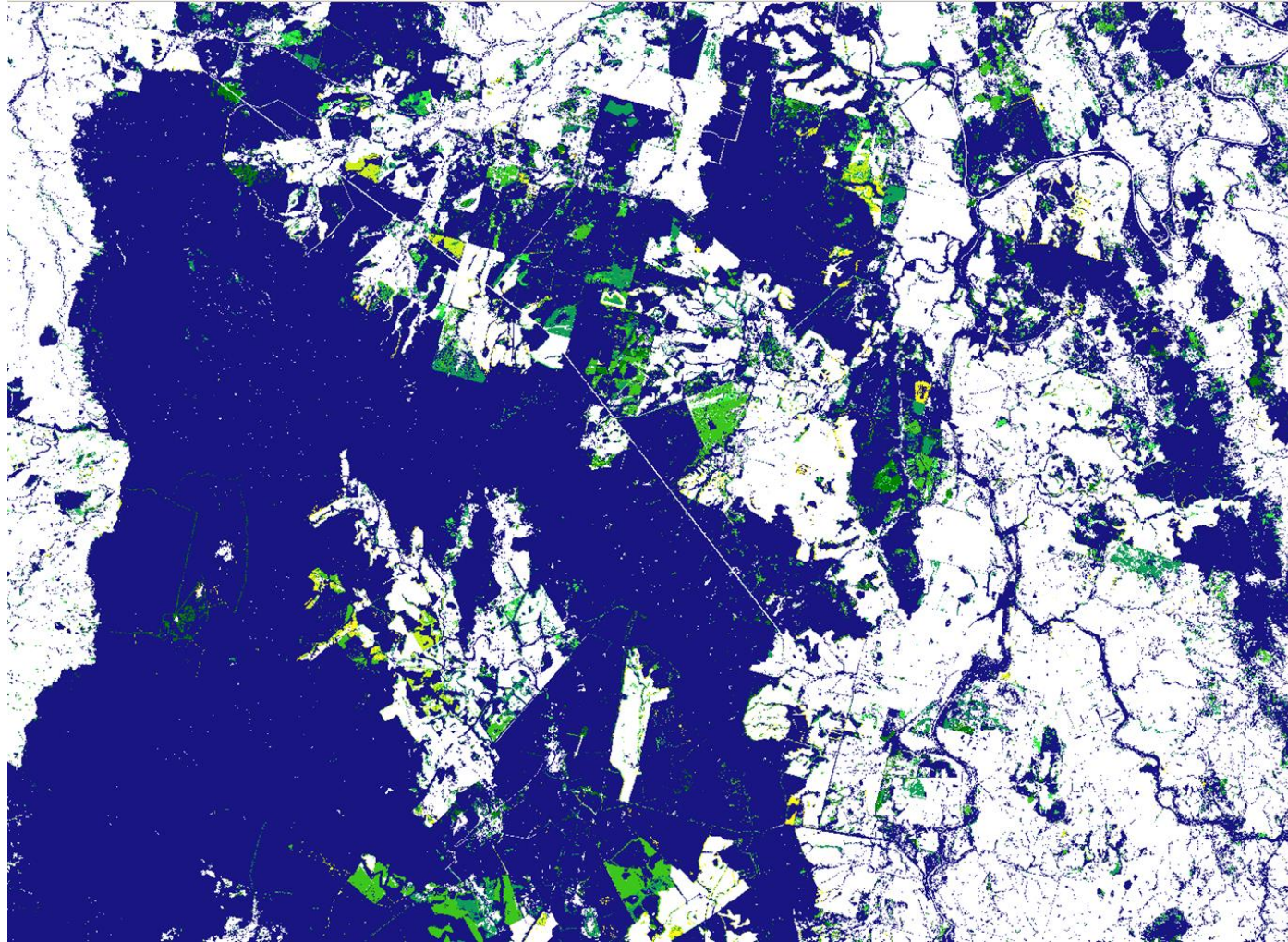
Statewide Landcover and Trees Study (SLATS)

- Land cover change monitoring program with specific focus on woody vegetation extent and change
- Has been operating since mid-1990s, primarily focussed on land clearing monitoring to support the Vegetation Management Framework in Queensland
- SLATS now maps and attributes full and partial clearing events, and the regrowth of woody vegetation across Queensland



Minimum specifications:
10% canopy cover and 0.5 ha patch/stand size

SLATS – age (since disturbance) estimates



Age (years)



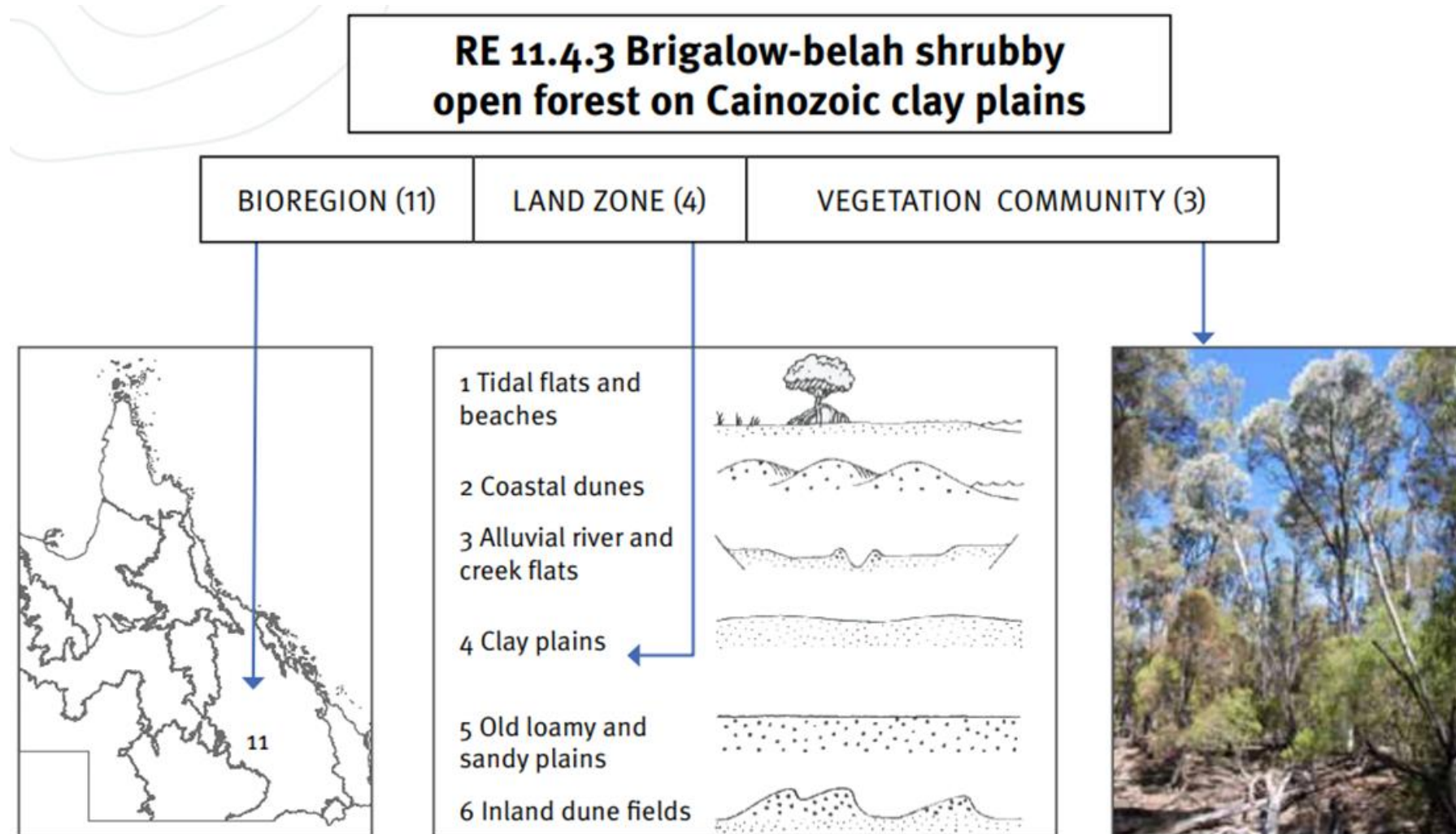
Less than 15 years

Greater than 15 years

Regional Ecosystems

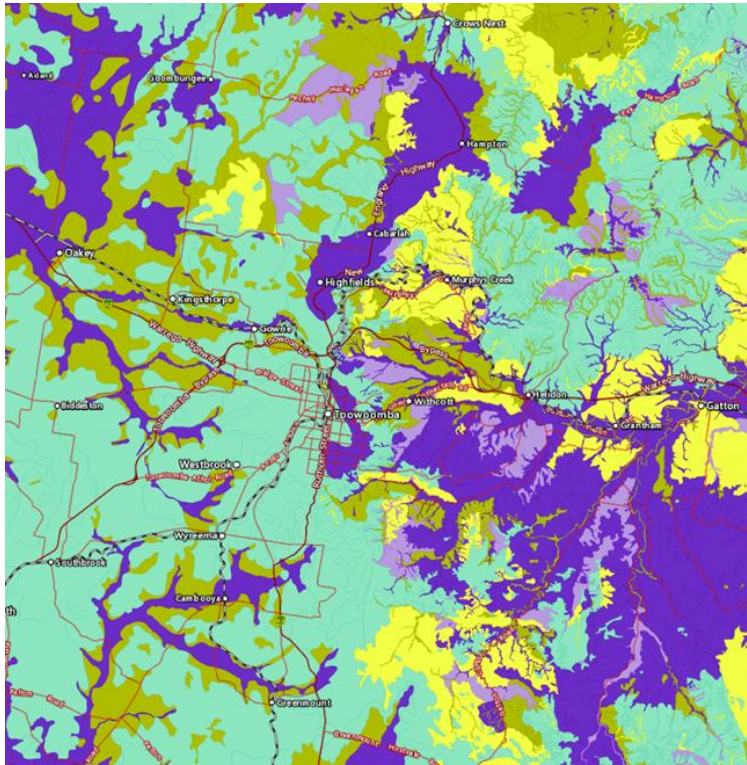
- In Queensland, the regional ecosystems (REs) mapping and framework provides foundational ecosystems related mapping and information
- The RE framework was developed to provide a systematic means of describing and analysing biodiversity across the variable environments of the State (Sattler 1999)
- REs are vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil
- The classification of vegetation communities as regional ecosystems recognises the interaction between geology, landform, soils and vegetation patterns and hence, the way the landscape is broadly functioning.
- REs represent different types of 'country'.

