Review of Coastal Wetland and Littoral Rainforest Mapping within Byron Shire LGA
June 2023

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BYRON SHIRE COUNCIL

Version	Written by	Date	Reviewed by	Date
V1	Jane Wickers	June 26 2023	O. Seccull, Byron Shire Council	July 2023
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Note: The information in this plan is subject to clarification or amendment due to changes in legislation, agencies and organisations over time. It is the responsibility of the user to ensure compliance with relevant legislation.

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Acknowledgement

The People of the Bundjalung nation developed and maintained a deep and rich connection with the land of the Byron area. The land nourished all of the person, supplying physical, spiritual, cultural and identity necessities. We wish to acknowledge these First Peoples, and pay our respects to Elders - past, present and future.

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Executive Summary

Byron Shire Council (Council) is preparing Coastal Management Programs (CMPs) for the coastal zone of the Shire under the NSW Coastal Management Framework which includes the *Coastal Management Act 2016* and the *State Environmental Planning Policy (Resilience and Hazards) 2021* (R&H SEPP).

One of the legislated coastal management areas that makes up the coastal zone, as defined in the *Coastal Management Act 2016*, is the 'coastal wetlands and littoral rainforests area'. This is defined as land which displays *'the hydrological and floristic characteristics of coastal wetlands or littoral rainforests and land adjoining those features*' (DPE, 2018).

The aim of the Coastal Management component of the R&H SEPP is:

to promote an integrated and coordinated approach to land use planning in the coastal zone in a manner consistent with the objects of the Coastal Management Act 2016, including the management objectives for each coastal management area, by—

(a) managing development in the coastal zone and protecting the environmental assets of the coast, and

(b) establishing a framework for land use planning to guide decision-making in the coastal zone, and

(c) mapping the 4 coastal management areas that comprise the NSW coastal zone for the purpose of the definitions in the Coastal Management Act 2016.

Ensuring that the locations of the coastal wetlands and littoral rainforests are correctly mapped under the R&H SEPP will help to protect them in their natural state, including their biological diversity and ecosystem integrity.

The focus of this CMP Stage 2 project is to review the existing mapping of coastal wetland and littoral rainforest areas in the Byron Shire coastal zone and identify potential amendments to the mapping including unmapped areas that meet the criteria for littoral rainforest and coastal wetland mapping, and errors in the existing mapping that impact on Council's operational activities (e.g., STP treatment pond). In undertaking this review, it became apparent that the project needed to include a review and update of the criteria for defining coastal wetland and littoral rainforest in Byron Shire with more detailed criteria for defining these communities in the R&H SEPP mapping (refer to Appendix D).

A comprehensive review of coastal wetland and littoral rainforest mapping in Byron Shire was undertaken using the most recent vegetation and High Environmental Value (HEV) mapping as well as NearMaps aerial photography. Information of remnant patch size, connectivity, condition, elevation, vegetation community were used to determine which areas of vegetation met the updated criteria for the R&H SEPP.

The consultation and engagement process on this project involved engaging with Council staff, State Government and advisory bodies.

The technical mapping analysis has identified an additional 265.7 hectares of coastal wetlands and 232.3 hectares of littoral rainforest in Byron Shire that meet the updated criteria to be included in the R&H SEPP. Recommendations as to the future planning proposals and other considerations for Stage 3 and 5 of CMP preparation are also provided.

1. Objective

The review of coastal wetland (CW) and littoral rainforest (LR) mapping in Byron Shire is aimed at ensuring the protection of key ecological communities from future land use pressures and development.

The focus of the project is:

- review the existing mapping in comparison to current vegetation mapping and in consideration of key stakeholder input.
- identify new areas that meet the criteria for LR and CW (refer to Appendix D) via desktop review. In undertaking this step it became apparent that it was necessary to also review and update the criteria for defining coastal wetland and littoral rainforest in Byron Shire with more detailed criteria for defining these communities in the R&H SEPP mapping (refer to Appendix D).
- identify significant errors in the existing mapping or errors that impact on Council's operational activities (e.g., STP treatment pond) via desktop review.
- make recommendations as to Council's future planning activities and other considerations for Stages 3 or 5 of the CMP process.

The objective of the mapping component of the study is to develop spatial datasets as based on the updated mapping criteria for LR and CW to support any future amendment to the R&H SEPP mapping.

2. Scope

The project study area covers the entirety of the coastal zone of the Byron Shire mapped as "Coastal Management Areas" in the R&H SEPP.

All tenures have been included in the review, including National Park estate. It should be noted however that Byron Shire vegetation mapping and High Environmental Value (HEV) mapping excludes National Park estate and Crown Land (other than Crown Land managed by Council).

Private landowners requesting a review of existing mapping will be considered separately as part of the State Government's landowner initiated mapping review process.

3. Background

Byron Shire Council (Council) is progressing the development of Coastal Management Programs (CMPs) for the coastal zone of the Shire under the NSW Coastal Management Framework which currently comprises the:

- *Coastal Management Act 2016*;
- *State Environmental Planning Policy (Resilience and Hazards) 2021* (R&H SEPP) (which includes a mapped coastal wetlands and littoral rainforests area);
- NSW Coastal Management Manual;
- NSW Coastal Council; and
- Coastal and Estuary Grants Program.

A Stage 1 CMP Scoping Study adopted by Council 5th August 2021 (Res 21-299) recommended several studies and activities to address priority information gaps to be carried out in Stage 2 of CMP development including a study to "Investigate and ground truth discrepancies between Council's mapping of littoral rainforest (LR) and coastal wetlands (CW) within the CM SEPP [now the R&H SEPP] mapping…"

Council recently adopted a Biodiversity Conservation Strategy 2020-2030 (BSC, 2020). An action in the Strategy also specified that elements of the strategy relating to CW and LR are to be incorporated into Council's CMP planning process.

Outcomes of the 2023 High Environmental Value (HEV) and 2023 vegetation mapping review indicated that significant areas of LR and CW have not been incorporated into the R&H SEPP mapping.

This project aligns with:

- Several objects of the *Coastal Management Act 2016* including "To facilitate ecologically sustainable development in the coastal zone and promote sustainable land use planning decision-making".
- Management objectives specific to the mapped coastal wetland and littoral rainforest area under that Act as follows:
    a) to protect coastal wetlands and littoral rainforests in their natural state, including their biological diversity and ecosystem integrity,
    b) to promote the rehabilitation and restoration of degraded coastal wetlands and littoral rainforests,
    c) to improve the resilience of coastal wetlands and littoral rainforests to the impacts of climate change, including opportunities for migration,
    d) to support the social and cultural values of coastal wetlands and littoral rainforests,
    e) to promote the objectives of State policies and programs for wetlands or littoral rainforest management.

Council is empowered to seek amendments to the R&H SEPP mapping to meet these objectives either as an outcome of the CMP or separately to the CMP process. This is undertaken through the preparation of a planning proposal to the State Government or could also be undertaken directly by the State Government.

4. History of CW and LR SEPP Mapping

A State Environmental Planning Policy (SEPP) is a policy prepared under the NSW *Environmental Planning and Assessment Act 1979* dealing with matters of significance for environmental planning for the whole state.

Appendix D details the history of CW and LR SEPP mapping in Byron Shire. The key dates in the mapping are outlined below.

- CW mapping published 1985 by the State Government (informed State Environmental Planning Policy No 14—Coastal Wetlands 1985).
- LR mapping published 1986 by the State Government (informed State Environmental Planning Policy No. 26 - Littoral Rainforest 1986).

- State-wide CW and LR mapping updated in 2012 based on University of NSW wetland mapping.
- 2016: Introduction of the NSW Coastal Management Framework and consolidation of SEPP 14 – CW and SEPP 26 - LR into CW and LR mapping for *State Environmental Planning Policy (Coastal Management) 2018* (Coastal Management SEPP).
- 2017: local councils submitted feedback on mapping for State Environmental Planning Policy (Coastal Management) 2018 (incorporating mapping from the repealed SEPP No 14 and SEPP No 26).
- 2018: Byron Shire Council made recommendations to DPE to amend the mapping. This submission included 29 sites which were a mix of Council's operational land, private properties and commercial land.
- 2022: Consolidation of *State Environmental Planning Policy (Coastal Management) 2018* and other SEPPs into the Resilience and Hazards SEPP 2021.
- 2018 – 2023: Landowner led requests to the State Government to make minor amendments to CW and LR mapping on a case-by-case basis.