Regional Ecosystem classification

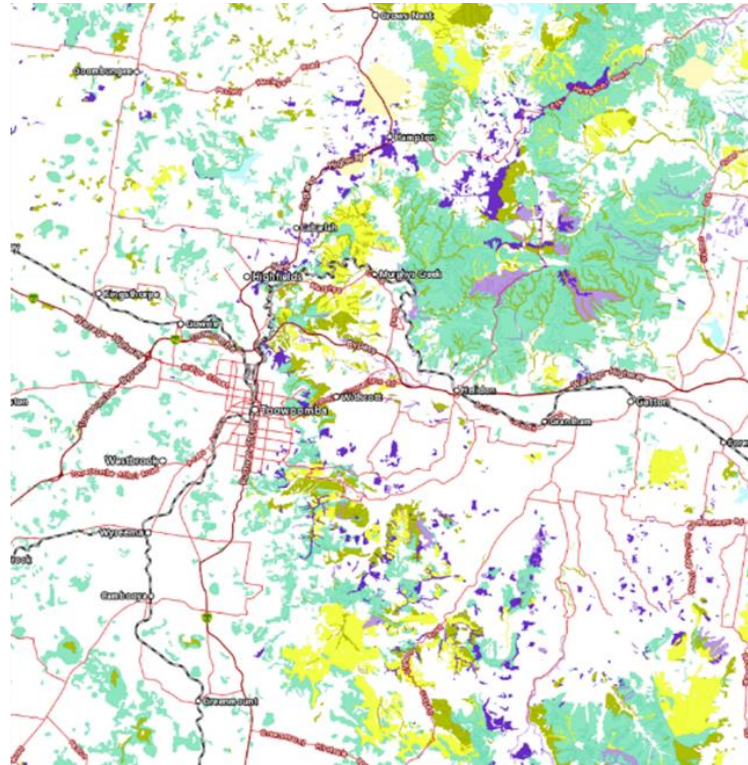


RE mapping program includes:

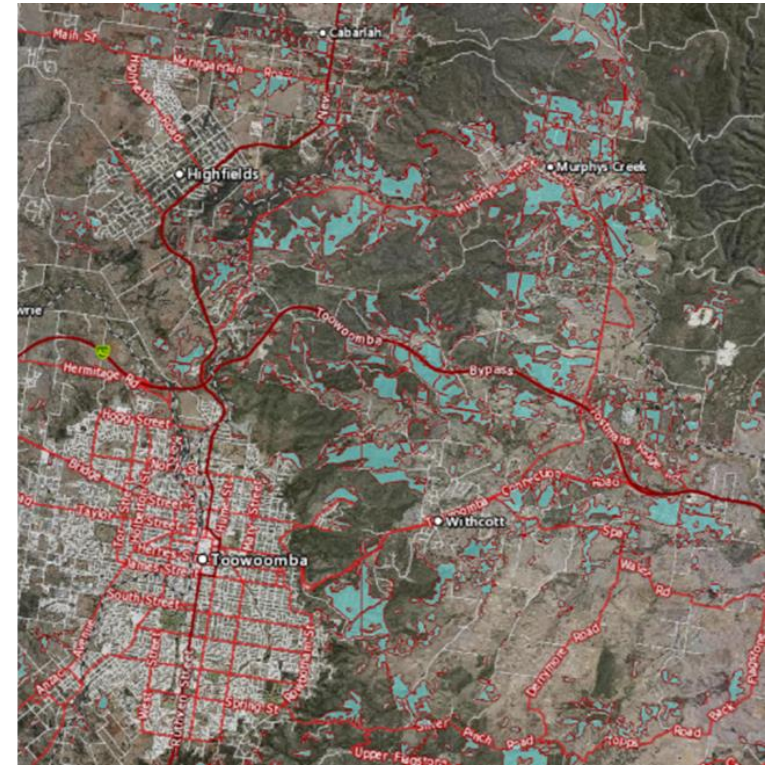
Pre-clearing REs



Remnant 2019 REs



Since 2018 High Value Regrowth (HVR)
Non-remnant native vegetation that hasn't been cleared for
15 years or more.



Regional Ecosystem map scale

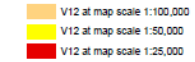
- Entire state mapped at 1:100,000 scale or better

REGIONAL ECOSYSTEMS OF QUEENSLAND

KEY TO MAP SCALE

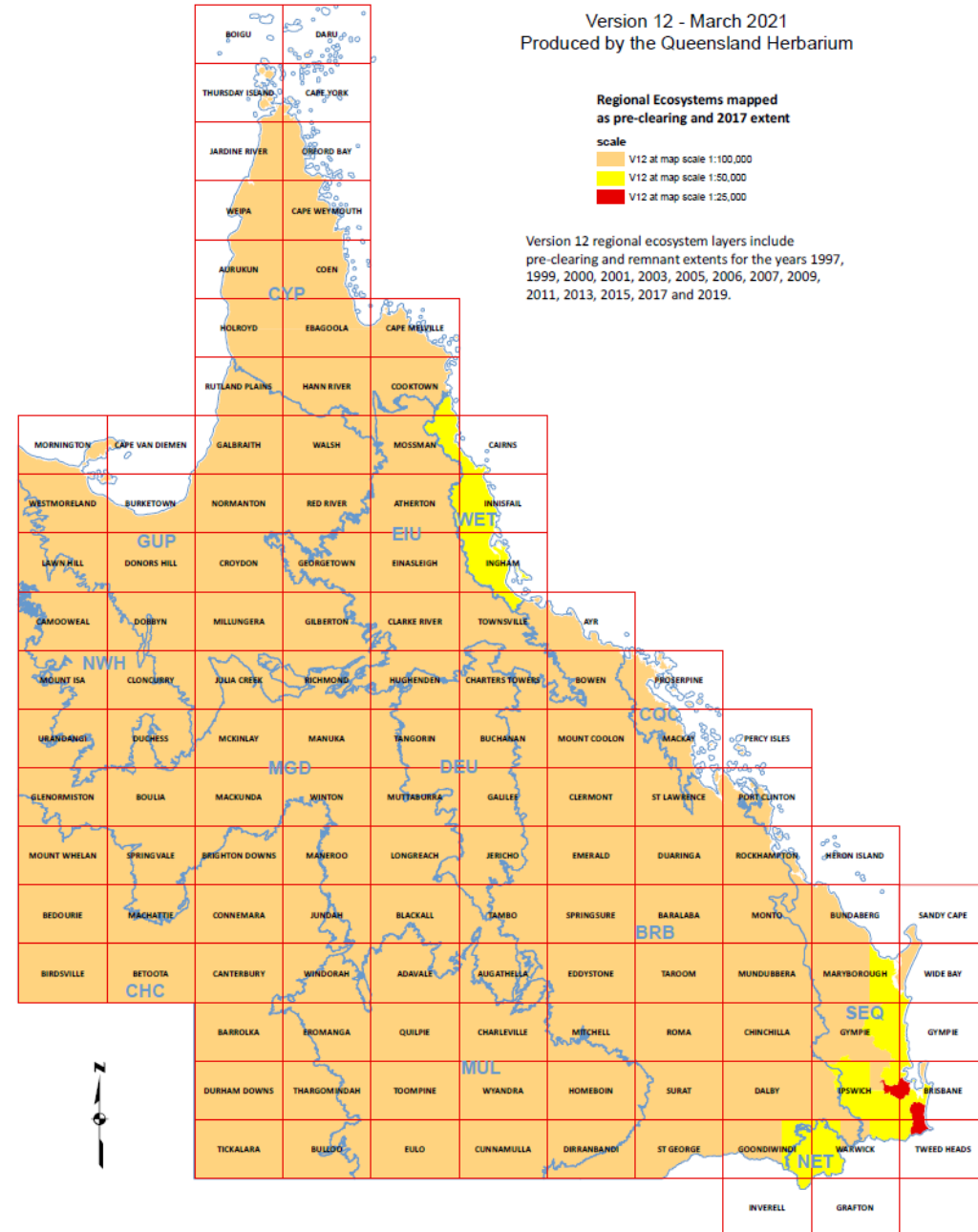
Version 12 - March 2021
Produced by the Queensland Herbarium

Regional Ecosystems mapped as pre-clearing and 2017 extent

scale


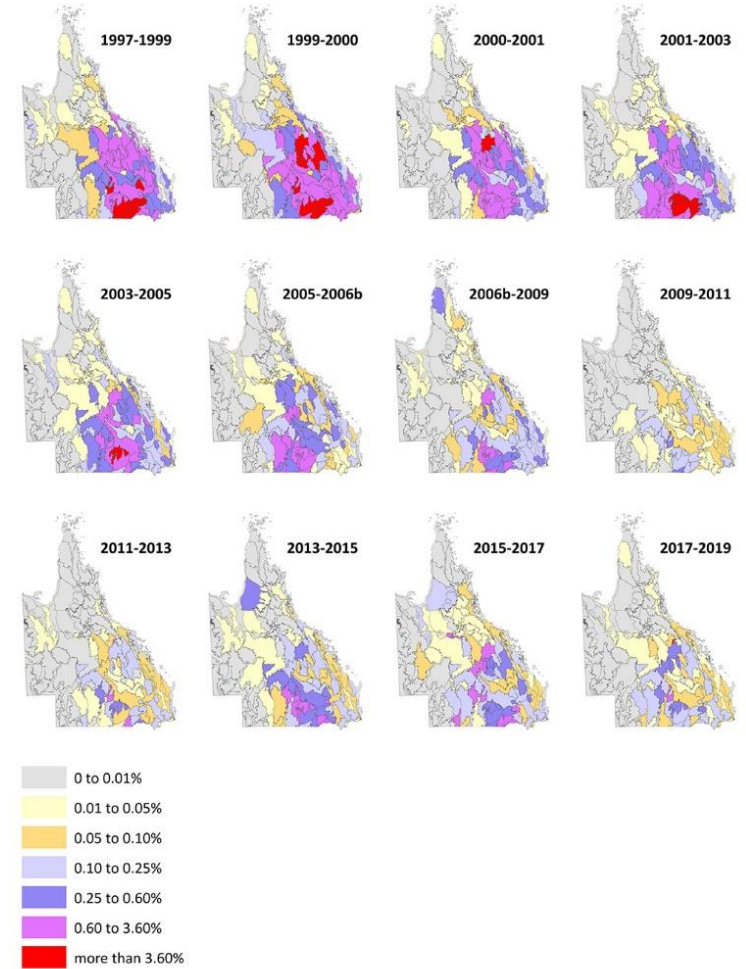
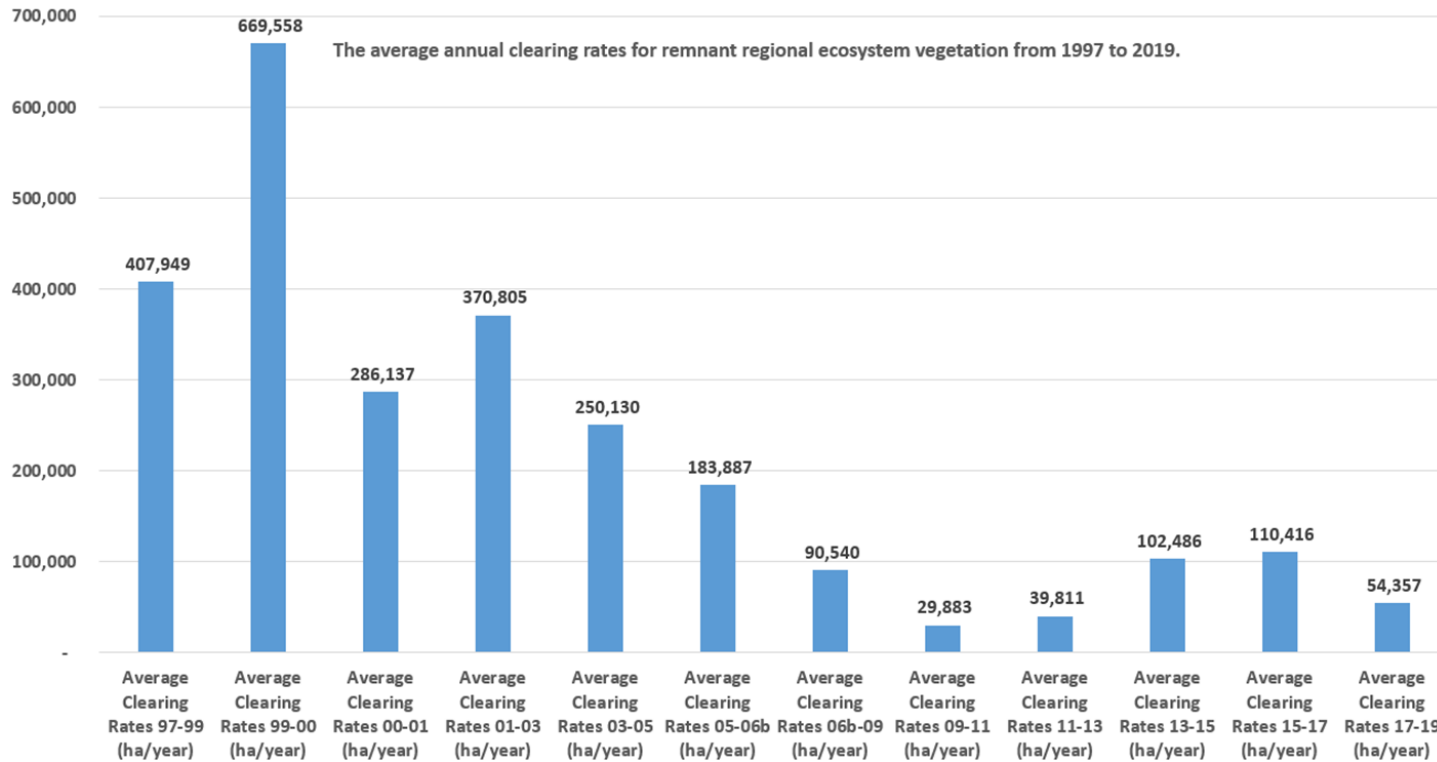
 V12 at map scale 1:100,000
 V12 at map scale 1:50,000
 V12 at map scale 1:25,000

Version 12 regional ecosystem layers include pre-clearing and remnant extents for the years 1997, 1999, 2000, 2001, 2003, 2005, 2006, 2007, 2009, 2011, 2013, 2015, 2017 and 2019.



Regional Ecosystems Statistics

Reporting of regional ecosystem statistics available by: subregion, catchment, natural resource management area, local government area, electoral district



Vegetation Management Act Class and EP Act Biodiversity Status

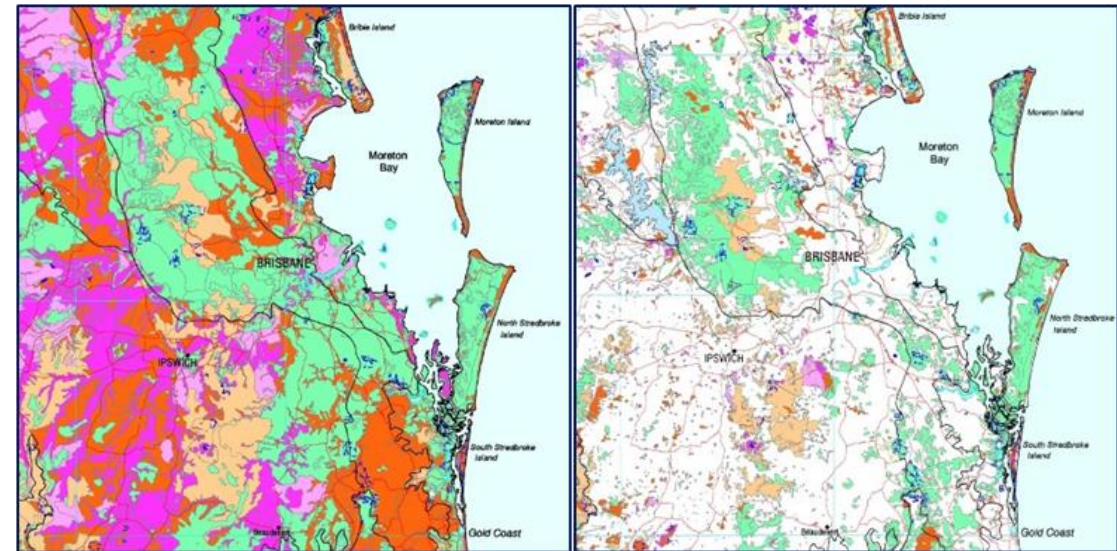
- REs are assigned a class for Vegetation Management Act purposes based on how much of their mapped pre-clearing extent has been cleared for each of the state's 1,449 regional ecosystems.