State Environmental Planning Policy (*Resilience and Hazards*) 2021 (available at https://legislation.nsw.gov.au/view/html/inforce/current/epi-2021-0730) aims to promote an integrated and coordinated approach to land use planning in the coastal zone in a manner consistent with the objects of the *Coastal Management Act 2016*, including the management objectives for each coastal management area, by—

(a) managing development in the coastal zone and protecting the environmental assets of the coast, and

(b) establishing a framework for land use planning to guide decision-making in the coastal zone, and

(c) mapping the 4 coastal management areas that comprise the NSW coastal zone for the purpose of the definitions in the *Coastal Management Act 2016*.

The coastal wetlands and littoral rainforests area is the land identified by the Coastal Wetlands and Littoral Rainforests Area Map in the legislation.

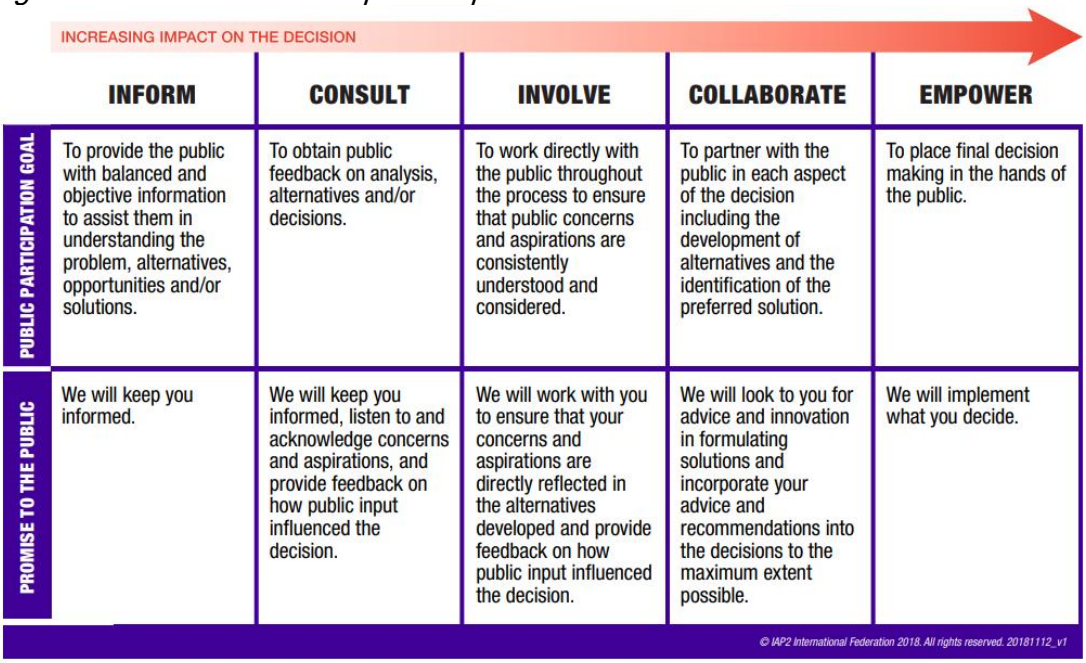
5. Stakeholder and community engagement

The objective of CMP Stage 2 is to undertake "detailed studies that help councils to identify, analyse and evaluate risks, vulnerabilities and opportunities (DPE, 2019), i.e., to empower Council with knowledge to contribute to informed decision making in Stage 3 and to share information equitably among stakeholders.

A stakeholder and community engagement plan was developed for this project based on that developed for the Scoping Study for the Byron Shire Southern Coastline and Belongil Estuary (Rhelm, 2021).

The principles for the engagement strategy include the Association for Public Participation (IAP2) approach to engagement and specifically the IAP2 public participation spectrum (Figure 1) as well as Council's Principles for Engagement from the Policy.

Figure 1 - IAP2 Public Participation Spectrum



INCREASING IMPACT ON THE DECISION

	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PUBLIC PARTICIPATION GOAL	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision making in the hands of the public.
PROMISE TO THE PUBLIC	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.

Appendix A details the Stage 2 Stakeholder and Community Engagement Plan for this project.

Community engagement activities in Stage 2 are at the 'consult' or 'involve' levels in the International Association for Public Participation IAP2 spectrum.

6. Methodology

6.1 Review of Council data and SEPP History

The following documents were reviewed to inform the process for updating CW and LR mapping in Byron Shire:

- The outcomes of Actions 1.14 and 1.19 of Biodiversity Conservation Strategy 2020-2030 (BSC, 2020).
- Stage 1 CMP Scoping Study for the Byron Shire Southern Coastline and the Belongil Estuary (Rhelm, 2021) adopted by Council 5th August 2021 (Res 21-299).
- Previous submissions by Council to DPE regarding SEPP mapping.
- Council's 2023 HEV and vegetation mapping.
- NSW Government (2018b) Coastal Management SEPP Factsheet 4: Mapping of Coastal management Areas (Technical). Available at: Coastal Management SEPP - Fact sheet 4: Mapping of Coastal Management Areas (Technical) (nsw.gov.au).

For a complete list of documents that were reviewed, refer to the References section.

6.2 Consultation with stakeholders

Appendix A identifies the IAP2 public participation spectrum applied to the CW and LR mapping review in Byron Shire.

The process involved liaising with key stakeholders including:

- Byron Shire Council Staff from Coastal and Biodiversity, Land Use Planning and Sustainable Development, Open Spaces, and Utilities teams.
- Staff from the Department of Planning and Environment's (DPE) Planning and Assessment Group (PAG) on the status and any outcomes of the SEPP mapping review and the status of any guidance for mapping criteria.
- Staff from DPE's Biodiversity Conservation Division, the National Parks and Wildlife Service (NPWS), DPE's Crown Lands Division, and the Department of Primary Industries – NSW Fisheries.
- Members of Council's Coast and ICOLL Advisory Committee and the Biodiversity Advisory Committee.

A set of targeted questions were emailed to key advisory bodies (see Appendix B). Two responses were received from the targeted survey questions sent to advisory body members (refer to Appendix C).

6.3 Mapping Review

6.3.1 Desktop Mapping Exercise

Through the literature and dataset review undertaken (refer Appendix D for more detail) it is understood that the datasets used to define CW and LR mapping in the existing R&H SEPP were based on desktop mapping exercises with limited if any ground-truthing, at least until the reviews undertaken in 2017 and 2018.

It is also important to note that the mapping review herein by Earthscapes was undertaken entirely as a desktop exercise. No ground-truthing was completed as part of this project. However, a significant portion of vegetation mapping datasets used in this review were ground-truthed as part of their creation (as identified in Appendices E and F) and these datasets are best available and likely more accurate than the existing R&H SEPP mapping of CW and LR areas.

DPE as the project partner with Council for preparation of CMPs has been consulted with closely on this project providing data, feedback and review of deliverables for this project. DPE has indicated that all R&H SEPP mapping amendments should be ground-truthed and it is understood that this is a stance being taken for other SEPP maps such as for the review of C-zones. Recommendations are provided in Section 9 as to ground-truthing regarding any future planning proposal for the R& H SEPP.

6.3.2 Changes to Existing SEPP Mapping

Council staff identified errors in the existing CW and LR mapping (R&H SEPP) that impact Council's operational activities. Examples of these activities are mapping over roadways or in Sewerage Treatment Works (STPs) operational areas.

These sites were verified using recent 2023 Nearmaps aerial photography and an ArcGIS shapefile created to record the proposed changes. The spatial data includes an attribute table containing source data and justification for amendments.

6.3.3 Additions to SEPP Mapping

A review of the criteria used by the State Government to map CW and LR (R&H SEPP) was undertaken (see methodology provided in Appendix D).

The DPE 2018 Fact Sheet 4: Mapping of Coastal Management Areas (Technical) defined SEPP 14 coastal wetland mapping as dominated by the following vegetation types:

- Mangroves
- Saltmarshes
- Melaleuca forests
- Casuarina forests
- Sedgelands
- Brackish and freshwater swamps
- Wet meadows.

Fact Sheet 4 defined SEPP 26 littoral rainforests on their dominant vegetation. The main tree species must include:

- Riberry, broad-leaved lilly pilly
- Tuckeroo
- Brush box
- Yellow tulip, bauerella, red olive plum, plum pine
- Lilly pilly, various figs, cabbage palm and plum pine.

These broad vegetation communities outlined in Fact Sheet 4 (DPE, 2018) are suitable and hence retained in the updated criteria for mapping CW and LR. Appendix D Tables 2 and 3 outline the more detailed criteria that was developed through this project proposed to identify suitable vegetation communities to be added to the mapping.

A minimum patch area of 5,000 sqm was chosen for the following reasons:

- This area is consistent with the scale of Council's most recent (2023) vegetation mapping.
- This area is consistent with the minimum area used to generate environmental zones in Byron Shire.

Where a small patch is in close proximity (within 100 m) to another patch, it is considered to be part of a larger connected patch.