Endangered <10% of pre-clearing area remains

Of concern 10-30% of pre-clearing area remains

Least concern >30% of pre-clearing area remains

- Biodiversity status uses these concepts plus info about degradation or threatening processes to elevate status

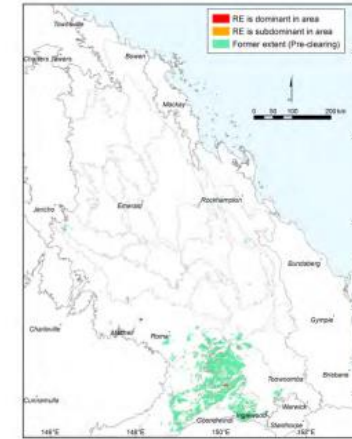


Pink = Endangered
Orange = Of concern
Green = least concern

Field data, RE technical descriptions and BioCondition benchmarks

- The entire RE mapping program is underpinned by the collection of detailed field and site data and ground truthing of maps.
- Comprehensive technical descriptions and benchmarks based on detailed data sites have been produced to describe the quantitative characteristics of individual REs to help guide revegetation projects and assess and monitor offsets.
- The ecological field data that underpins the RE mapping is available to general public through the <https://publications.qld.gov.au/dataset/re-technical-descriptions> <https://www.qld.gov.au/environment/plants-animals/biodiversity/benchmarks/>.
- The ecological field data that underpins the RE mapping is available to general public through the [TERN AEKOS data portal](#) or by request to the Herbarium.

Acacia harpophylla and/or Casuarina cristata shrubby open forest on Cainozoic clay plains



Don Butler

Pre-clearing area (ha), remnant area (ha) and per cent remaining: 1,548,281 74,017 5%

Species recorded: Total: 171; woody: 41; ground: 142; Avg. spp./site: 38.7; std dev.: 8.4, 9 site(s)

Basal area: Avg./site: 23.4 m²/ha, range: 8.5 - 50 m²/ha, std. deviation: 10 m²/ha, 10 site(s)

Structural formation: Open-forest: 55%; woodland: 36%; low open-forest: 9%, 11 site(s)

Representative_sites 16553, 16638, 16653, 16654, 16744, 16746, 16930, 16931, 16932, 17103, 17491.

Stratum: Emergent
 Height avg. = 16.0m, 1 site
 Crown cover avg. = 2.0%, 1 site

Frequent species (cover, frequency): *Acacia harpophylla* (1, 9%), *Casuarina cristata* (9%), *Eucalyptus woolliana* (1, 9%)

Stratum: Tree 1
 Height avg. = 18.1m, range 8.5-24m, 11 sites
 Crown cover avg. = 43.5%, range 30.0-61.0%, 11 sites

Dominant species (relative cover, frequency): *Acacia harpophylla* (66, 73%), *Casuarina cristata* (50, 82%)

Frequent species (cover, frequency): *Baumea indet.* (5, 9%), *Casuarina cristata* (19, 82%), *Acacia harpophylla* (32, 73%), *Amyema quandang* (18%), *Eucalyptus woolliana* (2, 18%), *Lysiphillum carronii* (2, 9%), *Parsonia lanceolata* (1, 9%)

Stratum: Tree 2
 Height avg. = 11.0m, range 7.5-17m, 9 sites
 Crown cover avg. = 8.9%, range 1.0-24.0%, 9 sites

Dominant species (relative cover, frequency): *Acacia harpophylla* (65, 73%), *Casuarina cristata* (35, 55%)

Frequent species (cover, frequency): *Acacia harpophylla* (7, 73%), *Casuarina cristata* (3, 55%), *Alectryon diversifolius* (1, 9%), *Brachychiton rupestris* (9%), *Eremophila mitchellii* (1, 9%), *Eucalyptus populnea* (9%), *Geijera parviflora* (2, 9%), *Opuntia tomentosa* * (9%)

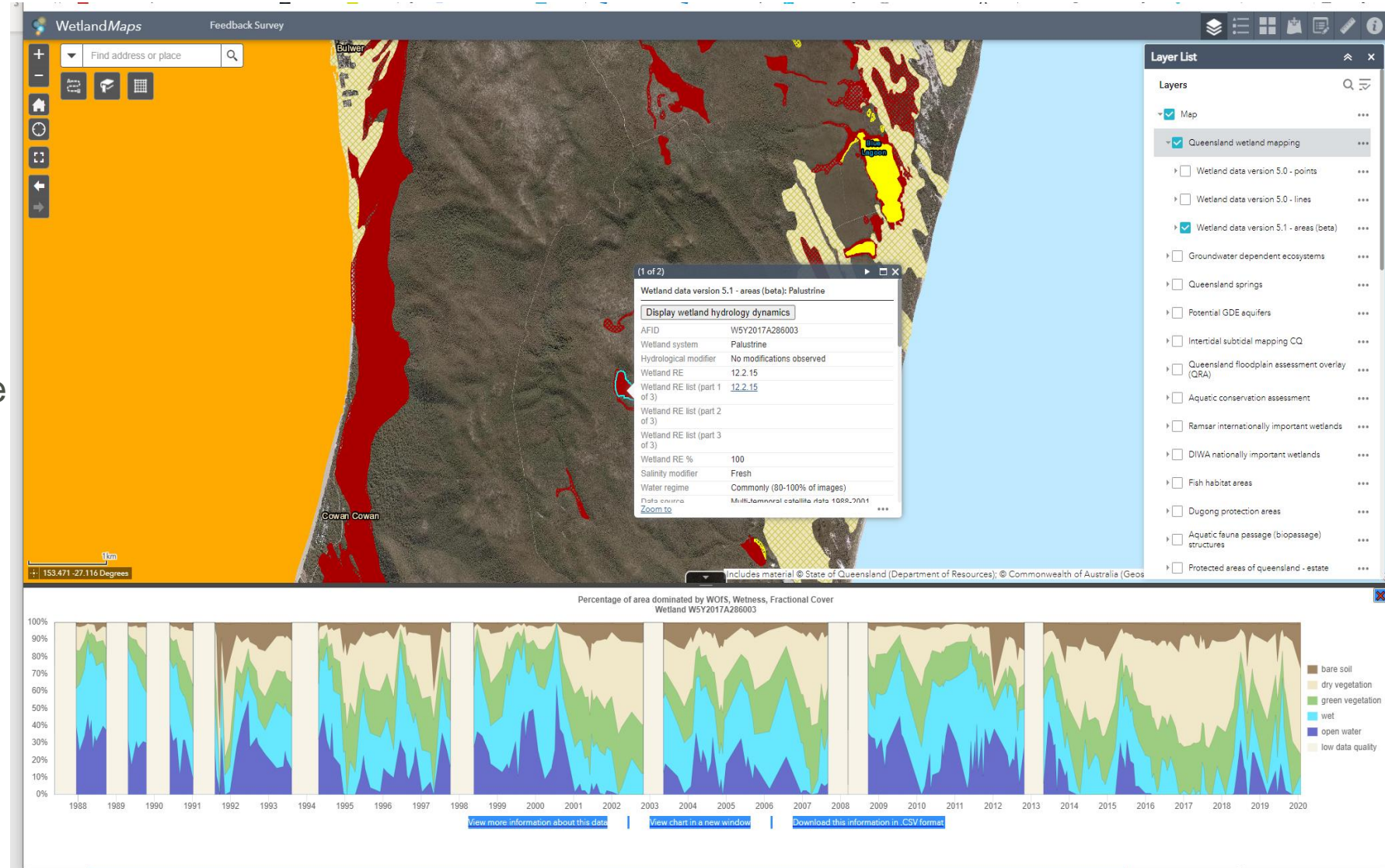
Dominant species: Relative cover (mean of cover of species / total cover of all species in that stratum for all values > zero) and frequency (percent of total sites) ordered by decreasing relative abundance. Up to five most dominant species with frequency > 20% listed for each stratum, (only comprehensive sites used for ground stratum).

Frequent species: Cover (mean of all values > zero) and frequency (percent of total sites) of all species occurring in more than 5% of sites ordered by decreasing frequency. Ground layer species % (of comprehensive sites) are listed as either graminoid or forb.