It is understood that the DPE-Coastal Policy team are considering adoption of a minimum patch size of 400 sqm. When this methodology is finalised by the Department, patches < 5,000 sqm may be considered.

The following datasets were used to map areas that meet the updated criteria but are not included in the R&H SEPP mapping:

- Aerial photography; April - June 2023 NearMaps.
- Byron Shire (excluding National Park Estate) – Council's 2023 Vegetation mapping. This mapping is current and of a higher accuracy than the State Government NSW Plant Community Types (PCT) mapping. It also includes information about vegetation condition and canopy.
- Vegetation mapping in Byron Shire within National Park Estate:
  - *Cape Byron Arakwal Vegetation mapping 2013*
  - *Tyagarah Nature Reserve vegetation mapping 2016*

- *Billinudgel Nature Reserve vegetation mapping 1998*
- *NSW State Vegetation Type Mapping (SVTM) June 2022 mapping*

The first iteration of the updated mapping was reviewed using NearMaps aerial photography (currency between April and June 2023) and validated by an Earthscapes Senior Ecologist.

NPWS staff reviewed the proposed LR and CW additions in National Park Estate. Council staff were also given the opportunity to provide feedback on the draft mapping.

An ArcGIS shapefile was created to record the proposed changes. The spatial data includes an attribute table containing source data and justification for amendments.

7. Results

7.1 Proposed Areas to be removed from current SEPP mapping

The results of the review include proposed excisions of CW mapping of the R&H SEPP 2021 in the Byron Shire local government area.

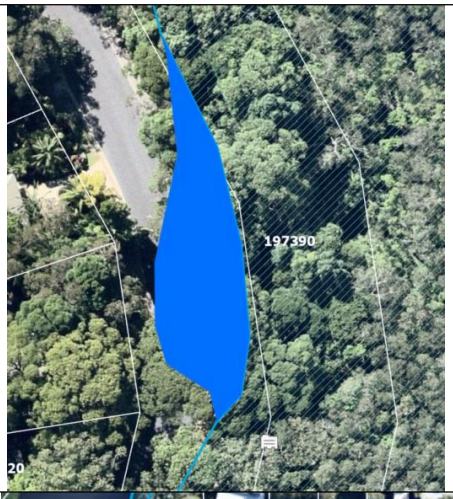
No areas are proposed to be removed from the current LR mapping.

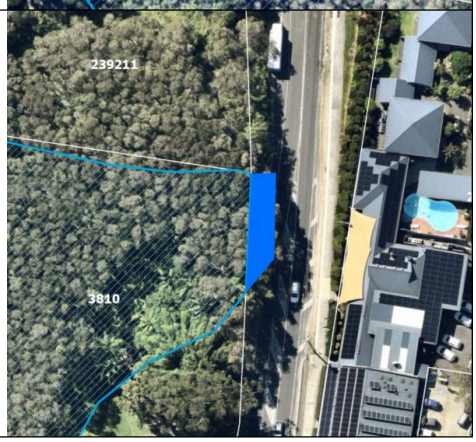
Fourteen sites totaling 77, 252 sqm (7.73 ha) are proposed to be removed from the current coastal wetlands mapping (see Table 1). These are sites that impact Council's operational activities and are based on feedback from Council staff.

Table 1 – Proposed areas to be removed (dark blue polygons) from coastal wetlands mapping in Resilience and Hazards SEPP 2021.

Property Details	Reasons for Removal from Mapping	Map
Parcel Numbers: 111700, 267478 Address: 1 Broken Head Rd, Byron Bay and 2 Alcorn St, Suffolk Park	CW mapping over footpath and bridge at Tallow Creek	
Parcel Numbers: 7610, 268546 Address: Butler St, Byron Bay	Byron bypass. Vegetation no longer exists.	

Parcel Numbers: 182770, 182820, 182830 Address: Ewingsdale Rd, Byron Bay	Belongil Bridge and Council drain (major town drain) running SE.	
Parcel Number: 49360 Address: 1199 Main Arm Rd, Upper Main Arm	CW mapping on disturbed vegetation, area < 5,000 sqm and > 14 km from coast. Does not meet criteria for CW.	
Parcel Number: 60550 Address: Bangalow Rd, Byron Bay	CW mapped over Council drain and disturbed vegetation.	
Parcel Numbers: 268567, 270217, 270230 Address: Bayshore Drive, Byron Bay	CW mapping on rail corridor (State Government operational land).	
Parcel Number: 115820, 268883 and road reserve. Address: New Brighton Rd, Ocean Shores.	CW mapping on road.	

Parcel Number 197390 + road reserve. Address: Lilli Pilli Dr, Byron Bay	CW mapping on road.	
Parcel Numbers: 221480, 234530, 115830 Address: Redgate Rd, South Golden Beach	CW mapping on road and within Council drain and drainage detention basin.	
Strand Avenue road reserve, New Brighton.	CW mapping on road.	
North Head Rd, New Brighton	CW mapping on road.	

Parcel Number: 94860 Address: 45 Wallum Pl, Byron Bay	Byron Sewerage Treatment Plant - Treatment pond requiring active vegetation management as part of consent conditions.	
Parcel Number: 94240 Address: 44 Ti Tree Rd Byron Bay reserve.	Feedback from Environmental Zone review. CW mapping over driveway, garden and road. Verified via site visit by Senior Ecologist 2021.	
Bangalow Rd, Suffolk Park	CW mapping on road.	

7.2 Proposed Areas to be added to the current SEPP mapping

The results of the review include proposed additions of CW and LR mapping of the R&H SEPP in the Byron Shire local government area. These areas meet the updated criteria detailed in Appendix D.

In total, 150 sites are proposed to be added to the CW mapping, totaling 265.7 hectares. Appendix F details the sites and Figure 2 displays the location of each site. A breakdown of vegetation community types and the area of each new proposed addition is provided in Table 2.

Table 2 - Proposed additions to coastal wetland mapping by Vegetation Community

Vegetation Community	Area (ha)
Mangrove Swamp	6.4
Saltmarshes	0
Coastal Swamp Forests	247.1
Coastal Floodplain Forest	0.3
Coastal Heath Swamps	5.8
Coastal Freshwater Lagoon	6.3
Wet Meadows	0
	265.7

The littoral rainforest mapping review was found to have an additional 90 sites proposed to be added, totaling 232.3 hectares. Appendix E details the sites and Figure 3 displays the location of each site.

Table 3 summarises the area of proposed additions and reductions to the current coastal wetland and littoral rainforest mapping in the R&H SEPP.

Table 3 - Summary of proposed amendments to coastal wetland and littoral rainforest mapping

	Resilience and Hazards SEPP 2021 current mapping (ha)	Proposed Reductions (ha)	Proposed Additions (ha)	Percentage (%) of Proposed Net Increase	Area of Advanced Regrowth not included (ha) [1]
Coastal wetlands	1,573	7.7	265.7	16.4	84.3
Littoral rainforests	99.7	0	232.3	233	256.8

[1] Does not include National Park Estate as insufficient data about condition in vegetation mapping.

Figure 2 - Map of proposed coastal wetland amendments.