Naturalised species have an asterisk (*) after the name. indot. after listed name = indeterminate species or genus

Wetlands

- The Queensland wetland program maps wetland extent and wetland attributes traditionally every 4 years but is now moving to a two year production and reporting cycle
- Constructed from and remotely sensed information and RE mapping
- Wetland characteristics interpreted from 30 years of landsat satellite imagery is now available for palustrine and lacustrine wetlands



Wetland Statistics and Reef Water Quality Reporting

Reef Water Quality Report Card 2020

Change date

Overview

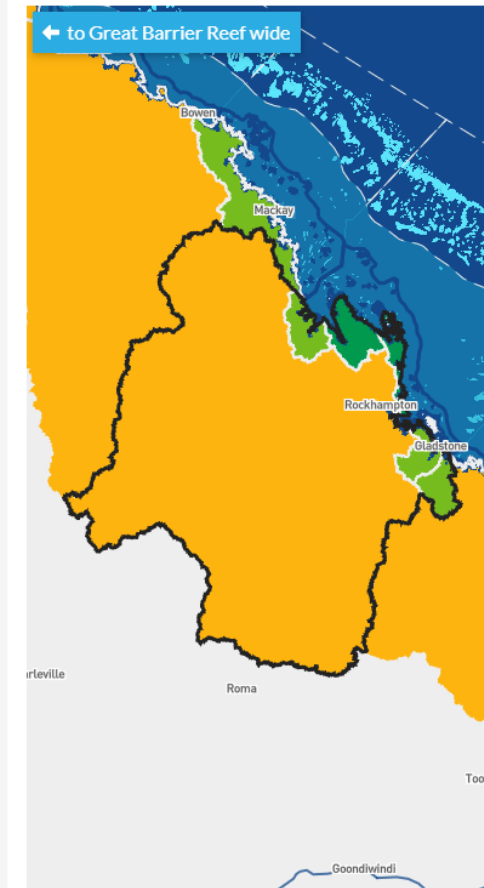
Reef and wetland condition

2025 catchment targets

Showing Wetland extent > Fitzroy region

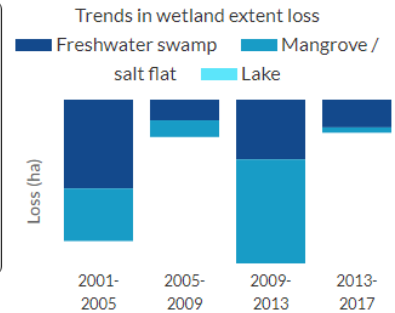
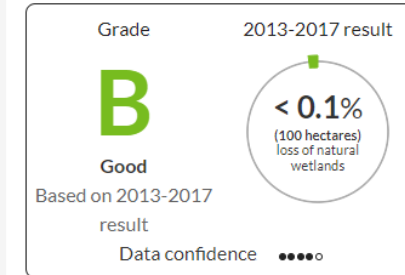
Change indicator

Change location



2025 catchment management target: No loss of the extent of natural wetlands (lakes, swamps and estuarine wetlands).

Results



About the results

The rate of loss of natural wetlands remained below 0.1% between 2013 and 2017.

There was a loss of 100 hectares (<0.1%) due to vegetated freshwater swamps being cleared for grazing, cropping and mining in the Fitzroy sub-catchment (32 hectares, 0.6%) and Mackenzie (35 hectares, 0.9%) sub-catchment.

Wetland extents

Based on wetland mapping version 5.0

Queensland wetland area by system 2017

| System | Area (km ²) | % wetlands area | % total area |
|--------------------------------|-------------------------|-----------------|--------------|
| Artificial and highly modified | 3,382 | 4.4% | 0.2% |
| Estuarine | 11,630 | 15.2% | 0.7% |
| Lacustrine | 5,487 | 7.2% | 0.3% |
| Palustrine | 31,322 | 40.9% | 1.8% |
| Riverine | 24,806 | 32.4% | 1.4% |
| Total | 76,627 | 100.0% | 4.4% |

There are approximately 125,948 lacustrine/palustrine wetlands in Queensland.

[View wetland system extents for selected regions](#)

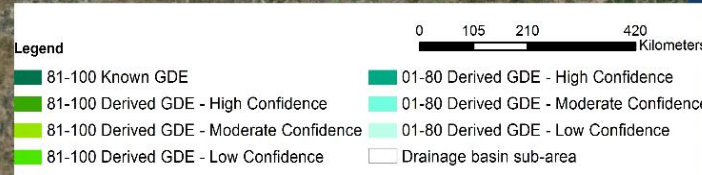
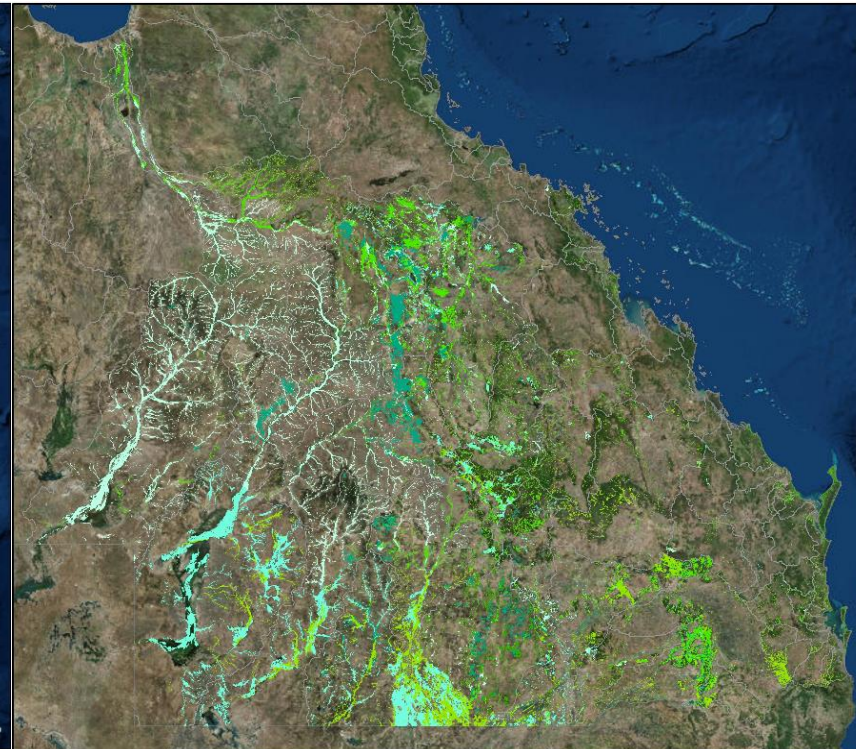
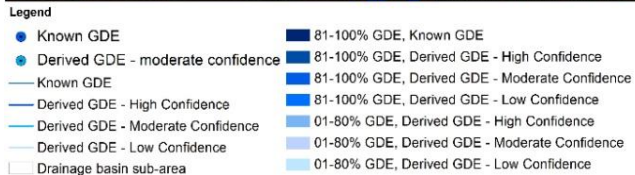
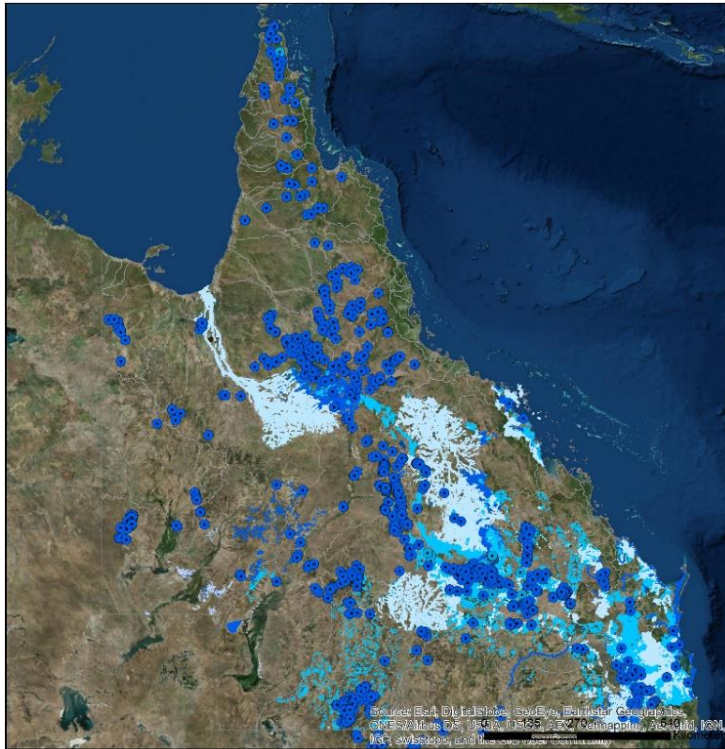
Queensland wetland area by habitat 2017

| Habitat | Area (km ²) | % wetlands area | % total area |
|--|-------------------------|-----------------|--------------|
| Estuarine - mangroves and related tree communities | 4,965.8 | 6.5% | 0.3% |
| Estuarine - salt flats and saltmarshes | 6,664.5 | 8.7% | 0.4% |
| Coastal and sub-coastal saline swamp | 351.8 | 0.5% | 0.0% |
| Coastal and sub-coastal non-floodplain tree swamp—Melaleuca spp. and Eucalyptus spp. | 2,643.9 | 3.5% | 0.2% |
| Coastal and sub-coastal non-floodplain wet heath swamp | 210.9 | 0.3% | 0.0% |
| Coastal and sub-coastal non-floodplain grass sedge and herb swamp | 824.7 | 1.1% | 0.0% |
| Coastal and sub-coastal non-floodplain spring swamp | 7.7 | 0.0% | 0.0% |
| Coastal and sub-coastal floodplain tree swamp—Melaleuca spp. and Eucalyptus spp. | 1,108.1 | 1.4% | 0.1% |
| Coastal and sub-coastal floodplain wet heath swamp | 122.3 | 0.2% | 0.0% |
| Coastal and sub-coastal floodplain grass, sedge, herb swamp | 1,884.9 | 2.5% | 0.1% |
| Coastal and sub-coastal floodplain lignum swamps | 1.7 | 0.0% | 0.0% |

Groundwater Dependent Ecosystems

Surface expression GDEs

Terrestrial GDEs



- 54% of Queensland surveyed for GDEs
- Remaining GBR catchments planned for 2023-25

Terrestrial and Aquatic Conservation Assessments

Biodiversity Planning Assessments (BPA)