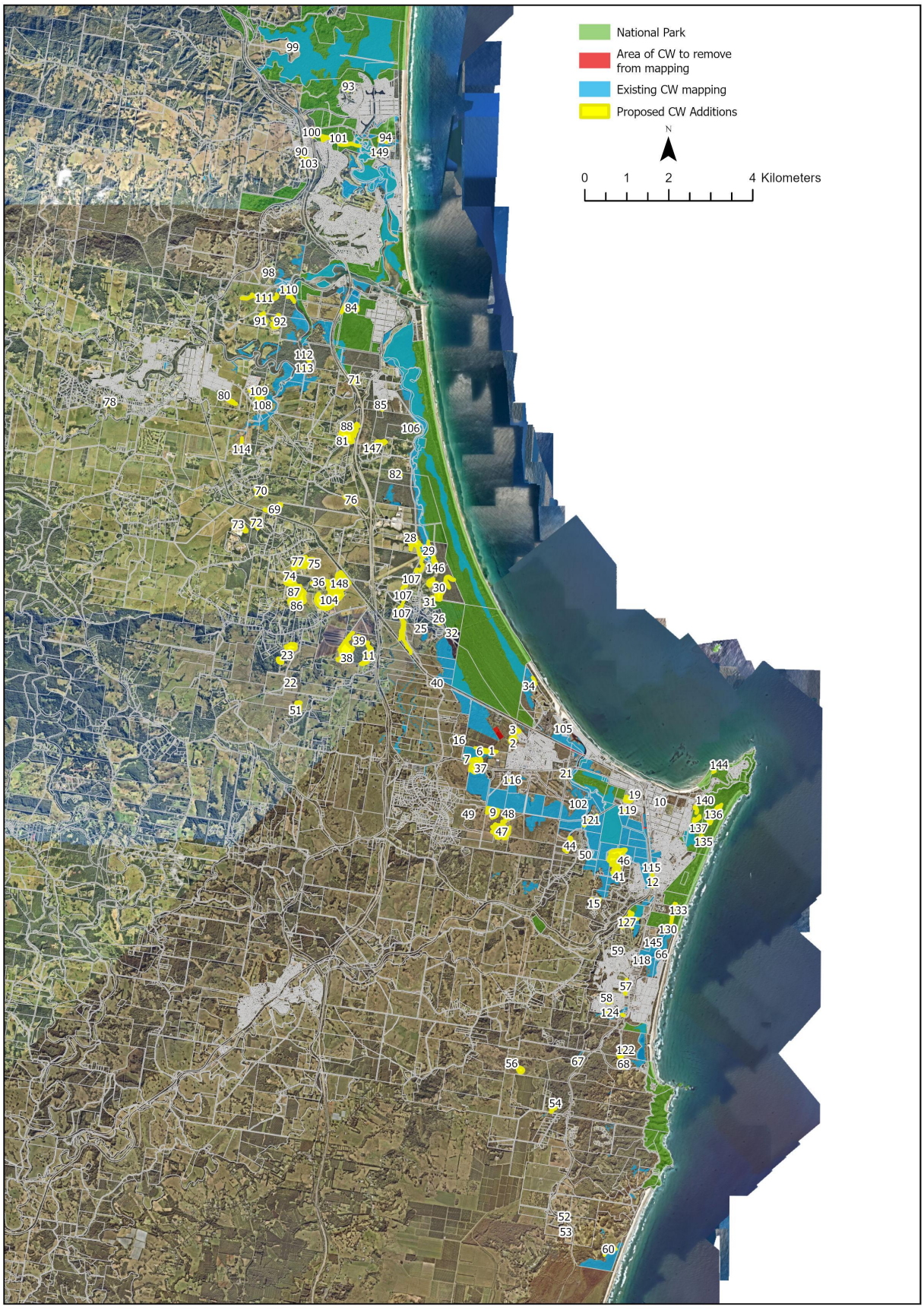


Figure 3 - Map of proposed Littoral Rainforest amendments.

7.3 Priority Restoration Areas

Potential restoration sites are those that do not currently meet the updated mapping criteria but are likely to meet the criteria if restoration works are undertaken.

High priority CW and LR restoration areas are sites where:

- The condition of the vegetation is regrowth or advanced regrowth.
- The site is degraded as a result of disturbance.
- Restoration would provide vegetation linkages across cleared or partially cleared landscapes.
- Planting riparian sites will improve the water quality of the water system.
- Sites are in fragmented landscapes and would benefit from additional vegetation.

During discussions with key stakeholders, a number of areas were identified as examples of suitable areas for restoration of coastal wetlands or littoral rainforest (see Table 4).

More detailed analysis of high priority restoration sites can be undertaken at Stage 3 of the CMP preparation.

Table 4 provides examples of coastal wetland and littoral rainforest priority restoration areas in Byron Shire.

Table 4 - Examples of CW and LR Priority Restoration Areas

Description of Site	Map
Riparian areas in agricultural areas (e.g., cleared areas adjacent to Brunswick River at Mullumbimby).	

Regrowth littoral rainforest, South Golden Beach.	
Advanced regrowth Paperbark forest at Foxes Lane Tyagarah.	

7.4 Blue Carbon Sites

Blue carbon is the carbon captured and stored in coastal and marine ecosystems, including seagrass meadows, saltmarshes, mangroves and supratidal forests. The NSW Blue Carbon Strategy 2022 - 2027 (DPE, 2022) details the priorities for delivering blue carbon projects.

Table 5 provides examples of potential blue carbon restoration sites within the coastal zone of Byron Shire. Note, this is not a comprehensive assessment of blue carbon sites, rather a first pass subjective assessment undertaken as a variation to the main objectives of this study.

Table 5 – Examples of Potential Blue Carbon Sites

Site Location	Blue Carbon Information	Map
PN 239431. Address: Harbour Way, Brunswick Heads National Park Existing CW mapping	Infrastructure is currently impeding the tidal flow to the coastal wetlands south of this site.	

8. Discussion

Coastal wetlands and littoral rainforests in Byron Shire face ongoing threats, including sediment nutrient inputs, Myrtle Rust, coastal and estuarine erosion, hydrology changes, climate change, landuse changes and development. Vegetation communities may also change their floristic characteristics over time.

These changes, together with evidence that SEPP maps are out-of-date or incorrect (DPE, 2019) highlight the need for a review of the existing *Resilience and Hazards SEPP 2021* mapping.

Concerns over omissions of key littoral rainforest remnants were noted by Council in their submission on the *Draft State Environmental Planning Policy (SEPP) (Coastal Management) 2017*:

"The area covered by the Departments littoral rainforest mapping is only a fraction of Byron Shire Council's mapped littoral rainforest under our 2015 vegetation mapping review. This is particularly the case for Broken Head, but also includes important areas at Belongil and Byron foreshores, Suffolk Park, Brunswick and Ocean Shores. Given the changes to the Biodiversity Conservation Bill, significant areas of littoral rainforest not mapped would appear to be able to be assessed for clearing with little protection. The most significant of these is the area around Broken Head, adjacent Broken Head Nature Reserve, and representing remnant native vegetation."

A local environmental organisation also noted that the SEPP mapping was missing extensive areas of littoral rainforest and coastal wetlands in their 2017 zoning submission to the NSW Coastal Management Reforms.

Table 3 shows that 265.9 ha of coastal wetlands and 238.2 ha of littoral rainforest are unmapped and should be considered in any future amendments to the R&H SEPP mapping.

The key reasons these areas are not already included in the *Resilience and Hazards SEPP 2021* mapping are:

- More accurate, current and finer scale vegetation mapping of Byron Shire is now available.
- High resolution aerial photography such as NearMaps allows more accurate mapping of vegetation boundaries.
- On the ground National Park staff have not previously been consulted by State Government (or Council) to the mapping process.
- Terrestrial *Melaleuca* forests were not included in the original SEPP mapping undertaken by Adam *et al.* (1985). Refer to Appendix D for more detailed information.
- Vegetation communities previously mapped as regrowth may now be classified as mature forest.
- Previous recommendations from Byron Shire Council (such as the submission on the draft 2017 mapping) were not included by the State Government in the current version of the R&H SEPP maps.

This assessment is based on the best available data and expert knowledge, however ground-truthing of some sites will still be required.

As noted in the project scope, some existing LR and CW mapped areas may not be accurate because of incorrect mapping or encroachment resulting from residential development (for example Wategos Beach, Byron Bay). These sites may be addressed by the State Government in a separate landowner led review process.

This project has been prepared by Earthscapes for Byron Shire Council and aligns with several objects of the *Coastal Management Act 2016* including "To facilitate ecologically sustainable development in the coastal zone and promote sustainable land use planning decision-making".

Ensuring that the locations of the coastal wetlands and littoral rainforests are correctly mapped under the R&H SEPP will help to protect them in their natural state, including their biological diversity and ecosystem integrity.

9. Recommendations

The following recommendations follow the review of the current Byron Shire coastal wetland and littoral rainforest mapping in the *Resilience and Hazards SEPP 2021:*

- The proposed excision of areas impacting Council's operational activities be sent to DPE for review and update of R&H SEPP 2021 mapping.
- The proposed additions to CW and LR mapping be included in a Planning Proposal at a later stage of the CMP process, prior to which:
  - Further discussion with Council's Infrastructure Services Directorate take place regarding sites 115, 12, 58, 10, 19, 20 and 119 before the mapping progresses to a Planning Proposal
  - Council verifies sites that have not been ground-truthed during the mapping of vegetation communities.
  - Council considers any updated guidance on mapping as provided by the State, for example, once the DPE-Coastal Policy team have finalised the updated minimum

patch size in the SEPP methodology, Council review areas that differ from the current minimum patch size criteria used for this assessment

- No changes be made to Council's Local Environment Plan (LEP). Areas of high ecological value, including coastal wetlands and littoral rainforest have already been incorporated into Council's LEP as part of the Conservation Zone review.
- Council's HEV mapping be updated with any changes to the R&H SEPP 2021 mapping.
- Council's vegetation mapping of Endangered Ecological Communities described in Appendix D be updated (with the exception of Swamp Oak which was recently updated by Council). For example, littoral rainforest.
- Council identify and facilitate blue carbon restoration projects at a later stage of the CMP process.
- Vegetation mapping in National Park be updated by NPWS. Whilst SVTM mapping covers these areas, further refinement of the mapping is required.
- Council identify areas to enable CW migration under sea-level rise scenarios at a later stage of the CMP process.
- Council investigate smaller and lower condition patches at a later stage of the CMP process.
- Council continues to review LR and CW mapping as per The Coastal Management SEPP Fact Sheet No. 4 (April 2018): "*The Department of Planning and the Environment [now DPIE] expects that maps of the coastal management areas will be* ***regularly reviewed as improved data and mapping methods become available*** *to councils and the NSW Government*".
- Council investigates areas of CW and LR in the existing SEPP mapping where there appears to be unauthorised clearing/development.
- Council consider how proposed mapping amendments affect management requirements under the Byron Shire Flying Fox Camp Management Plan (2018-2023).
- Council identify priority restoration sites using condition and canopy data within Council's vegetation mapping at a later stage of the CMP process.
- Review sites that are not currently to be included in SEPP mapping changes but meet the ecological criteria e.g., Ocean Shores STP after facility is decommissioned.