Aquatic Conservation Assessments (ACA)

- Consistent approach for assessing relative ecological/conservation values
- Not social or economic
- Tenure independent
- Combines raw and analysed data as objectively as possible
- Transparent, repeatable
- Decision support tool
- Criteria are designed to be standalone

Applications

- VMA Essential Habitat
- Matters of State Environmental Significance
- Protected Plants Flora Survey Trigger Map
- Assessment of development applications
- Planning schemes
- Protected area identification
- Offsets
- Climate change
- Threatened species recovery plans

Diagnostic Criteria

A: Habitat for CEVNT Taxa

B: Ecosystem Value

C: Tract Size

D: Relative Size of REs

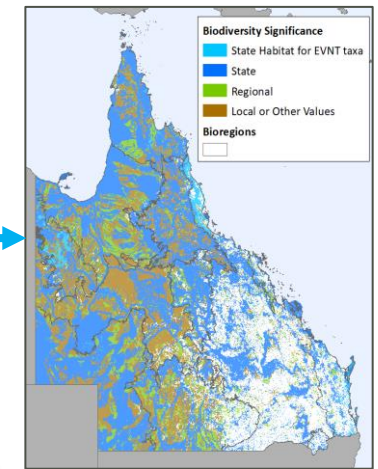
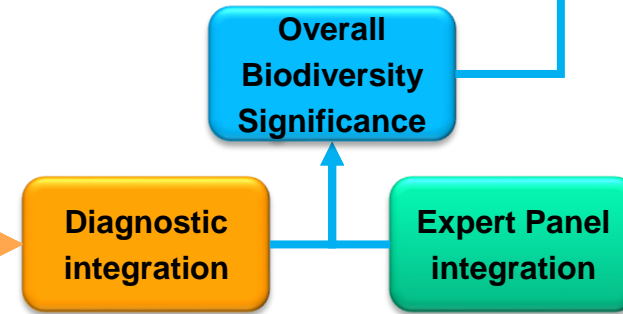
E: Condition

F: Ecosystem Diversity

G: Context & Connection



Biodiversity Planning Assessments



Expert Panel Criteria

H: Habitat for Priority Taxa

I: Special Biodiversity Values
eg centres of endemism, wildlife refugia etc

J: Corridors

K: Threatening Process (Condition)

GBR revision planned for 2023

biodiversity.planning@qld.gov.au



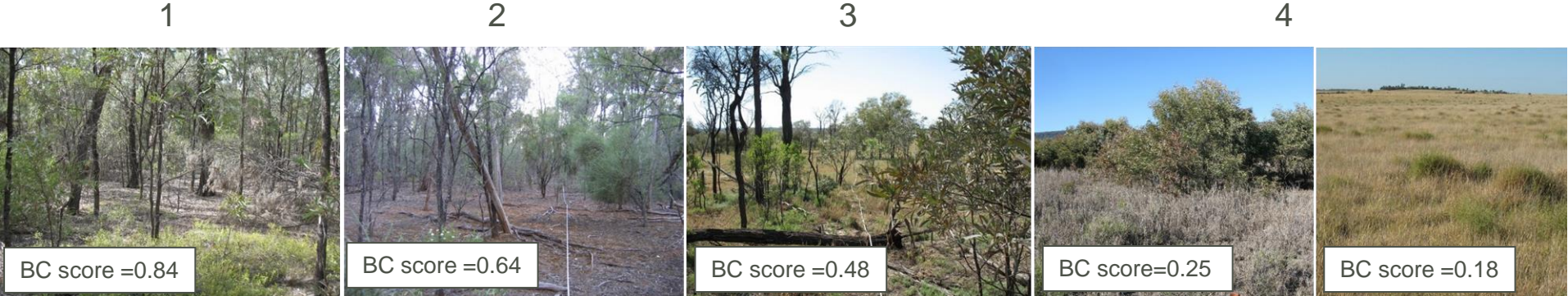
BioCondition and Spatial BioCondition

BioCondition is used for biodiversity monitoring, environmental accounting, State of Environment reporting, ecosystem services, offsets

- Measures the relative capacity of a regional ecosystem to support the suite of species expected to occur in its reference state (i.e. long undisturbed vegetation in the contemporary landscape = Best on Offer)
- Measure is continuous, but can be classed as 1 (good condition) to 4 (poor condition)



Reflects the functional capacity of ecosystems and species (biodiversity)





12.3.3 *Eucalyptus tereticornis* woodland on Quaternary alluvium

Values are for within a 50 x 20 m plot area



Condition class 1

Reference condition, mature and minimal disturbance

- Tree canopy cover: 50-60%; Tree height: >26 m
- Tree subcanopy cover: 10-15%; Tree subcanopy height: > 11 m
- Native shrub cover: 1-5%
- Large trees: > 2 eucalypts > 45 cm DBH
- Coarse Woody Debris: 40-50 m total length
- Species richness: Trees > 4; Shrubs > 4; Grass > 10; Forbs and other > 23
- Ground cover: Perennial grass cover >45%; Organic litter cover >30%
- Non-native plant species: < 2% cover
- Regeneration: >2 tree species in regeneration phase



Condition class 2

Mature, some disturbance e.g. grazing

- Tree canopy cover: 45-50%; Tree height: 20-26 m
- Tree subcanopy cover: 5-10%; Tree subcanopy height: 5-11 m
- Native shrub cover: 1-5%
- Large trees: 1-2 eucalypts > 45 cm DBH
- Coarse Woody Debris: 20-40 m total length
- Species richness: Trees 2-4; Shrubs 2-4; Grass 5-10; Forbs and other 10-23
- Ground cover: Perennial grass cover 20-45%; Organic litter cover 20-30%
- Non-native plant species: 2-15% cover.
- Regeneration: 1-2 tree species in regeneration phase



Condition class 3

Advanced regrowth and/or moderate disturbance e.g. grazing, clearing, frequent low intensity burning

- Tree canopy cover: 10-45%; Tree height: 10-20 m
- Tree subcanopy cover: < 5%; Tree subcanopy height: 2-5 m
- Native shrub cover: < 1% or > 25%
- Large trees: 0-1 eucalypts > 45 cm DBH
- Coarse Woody Debris: < 20 m or > 100 m total length
- Species richness: Trees < 2; Shrubs < 2; Grass < 5; Forbs and other 5-10
- Ground cover: Perennial grass < 20% or > 80%; Organic litter 20-30%
- Non-native plant species: 15-25% cover
- Regeneration: 1-2 trees species in regeneration phase



Condition class 4

Cleared, some regrowth and/or high disturbance e.g. frequent moderate to high intensity burning, weeds

- Tree canopy cover: < 10%; Tree height: 2-10 m
- Tree subcanopy cover: < 5%; Tree subcanopy height: 2-5 m
- Native shrub cover: < 1% or > 25%
- Large trees: 0 eucalypts > 45 cm DBH
- Coarse Woody Debris: < 20 m total length or > 100 m total length
- Species richness: Trees < 2; Shrubs < 2; Grass < 5; Forbs and other < 5
- Ground cover: Perennial grass < 20% or > 80%; Organic litter < 20%
- Non-native plant species: >25% cover
- Regeneration: Nil

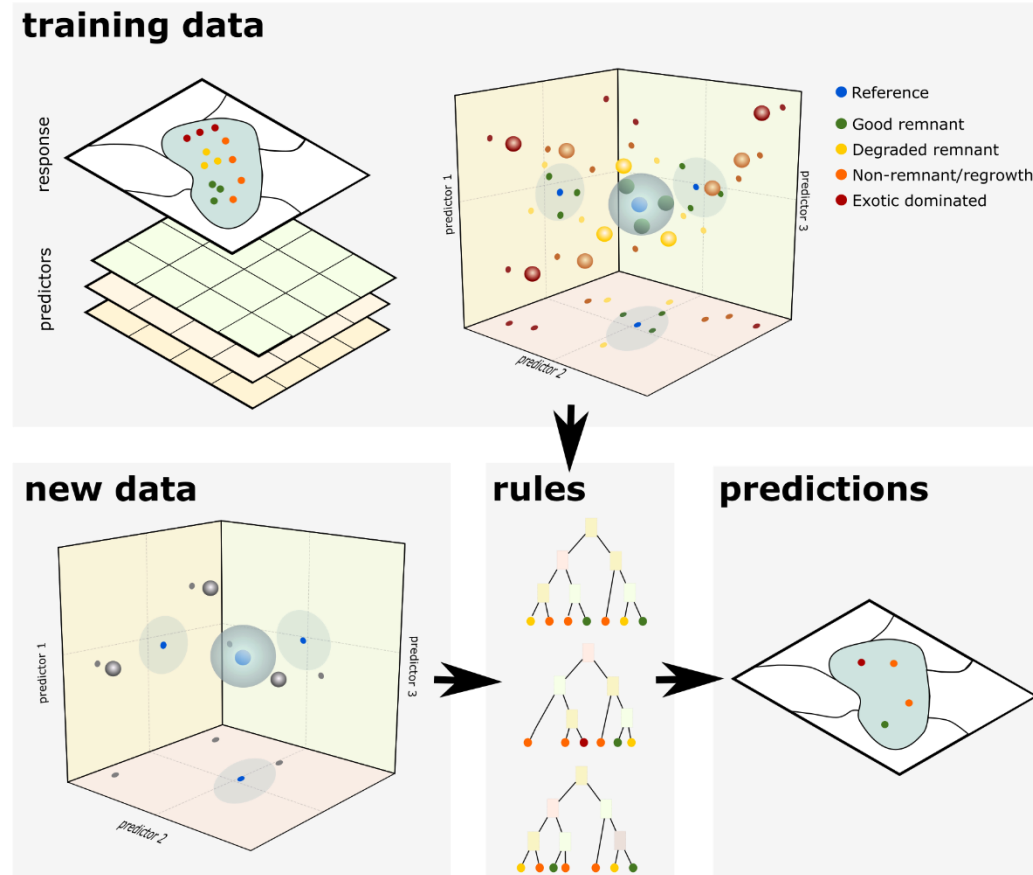
BioCondition- benchmarks and Condition profiles

BioCondition benchmark values

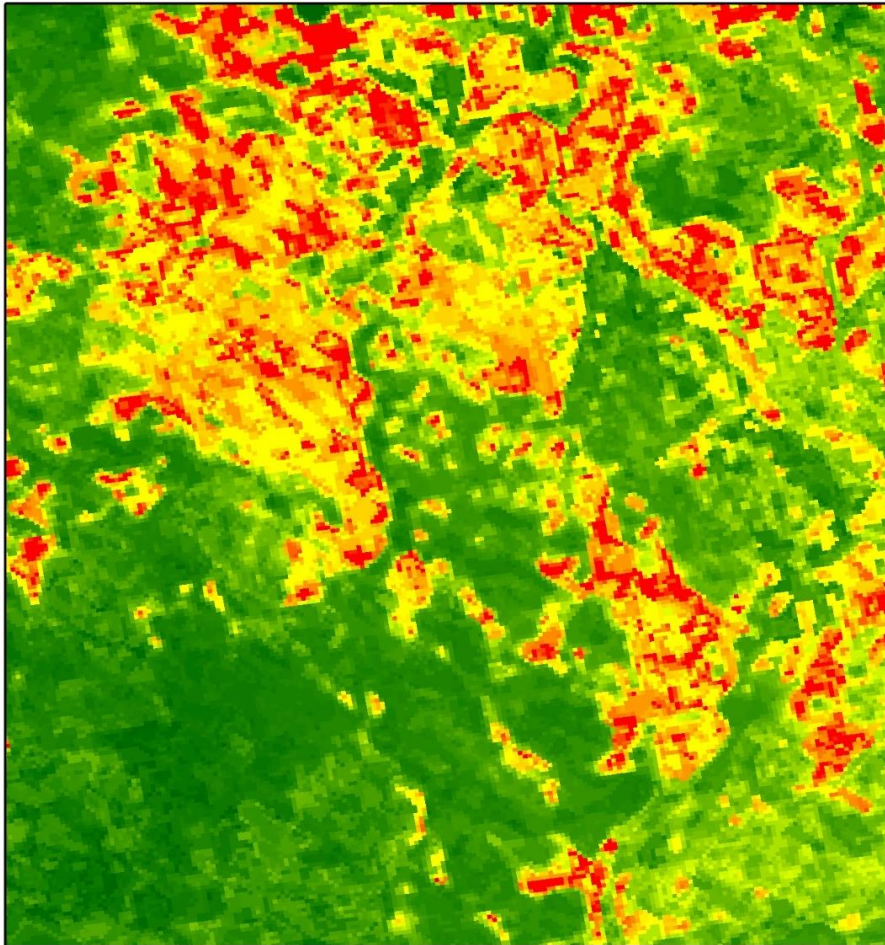
| re_with_dec | max_score_exclude_landscape | recruitment | nn_plant_cover | tree_sp_richness | shrub_sp_richness | grass_sp_richness | forb_other_sp_richness | emergent_canopy_height | tree_canopy_height | tree_subcanopy_height | emergent_canopy_cover | tree_canopy_cover | tree_subcanopy_cover | Large tree threshold_Eucalypt | Large tree threshold_Non eucalypt | tot_num_large_trees_euc_ha | tot_num_large_trees_non_euc_ha | shrub_canopy_cover | native_per_grass | litter_grd_cov | woody_debris_length_ha | reliability | source |
|-------------|-----------------------------|-------------|----------------|------------------|-------------------|-------------------|------------------------|------------------------|--------------------|-----------------------|-----------------------|-------------------|----------------------|-------------------------------|-----------------------------------|----------------------------|--------------------------------|--------------------|------------------|----------------|------------------------|-------------|--------|
| 11.5.4 | 80 | 100 | 0 | 4 | 3 | 13 | 18 | na | 21 | 10 | na | 30 | 24 | 49 | 28 | 7 | 10 | 7 | 30 | 58 | 204 | moderate | 1 Bi |
| 11.5.4a | 80 | 100 | 0 | 8 | 6 | 5 | 8 | na | 19 | 9 | na | 37 | 20 | 44 | 27 | 9 | 22 | 19 | 24 | 71 | 939 | moderate | 1 Ql |
| 11.5.5 | 80 | 100 | 0 | 9 | 6 | 4 | 4 | na | 15 | 8 | na | 41 | 42 | 40 | 25 | 7 | 22 | 2 | 7 | 80 | 182 | high | 2 Ql |
| 11.5.8 | 80 | 100 | 0 | 6 | 2 | 7 | 18 | 21 | 11 | 8 | 4 | 48 | 11 | 44 | 20 | 8 | 24 | 6 | 44 | 23 | 261 | moderate | 4 Bi |
| 11.5.8c | 80 | 100 | 0 | 3 | 7 | 9 | 12 | na | 13 | na | na | 20 | na | 39 | 20 | 10 | 4 | 5 | 34 | 36 | 87 | moderate | 2 Bi |
| 11.5.9 | 80 | 100 | 0 | 3 | 6 | 9 | 11 | na | 17 | 8 | na | 25 | 5 | 41 | 21 | 19 | 1 | 10 | 26 | 30 | 342 | moderate | 2 Bi |
| 11.5.9b | 80 | 100 | 0 | 6 | 6 | 9 | 14 | na | 18 | 10 | na | 25 | 10 | 43 | 23 | 11 | 2 | 9 | 41 | 35 | 263 | high | 10 C |
| 11.5.10 | 80 | 100 | 0 | 4 | 5 | 6 | 8 | na | 6 | na | na | 21 | na | 31 | 19 | 1 | 18 | 6 | 15 | 9 | 101 | moderate | 5 Bi |
| 11.5.12 | 80 | 100 | 0 | 6 | 4 | 6 | 8 | na | 16 | 7 | na | 30 | 20 | 40 | 25 | 8 | 14 | 5 | 21 | 32 | 533 | high | 4 Bi |
| 11.5.12a | 80 | 100 | 0 | 6 | 4 | 6 | 8 | na | 16 | 7 | na | 30 | 20 | 40 | 25 | 8 | 14 | 5 | 21 | 32 | 533 | high | 4 Bi |
| 11.5.13 | 80 | 100 | 0 | 5 | 6 | 10 | 9 | na | 15 | 5 | na | 21 | 6 | 39 | 26 | 13 | 20 | 19 | 27 | 39 | 306 | high | 3 Ql |
| 11.5.15 | 80 | 100 | 0 | 21 | 43 | 2 | 15 | na | 12 | 7 | na | 52 | 45 | na | 30 | na | 113 | 48 | 1 | 67 | 1295 | moderate | 2 Bi |
| 11.5.16 | 80 | 100 | 0 | 3 | 9 | 5 | 12 | na | 13 | 7 | na | 52 | 26 | na | 29 | na | 58 | 24 | 10 | 47 | 1812 | moderate | 1 Bi |
| 11.5.17 | 80 | 100 | 0 | 3 | 1 | 3 | 7 | na | 18 | 8 | na | 41 | 6 | 44 | na | 29 | na | 3 | 20 | 31 | 330 | moderate | 2 Bi |
| 11.5.20 | 80 | 100 | 0 | 3 | 4 | 7 | 13 | na | 23 | 10 | na | 43 | 38 | 46 | 23 | 14 | 10 | 5 | 8 | 57 | 178 | moderate | 2 Bi |
| 11.5.21 | 80 | 100 | 0 | 6 | 10 | 7 | 16 | na | 19 | 9 | na | 41 | 32 | 43 | 28 | 6 | 37 | 40 | 9 | 46 | 738 | high | 5 Ql |
| 11.7.1 | 80 | 100 | 0 | 4 | 8 | 8 | 9 | na | 20 | 9 | na | 27 | 5 | 40 | 24 | 18 | 2 | 10 | 20 | 20 | 424 | moderate | 1 Bi |
| 11.7.2 | 80 | 100 | 0 | 3 | 4 | 5 | 5 | na | 15 | 5 | na | 40 | 4 | 41 | 26 | 10 | 26 | 4 | 15 | 20 | 1214 | high | 1 Bi |
| 11.7.3 | 80 | 100 | 0 | 2 | 4 | 6 | 3 | na | 9 | na | na | 11 | na | 26 | na | 9 | na | 1 | 16 | 20 | 249 | moderate | 2 Bi |
| 11.7.4 | 80 | 100 | 0 | 4 | 6 | 7 | 9 | na | 18 | 9 | na | 29 | 8 | 46 | 26 | 14 | 7 | 7 | 12 | 50 | 320 | moderate | 11 C |

Spatial BC modelling

Vegetation condition (for biodiversity) is modelled at a given location by comparing its remotely-sensed characteristics with a set of reference sites.