10. Data Output

ESRI's Arcgis Pro project file: Byron Shire Council's network location:G:\EPS\NATURAL ENVIRONMENT_Biodiversity\GIS\Veg2022/Veg2022.aprx
G:\EPS\NATURAL ENVIRONMENT_Biodiversity\GIS\\CW and LR 2023 Mapping\CW_LR_Map.aprx

Output datasets:
Additional LR Mapping: G:\EPS\NATURAL ENVIRONMENT_Biodiversity\GIS\CW and LR 2023 Mapping\Data\Final\Proposed_LR_AdditionsMGA56.shp

Additional CW Mapping: G:\EPS\NATURAL ENVIRONMENT_Biodiversity\GIS\CW and LR 2023 Mapping\Data\Final\Proposed_CW_AdditionsMGA56.shp

Projection is GDA 1994 MGA Zone 56

Metadata:
G:\EPS\NATURAL ENVIRONMENT_Biodiversity\GIS\CW and LR 2023 Mapping\Data\Final\CW and LR SEPP 2023 Metadata.doc

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Rhelm (2021) Coastal Management Program Scoping Study (Stage 1) for the Southern Byron Shire Coastline and Belongil Estuary. Available at: Coastal Projects - Byron Shire Council (nsw.gov.au).

Appendix A - Stakeholder and Community Engagement Plan

* Based on Rhelm (2021) Coastal Management Program Scoping Study (Stage 1) for the Southern Byron Shire Coastline and Belongil Estuary Final Scoping Study (Stage 1)

Stakeholder Group	Division/Team	Engagement Methods	Engagement Type	Engagement Level
Government (State and Federal)	Federal and state members of Parliament	-	-	-
Byron Shire Council	Coast and Biodiversity team	- Inception meeting. - Progress report via email. - Progress meetings (online). - Ongoing liaison and collaboration. - Review of project deliverables	Online meetings/Phone/Email	**Consult**
	Open Spaces	- Engagement regarding history of mapping and amendments, expectations (e.g., for operational land), local knowledge etc. - Review of draft report and mapping.	Online meetings/Emails	**Consult**
	Strategic Planning			
	Development Assessment			
	Utilities	- Review of project deliverables	Email	**Consult**
	Project Support	- As required for administration purposes	Email	**Involve**
State Government Agencies	Department of Planning and Environment (DPE) - Water, Floodplains and Coast (North East)	- Ongoing advice/guidance on CMP development - Involve at key decision making points - Review of draft report	Online meetings/Phone/Email	**Involve**
	Department of Planning and Environment (DPE) - Biodiversity and Conservation Division (BCD)			
	Department of Planning and Environment (DPE) - Planning and Assessment Group (PAG)	- Engagement on history of mapping amendments (initial CM SEPP mapping, 2018 amendments and more recent landholder driven amendments/process), guidance for mapping (floristic and hydrological	Online meetings/Phone/Email	**Involve**

		characteristics) - Review of draft report		
	Department of Primary Industries (DPI) - Fisheries - Coastal Systems (North Coast)	- Targeted engagement - Review draft report	Email	**Involve**
	NSW Crown Lands - Coastal Unit Land & Asset Management	- Review of draft report (Council to disseminate draft and collate comments)	Email	**Consult**
	National Parks and Wildlife Services - North Coast/Byron Bay	- Targeted engagement RE any recent mapping by NPWS and local knowledge RE any changes required for NPWS estate. - Review draft report	Online meetings/Phone/Email	**Involve**
	National Parks and Wildlife Services - State representative for CMPs			
Advisory Bodies	Coast and ICOLL Advisory Committee	- Courtesy email to committee members with targeted questions (via Council staff) - Quarterly project updates	Email	**Consult**
	Biodiversity Advisory Committee			
Community Groups (e.g., Save Tallow Creek)		Access to Byron Shire Council's reports and updates, including C&ICOLL Advisory Committee and to Floodplain Advisory Committee minutes	Email	**Inform**
Community Individuals				
Businesses affected				

Appendix B - Targeted Questions sent to Advisory Bodies

Email sent April 6, 2023:

Dear Agency representatives,

We would appreciate your input on the current mapping of Littoral Rainforest (LR) and Coastal wetlands (CW), specifically regarding any discrepancies and opportunities for improvement.

We are currently seeking committee members input only. Therefore, we ask that you keep the content of this email confidential and not share it publicly, as per the "Statutory Policy: Code of Conduct for Council Committee Members, Delegates of Council, and Council Advisers."

Council has hired EarthScapes Consulting Pty Ltd to review the Coastal Wetland and Littoral Rainforest Area mapping in the State Environmental Planning Policy (Resilience and Hazards) 2021. This project is part of Stage 2 of the Coastal Management Program (CMP) for the southern coastline of Byron Shire. The review aligns with several objectives of the CMP, including promoting sustainable land use planning decision-making and facilitating ecologically sustainable development in the coastal zone.

The project will also identify risks and opportunities associated with threats identified in Stage 1, such as physical habitat and wildlife disturbance, and coastal development leading to the loss of plant and animal species.

You can view the SEPP mapping of the LR and CW areas through Byron Shire Council's online mapping tool, and you'll find further information, instructions, and criteria for LR or CW mapping in the attached document.

Please submit your feedback by **Thursday 20 April.**

Project Support | BYRON SHIRE COUNCIL

Review of Littoral Rainforest and Coastal Wetlands mapping

Please identify locations where there are discrepancies in the LR or CW mapping and describe the reason why the mapping should be amended.

Please identify locations where sites have not been included in the mapping but meet the criteria for LR or CW mapping.

Please identify CW or LR locations that would benefit from habitat restoration works?

Please identify locations where CW or LR are under threat and why.

Do you have additional questions or comments regarding the mapping?
Please include attachments to support your feedback if desired.

Appendix C - Responses to Targeted Questions sent to Advisory Bodies

1. Positive Change for Marine Life

Hello,
Many apologies for the delayed response, I would like to submit the following feedback if possible;
I am supportive of a review of the Littoral Rainforest (LR) and Coastal wetlands (CW) mapping. Up to date, higher resolution mapping technology, with strategic ground truthing would significantly improve the accuracy of these maps. PCFML would like to support mapping updates where possible. We are planning to implement citizen science monitoring programs of the wetland ecosystems in the Brunswick River catchment by the end of 2023.
Kind Regards,

WETLANDS AND COASTAL PROGRAMS COORDINATOR

2. Source unknown

The flood mapping relates to 1 in 100 year flooding.
This definition is out of date and should reflect actual possible flooding events. perhaps this could be relabelled. Does this mapping show historical flooding events?
The bushfire overlay is not very helpful. Do the areas indicated in deeper red show higher possibility of bushfires? A key would be helpful. Are areas shown in red more likely to be affected by bushfires the other parts of the shire? Does the bushfire mapping include
rainforest vegetation types?
This mapping could affect homeowners ability to insure their properties if taken into account by risk assessors.

Appendix D - EarthScapes Consulting Proposed Methodology for Mapping Coastal Wetlands (CW) and Littoral Rainforest (LR) in Byron Shire 2023

Authors: Dr Joanne Green and Jane Wickers

Version	Written by	Date	Reviewed by
V1	Jane Wickers and Joanne Green	April 2023	Orla Seccull, Byron Shire Council NSW Department of Planning and Environment
V2	Jane Wickers and Joanne Green	June 2023	Orla Seccull, Byron Shire Council
Final	Jane Wickers and Joanne Green	June 22 2023	

Note: The information in this plan is subject to clarification or amendment due to changes in legislation, agencies and organisations over time. It is the responsibility of the user to ensure compliance with relevant legislation.

This plan has been prepared by EarthScapes Consulting Pty Ltd
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www.earthscapes.com.au

Acknowledgement
The People of the Bundjalung nation developed and maintained a deep and rich connection with the land of the Byron area. The land nourished all of the person, supplying physical, spiritual, cultural and identity necessities. We wish to acknowledge these First Peoples, and pay our respects to Elders - past, present and future.

1. Project Background

A Stage 1 CMP Scoping Study adopted by Byron Shire Council 5th August 2021 (Res 21-299) recommended several studies and activities to address priority information gaps to be carried out in Stage 2 of CMP development including a study to "Investigate and ground truth discrepancies between Council's mapping of Littoral Rainforest and Coastal Wetlands with the CM SEPP mapping…"

The aim of the mapping component of the study was to develop spatial datasets as supporting documentation to propose a future amendment to the Coastal Management SEPP.

EarthScapes consulting has been engaged by Byron Shire Council to review the coastal wetland (CW) and littoral rainforest (LR) mapping. The project study area covers the entirety of the coastal zone of the Byron Shire mapped as "Coastal Management Areas" in the State Environmental Planning Policy (Resilience and Hazards) 2021.

The review is aimed at improving protection of these areas and therefore focuses on adding new areas as opposed to reducing or removing existing mapped areas unless there is a clear reason (for example, an error in mapping such as mapped farm dam, or STP treatment pond etc.).

2. History of CW and LR Mapping in Byron Shire

- CW mapping published 1985 by the State Government (informed *State Environmental Planning Policy No 14–Coastal Wetlands* (1985). This mapping covered all CW in NSW.

  Adam *et al.* (1985) (in Winning, 1991):

  Areas dominated by the following vegetation types:

  - *Mangroves*
  - *Saltmarshes*
  - *Melaleuca forests*
  - *Casuarina forests*
  - *Sedgelands*
  - *Brackish and freshwater swamps*
  - *Wet meadows.*

  Areas excluded from the mapping:

  - *Disturbed or Modified Wetlands*
    - *Presence of functional drains.*
    - *Presence of fence lines*
    - *Paddock differentiation.*
    - *Signs of reclamation, extensive clearing or contraction of permanently inundated areas.*

- ✧ *Lack of a natural boundary with bushland, estuary or large wetland.*

- ➢ *Dune thickets - tall closed shrubs of teatree (Leptospermum spp) which occur on sand dunes.*
- ➢ *Submerged communities, including seagrasses.*
- ➢ *Wet heath - not included as rarely associated with bodies of standing water.*
- ➢ *Terrestrial Melaleuca forests - occur on floodplains or on poorly drained soils on slopes which may be temporarily inundated with water during periods of heavy rain or flood, but from which the surface water quickly drains away.*
- ➢ *Melaleuca forests where canopy comprised > 10% Eucalyptus species.*
- ➢ *Terrestrial Casuarina forests - occur on floodplains or on poorly drained soils on slopes which may be temporarily inundated with water during periods of heavy rain or flood, but from which the surface water quickly drains away.*

Adam (1992) notes the mapping was based on the most recent aerial photography at that time of mapping (date unknown, assume ~1985) with no ground truthing.

- LR mapping published 1986 by the State Government (informed *State Environmental Planning Policy no. 26 – Littoral Rainforest 1986*). Historic criteria were obtained from SEPP 26 (LR) metadata (https://datasets.seed.nsw.gov.au/dataset/93046ab0-0dd4-4ba3-8cfe-89a42f2d42db/metaexport/html):

  The littoral rainforest stands were identified by the NSW National Parks and Wildlife Service from LIC colour 1:25,000 aerial photography taken in 1986, confirmed by field checking and transferred manually onto LIC 1:25,000 topographic map series. The compiled maps were hand digitised using GenaMap GIS software. The positional accuracy of the stand boundaries was considered to be around 25 meters on 1:25,000 maps. The boundaries on these maps were defined by the outside edge of the thick black lines which delineate the stand areas. The outer edge was followed in the digital version.

  The littoral rainforest delineation was based on their vegetation features as botanical indicators, the criteria for interpretation also included size, shape, species, canopy, integrity, rare species and viability.

- State-wide CW and LR mapping updated by the State Government in 2012 based on University of NSW wetland mapping (Locale Consulting, 2021).

- 2016: Introduction of the NSW Coastal Management Framework and consolidation of SEPP 14 – CW and SEPP 26 - LR into CW and LR mapping for S*tate Environmental Planning Policy (Coastal Management) 2018* (Coastal Management SEPP).

- 2017: State Government led review of *State Environmental Planning Policy (Coastal Management) 2018* (Coastal Management SEPP). Mapping of mangrove and saltmarsh communities by DPI Fisheries (Crease *et al*. 2009) included. Local councils submitted feedback. Council's submission included 29 sites which were a mix of Council's operational land, private properties and commercial land.

- 2018: Byron Shire Council made recommendations to DPE to amend the mapping based on the 2017 High Environmental Value (HEV) vegetation mapping, primarily to:
  - include new areas of LR based on the findings of the 2017 HEV mapping.
  - align CW or LR with requirements to manage Council operational land and in certain drains, on roads, road reserves or with other infrastructure.

- 2022: Consolidation of *State Environmental Planning Policy (Coastal Management) 2018* and other SEPPs into *Resilience and Hazards SEPP 2021.*

- 2018 – 2023: Land-owner led request to make minor amendments to CW and LR mapping on a case by case basis (direct between land-owner and DPE).

3. Discussion on CW and LR Criteria - revision

The original CW and LR mapping (i.e., in SEPP 14 and SEPP 26) was prepared using the most current aerial photography at that time (although the exact date of the photogrammetry is unknown). Adam (1992) notes that the mapping was prepared rapidly to meet the policy requirements and did not include ground-truthing.

There are some questions around the exclusion of Disturbed or Modified Wetlands, the criteria listed for exclusion are provided in Table A with comments.

Table A: Discussion on Adam *et. al* (1985) criteria for disturbed or modified wetlands excluded from SEPP 14 mapping.

Criteria	*Discussion*
Presence of functional drains	This is variable and hard to determine what is or isn't functional depending on age and usage
Presence of fence lines	Not a criterion on its own and needs ground checking as some areas of important wetlands are regularly grazed.
Paddock differentiation	Not a clear boundary criterion.
Signs of reclamation, extensive clearing, or contraction of permanently inundated areas	This parameter could be variable due to drought. Where possible, the maximum extent (during a wet period) should be included in the mapping.
Lack of a natural boundary with bushland, estuary, or large wetland	A variable boundary.

Since the original mapping, the resolution and currency of aerial photography has dramatically improved. In addition, finer scale mapping of vegetation communities that has been created from recent aerial photography and ground-truthing is now available.

The original SEPP 14 mapping considered wetlands as "being vegetated by one or more of a set of community types which were 'wetland' for the purposes of the policy" (Adam, 1992). Adam (1992) notes that the original mapping was not intended to a have a precise set of criteria for defining the CW and LR mapping.

Winning (1991) suggests there would be benefit in the criteria for mapping being standardised and more precise.

Santillan (2011) highlights the complexity of assessing and identifying wetlands because of the impacts on the landscape of human occupation and climate change. There is also natural temporal variability in boundaries.

Whilst Byron Shire Council did provide submissions about CW and LR mapping in 2018 and 2022, the feedback largely related to errors in the mapping boundaries and exclusion of operational areas (e.g. STP treatment ponds which may require dredging). Omissions of CW and LR from the original SEPP mapping were not detailed by Council (with a few exceptions) as this was not within the scope of the review.

Winning (1991) undertook a review of mapping on the Tomaree Peninsula near Port Stephens. He did assess omissions from the original mapping and concluded that approximately 16% of the location met the Adam *et al.* (1985) criteria for CW and LR mapping but were not contained in the SEPP.

4. Proposed Criteria for Updating CW and LR Mapping

By detailing more precise criteria for CW and LR, the mapping may be standardised (as suggested by Winning (1991)) and more accurately represent the location of the communities.

It should be noted however that the proposed approach outlined in this report is a rapid assessment that will require ground-truthing to validate the accuracy of the condition and species makeup. It is also a "snapshot in time" based on recent vegetation mapping which will need to be regularly reassessed.

The structural and floristic classification by Keith (2004) for wetlands represents a relevant and current system for vegetation classes for the coastal wetland mapping. It aligns with previous classifications and was adopted as the framework for preparation of version 3.03 of the NSW vegetation map. It is noted that the current NSW State Vegetation Type Map (SVTM) created by the State Government supersedes Keith (2004) and other preliminary mapping documents.

The work of both Keith (2004) and Floyd (1990) are used for the classification of littoral rainforest.