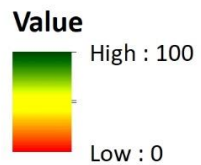
Spatial BioCondition model outputs



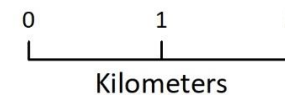
Draft site based Spatial BioCondition prediction



2017 Earth-i satellite imagery

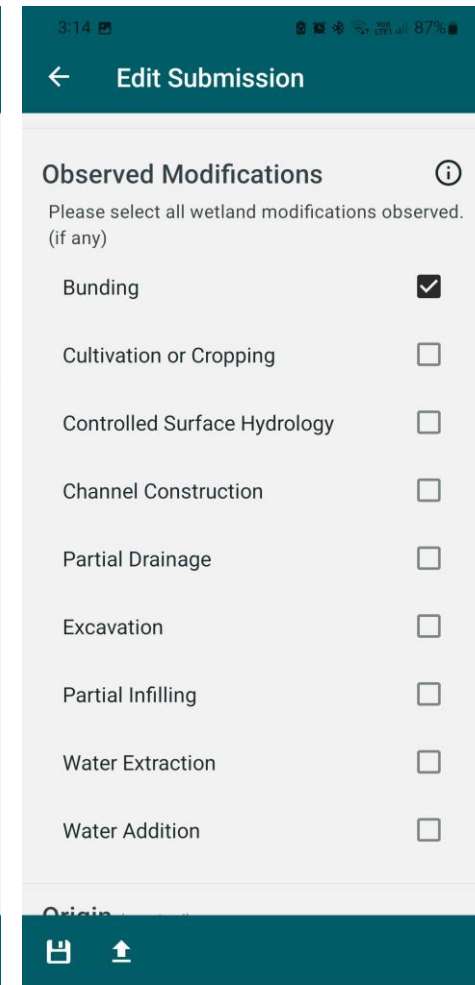
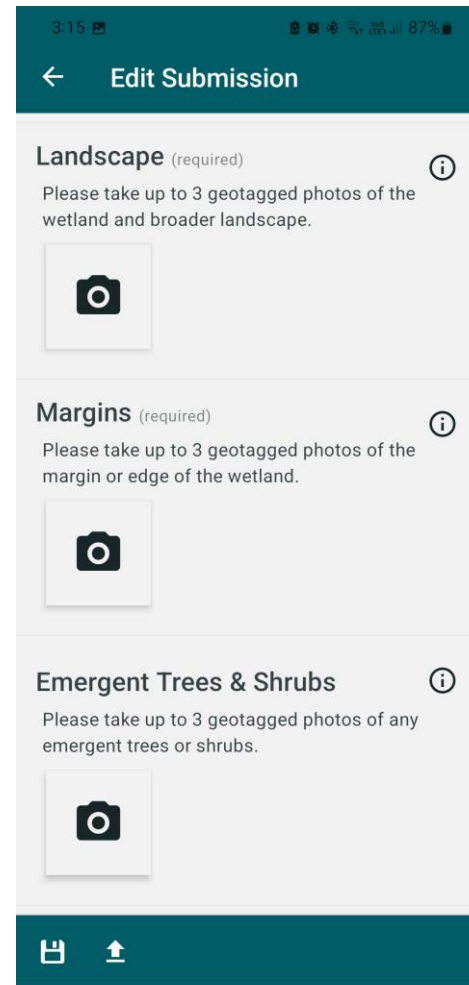
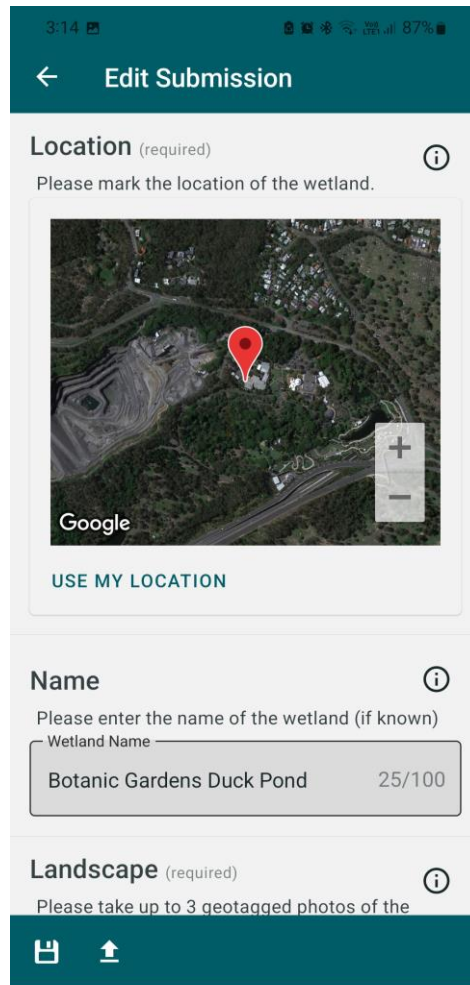
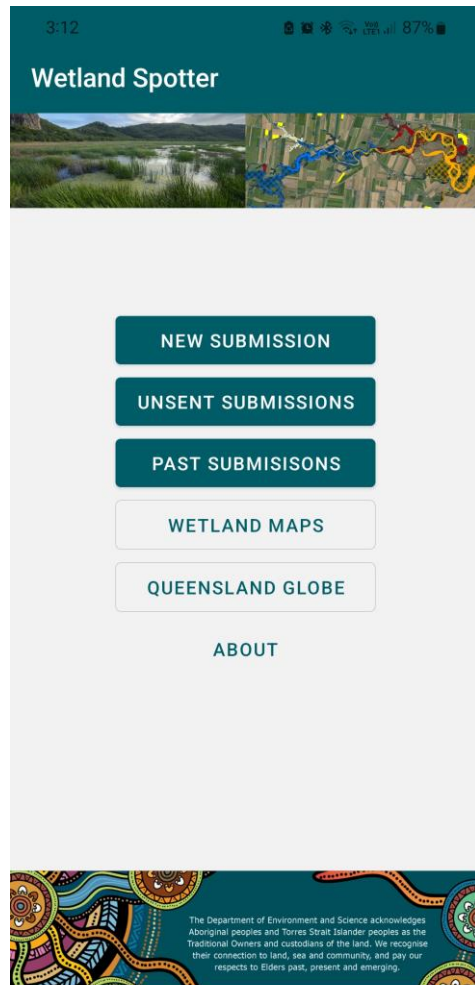


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Wetland Spotter App

Easy to use information capture app to improve wetland mapping and attribution, and provide wetland classification and management advice in return to the submitter



Links

Statewide Landcover and Trees Study <https://www.qld.gov.au/environment/land/management/mapping/statewide-monitoring/slats>

Regional Ecosystems

- <https://www.qld.gov.au/environment/plants-animals/plants/ecosystems>
- <https://qldglobe.information.qld.gov.au/> (Queensland Globe, Biota: Regional ecosystem (RE) mapping)
- Regional ecosystems descriptions database (REDD) [Search regional ecosystem descriptions | Environment, land and water | Queensland Government](#)
- RE Mapping methodology [Methodology for surveying and mapping regional ecosystems and vegetation communities in Queensland - Version 6.0 \(publications.qld.gov.au\)](#)
- RE statistics [Remnant regional ecosystem vegetation in Queensland | Environment, land and water | Queensland Government \(www.qld.gov.au\)](#)
- Land Zones of Queensland [Land Zones of Queensland \(des.qld.gov.au\)](#)
- Technical descriptions [Regional ecosystems technical descriptions - Datasets | Publications | Queensland Government](#)

Wetlands

- <https://wetlandinfo.des.qld.gov.au/wetlands/>
- <https://qldglobe.information.qld.gov.au/> (Queensland Globe, Biota: Queensland wetlands mapping)

Groundwater Dependent Ecosystems

- <https://qldglobe.information.qld.gov.au/> (Queensland Globe, Biota: Groundwater dependent ecosystems (GDE))
- [Groundwater dependent ecosystem mapping background \(Department of Environment and Science\) \(des.qld.gov.au\)](#)

Biodiversity Assessments

- <https://www.qld.gov.au/environment/plants-animals/biodiversity/planning>
- <https://qldglobe.information.qld.gov.au/> (Queensland Globe, Biota: Biodiversity planning assessments)
- <https://qldglobe.information.qld.gov.au/> (Queensland Globe, Biota: Aquatic conservation assessments – riverine, Aquatic conservation assessments – non-riverine)

BioCondition

- <https://www.qld.gov.au/environment/plants-animals/biodiversity/biocondition>

Download Data Products

- <https://qldspatial.information.qld.gov.au/catalogue/custom/index.page>
- <https://www.data.qld.gov.au/>

Online environmental reports [Environmental reports online | Environment, land and water | Queensland Government \(www.qld.gov.au\)](#)