Keith (2004) and Floyd (1990) will inform the proposed updated criteria outlined below.

4.1 Proposed Coastal Wetland Mapping Criteria

Wetlands are "areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres and may incorporate riparian and coastal zones adjacent to the wetlands, and islands or bodies of marine water deeper than six metres at low tide lying within the wetlands" (sourced from the RAMSAR Convention on Wetland website; https://www.dcceew.gov.au/water/wetlands/ramsar).

The *Coastal Management Act 2016* defines coastal wetlands and littoral rainforests as the land identified by a State environmental planning policy to be the coastal wetlands and littoral rainforests

area for the purposes of this Act, being land which displays the hydrological and floristic characteristics of coastal wetlands or littoral rainforests and land adjoining those features.

In the coastal context, wetland habitats may include seagrass meadows (and other aquatic macrophyte beds), mangrove areas or saltmarsh swamps, dune lakes, wave-dominated and tide-dominated deltas, wave-dominated and tide-dominated estuaries, sandplains and coastal lagoons, coral reefs, sand/mudflats, tidal creeks, coastal floodplains, distributary channels, drainage depressions, ox-bow lakes, back levee swamps, sedge lands, and swamp forests (sourced from https://ozcoasts.org.au/indicators/biophysical-indicators/changes_wetland_cover/) .

Keith (2004) identifies three formations of wetlands in NSW. These are Freshwater wetlands, Saline wetlands and Forested wetlands. Within these formations the relevant classes for Byron Shire considered in mapping of coastal wetlands are:

1. Saline wetlands: Mangrove Swamps and Saltmarshes (Submerged communities such as Seagrasses excluded as per Adam *et al.* (1985))
2. Forested wetlands: Coastal Swamp Forests, Coastal floodplain wetlands (Riverine Forests excluded).
3. Freshwater wetlands: Coastal Heath Swamps (heathland excluded *as rarely associated with bodies of standing water as* per Adam *et al.* (1985)), Coastal Freshwater Lagoons, Wet Meadows.

The criteria for identifying coastal wetlands in NSW are detailed in Table B below.

Table B - Proposed Coastal Wetlands Mapping Criteria for 2023 Review - Byron Shire
(Note: the criteria with a superscript number are additional criteria to the original Adam *et al*. (1985) criteria.

Vegetation Formation *(Keith, 2004)*	***Vegetation Class*** *(Keith, 2004)*	***Criteria***	***Key Flora Species***	***Biodiversity Conservation Act 2016 Listing***
Saline wetlands	Mangrove Swamp	• Mangroves are the dominant vegetation type • Subject to inundation by tidal waters; occur below the level of Highest Astronomical Tide (HAT) [1] • Area > 5,000 sqm [2]	*Aegiceras corniculatum, Avicennia marina, Rhizophora stylosa, Bruguiera gymnorhiza, Excoecaria agallocha, Acrostichum speciosum*	
	Saltmarshes	• Saltmarsh plants are the dominant vegetation type • Subject to inundation by tidal waters; occur below the level of Highest Astronomical Tide (HAT) [1] • Area > 5,000 sqm [2]	*Baumea juncea, Juncus krausii subsp. australiensis, Sarcocornia quinqueflora subsp. quinqueflora, Sporobolus virginicus, Triglochin striata, Ficinia nodosa, Samolus repens, Selliera radicans, Suaeda australis, Zoysia macrantha*	Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions Conservation status in NSW: Endangered Ecological community
Forested wetlands	Coastal swamp forests	• Melaleuca and Eucalyptus are the dominant vegetation with ferns, sedges • Vegetation is Mature or Old Growth [3] • Below 20m elevation [4] • Within 100 year flood level [5]	*Eucalyptus robusta, Melaleuca quinquenervia, Callistemon salignus, Casuarina glauca, Eucalyptus resinifera subsp. hemilampra), Livistona australis and Lophostemon suaveolens, Acacia irrorata, Acmena smithii, Elaeocarpus reticulatus, Glochidion ferdinandi, Melaleuca linariifolia and M. styphelioides. S Acacia longifolia, Dodonaea triquetra, Ficus coronata,*	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions Conservation status in NSW: Endangered Ecological

		• Perennially high water table, temporary pools of water, bare ground • Deep, sandy and humus laden soils [6] • Area > 5,000 sqm [2]	*Leptospermum polygalifolium subsp. polygalifolium and Melaleuca spp. Gahnia clarkei, Pteridium esculentum, Hypolepis muelleri, Calochlaena dubia, Dianella caerulea, Viola hederacea, Lomandra longifolia, Entolasia marginata and Imperata cylindrica.*	community
	Coastal Floodplain Forests	• Dominated by Casuarina glauca (Swamp Oak) • Groundwater is saline or sub-saline and site is waterlogged or periodically inundated [7] • Below 20m elevation [4] • Vegetation is mature or old Growth [3] • Area is > 5,000 sqm [2]	*Acmena smithii, Alphitonia excelsa, Alternanthera denticulata, Baumea juncea, Blechnum indicum, Callistemon salignus, Carex appressa, Casuarina glauca, Centella asiatica, Commelina cyanea, Crinum pedunculatum, Cupaniopsis anacardioides, Cynodon dactylon, Dianella caerulea, Entolasia marginata, Enydra fluctuans, Flagellaria indica, Gahnia clarkei, Geitonoplesium cymosum, Glochidion ferdinandi, Glochidion sumatranum, Hypolepis muelleri, Imperata cylindrica var. Major, Isolepis inundata, Juncus kraussii subsp. Australiensis, Juncus planifolius, Juncus usitatus, Lobelia alata, Lomandra longifolia, Lophostemon suaveolens, Maundia triglochinoides, Melaleuca alternifolia,, Melaleuca quinquenervia, Melaleuca styphelioides, Myoporum acuminatum, Oplismenus imbecillis, Parsonsia straminea, Persicaria decipiens, Persicaria strigosa, Phragmites australis, Selliera radicans, Smilax australis, Stephania japonica var. discolor, Viola banksii*	Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions. Conservation status in NSW: Endangered Ecological community
Freshwater wetlands	Coastal Heath Swamps	• Dominated by sedges, with sclerophyllous shrubs and herbs. • Below 10m elevation [8] • Trees generally absent [9]	*Baloskion tetraphyllum, Baumea rubiginosa, Blechnum indicum, Chorizandra sphaerocephala, Eleocharis sphacelata, Entolasia stricta, Epacris obtusifolia, Eurychorda complanata, Gahnia sieberiana, Lepironia articulata, Leptocarpus tenax,*	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions

			Selaginella uliginosa, Sphagnum cristatum, Sprengelia incarnata, Xanthorrhoea fulva, Xyris operculate Banksia spp.	Conservation status in NSW: Endangered Ecological community
	Coastal Freshwater Lagoons	• Mosaics of sedgeland, aquatic herbfields and open water • Below 10m elevation [8] • Semi-permanently or permanently inundated • Intersects water table • Includes floodplain lagoons, backswamps	*Lepironia articulata, Eleocharis sphacelata, Baumea articulata, B. tetragona, Isachne globosa, Lepidosperma longitudinale, Villarsia exaltata, Ludwigia peploides ssp. montevidensis, Alisma plantago-aquatica, Ranunculus inundates, Hydrocotyle peduncularis*	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions Conservation status in NSW: Endangered Ecological community
	Wet Meadows	• Dominated by grasses (Poaceae) • Seasonally inundated grasslands • Often grazed [10] • Below 10m elevation [6] • High water table, sometimes peaty soils	*Paspalum distichum, Leersia hexandra, Pseudoraphis spinescens* and *Carex appressa. Persicaria* spp., with *Phragmites australis, Typha orientalis.*	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions Conservation status in NSW: Endangered Ecological community

[1] Subject to inundation by tidal waters; occur below the level of Highest Astronomical Tide (HAT).

Adam *et al.* (1985) note that Mangroves and Saltmarshes are dependent on inundation by tidal waters. This definition has been expanded as per Mangrove Wetlands - Wetlands Management Profile Queensland Government as:

Mangrove wetlands are invariably in the intertidal zone and sometimes extend narrowly for many kilometres inland along tidal rivers, also around some near-shore islands. Accordingly, they are below the level of Highest Astronomical Tide (HAT) and typically are in the lower, most frequently and deeply inundated parts of the intertidal zone.

Saltmarsh is situated in the intertidal zone, below the level of Highest Astronomical Tide (HAT) but well above the low tide level. The highest areas of saltmarsh may be inundated with seawater by only the highest spring tides.

[2] Area > 5,000 sqm

A minimum patch area of 5000 sqm was chosen for the following reasons:

- This area is consistent with the scale of the Council's vegetation mapping.
- This area is consistent with the minimum area used to generate environmental zones in Byron Shire.

Where a small patch is in close proximity to another patch, it is considered to be part of a larger connected patch.

It is understood that the DPE-Coastal Policy team are considering adoption of a minimum patch size of 400sqm. When this methodology is finalised by the Department, patches < 5000 sqm may be considered.

[3] Vegetation is Mature or Old Growth.

Byron Shire Council vegetation mapping includes landscape condition categories:

- Old Growth/Excellent condition
- Mature Forest
- Advanced Regrowth
- Regrowth

Advanced regrowth and regrowth coastal wetland communities will be flagged as having potential for rehabilitation and restoration but do not meet the criteria for Byron Shire CW mapping.

[4] Below 20m elevation

Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions – Determination to make a minor amendment to Part 3 of Schedule 1 of the Threatened Species Conservation Act (https://www.environment.nsw.gov.au/Topics/Animals-and-plants/Threatened-species/NSW-Threatened-Species-Scientific-Committee/Determinations/Final-determinations/2011-2012/Swamp-Sclerophyll-Forest-on-Coastal-Floodplains-of-the-NSW-North-Coast-minor-amendment-Determination) notes that Swamp Sclerophyll Forest on Coastal Floodplains generally occurs below 20 m elevation.

Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner bioregions – Determination to make a minor amendment to Part 3 of Schedule 1 of the Threatened Species Conservation Act (https://www.environment.nsw.gov.au/Topics/Animals-and-plants/Threatened-species/NSW-Threatened-Species-Scientific-Committee/Determinations/Final-determinations/2011-2012/Swamp-Oak-Floodplain-Forest-of-the-NSW-North-Coast-minor-amendment-Determination) note that Swamp Oak Floodplain Forest generally occurs below 20 m (rarely above 10 m) elevation in the NSW North Coast.

[5] Within 100 year flood level

Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions – Determination to make a minor amendment to Part 3 of Schedule 1 of the Threatened Species Conservation Act (https://www.environment.nsw.gov.au/Topics/Animals-and-plants/Threatened-species/NSW-Threatened-Species-Scientific-Committee/Determinations/Final-determinations/2011-2012/Swamp-Sclerophyll-Forest-on-Coastal-Floodplains-of-the-NSW-North-Coast-minor-amendment-Determination) notes that Swamp Sclerophyll Forest can be identified by the site being subject to waterlogging and/or below the highest flood level.

[6] Deep, sandy and humus laden soils

Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions – Determination to make a minor amendment to Part 3 of Schedule 1 of the Threatened Species Conservation Act (https://www.environment.nsw.gov.au/Topics/Animals-and-plants/Threatened-species/NSW-Threatened-Species-Scientific-Committee/Determinations/Final-determinations/2011-2012/Swamp-Sclerophyll-Forest-on-Coastal-Floodplains-of-the-NSW-North-Coast-minor-amendment-Determination) notes that Swamp Sclerophyll Forest can be identified by humic clay or sandy loams soils.

[7] Groundwater is saline or sub-saline and site is waterlogged or periodically inundated

Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner bioregions – Determination to make a minor amendment to Part 3 of Schedule 1 of the Threatened Species Conservation Act (https://www.environment.nsw.gov.au/Topics/Animals-and-plants/Threatened-species/NSW-Threatened-Species-Scientific-Committee/Determinations/Final-determinations/2011-2012/Swamp-Oak-Floodplain-Forest-of-the-NSW-North-Coast-minor-amendment-Determination) describes Swamp Oak Floodplain Forest as having groundwater that is saline or sub-saline, on waterlogged or periodically inundated flats, drainage lines, lake margins and estuarine fringes associated with coastal floodplains.

[8] Below 10m elevation

Freshwater Wetlands on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions – Determination to make minor amendment to Part 3 of Schedule 1 of the *Threatened Species Conservation Act 1995* (https://www.environment.nsw.gov.au/topics/animals-and-plants/threatened-species/nsw-threatened-species-scientific-committee/determinations/final-determinations/2008-2010/freshwater-wetlands-coastal-floodplains-determination-amendment) note that Freshwater Wetlands on Coastal Floodplains generally occur below 20 m elevation in the NSW North Coast, Sydney Basin and South East Corner bioregions. A review of freshwater wetlands in Byron Shire identifies these communities as occurring below 10m elevation.

[9] Trees generally absent

Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions – profile (https://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10929) notes that this community has very few woody species.

[10] Often grazed

Expert ecological advice notes that these areas in Byron Shire are generally on farmland and grazed.

Exclusions from coastal wetlands mapping:

- Artificially created wetlands; dams, drains, canals, freshwater lakes.
- Highly disturbed wetlands; weeds dominant, extensive clearing.
- Forest vegetation communities that are predominantly regrowth or advanced regrowth.

As previously noted, advanced regrowth and regrowth communities will be flagged as having potential for rehabilitation and restoration but do not meet the criteria for Byron Shire CW mapping outlined in this report.

4.2 Proposed Littoral Rainforest Mapping Criteria

Littoral rainforests are classified as the maritime influenced formation of subtropical rainforest (Floyd, 1990; Keith, 2004). The species composition is listed under the *Cupaniopsis anarcardiodes* (Tuckeroo) – *Acmena* (Lilly Pilly) alliance (Floyd, 1990). In NSW, following Floyd (1990), littoral rainforests are further divided into 5 suballiances, depending on the main tree species present:

- *Suballiance 16 Lilly Pilly – Broad-leaved Lilly Pilly (Syzgium leuhmannii – Acmena hemilampra)*
- *Suballiance 17: Tuckeroo (Cupaniopsis anacardioides)*
- *Suballiance 18: Brush-Box (Lophostemon confertus)*
- *Suballiance 19: Yellow Tulipwood –Yellow Aspen – Red Olive Berry – Brown Pine (Drypetes deplanchei-Sarcomelicope simplicifolia – Elaeodendron australis – Podocarpus elatus)*
- *Suballiance 20: Lilly Pilly – Fig tree – Cabbage-tree Palm – Brown Pine (Acmena smithii – Ficus spp. – Livistona australis – Podocarpus elatus)*

A mixture of these main types may occur in one patch of littoral rainforest.

Keith (2004) classifies littoral rainforest as a vegetation class under the vegetation formation of rainforest. The vegetation class is defined by shared species, structural and/or habitat features and notes variations in species with increasing latitude. Littoral rainforest substrate could be coastal sand dunes, or basalt, rhyolite and mudstones. Effects of sea spray provide nutrients and the wind-shear effect is a crucial feature of the structure where exposed to the ocean.

The report, Littoral Rainforest in the NSW North Coast, Sydney Basin and South East Corner Bioregions - Determination to make a minor amendment to Part 3 of Schedule 1 of the Threatened Species Conservation Act (https://www.environment.nsw.gov.au/topics/animals-and-plants/threatened-species/nsw-threatened

-species-scientific-committee/determinations/final-determinations/2011-2012/littoral-rainforest-in-the-new-south-wales-north-coast-minor-amendment-determination) provides additional information on the criteria used to define LR.

Criteria for identifying littoral rainforests in NSW are detailed in Table C below.

Table C - Littoral Rainforest Mapping Criteria for 2023 Review - Byron Shire

Vegetation Community	*Criteria*	*Key Flora Species*	*Biodiversity Conservation Act 2016 Listing*
Littoral Rainforest	• Dominated by rainforest community and falls into one of the suballiances: ➢ Suballiance 16: Small-leaved Lilly Pilly – Broad-leaved Lilly Pilly (*Syzgium leuhmannii – Acmena hemilampra*) ➢ Suballiance 17: Tuckeroo (*Cupaniopsis anacardioide*s) ➢ Suballiance 18: Brush-Box (*Lophostemon confertus*) ➢ Suballiance 19: Yellow Tulipwood –Yellow Aspen – Red Olive Berry – Brown Pine (*Drypetes deplanchei-Sarcomelicope simplicifolia – Elaeodendron australis – Podocarpus elatus*) ➢ Suballiance 20: Lilly Pilly – Fig tree – Cabbage-tree Palm – Brown Pine (*Acmena smithii – Ficus spp. – Livistona australis – Podocarpus elatus*)	*Acacia binervata, Acmena hemilampra, Acmena smithii, Acronychia imperforata, Acronychia oblongifolia, Alpinia caerulea, Alectryon coriaceus, Alyxia ruscifolia, Aphananthe philippinensis, Archontophoenix cunninghamiana, Arthropteris tenella, Arytera divaricata, Asplenium australasicum, Baloghia marmorata, Banksia integrifolia subsp. Integrifolia, Beilschmiedia obtusifolia, Breynia oblongifolia, Bridelia exaltata, Calamus muelleri, Canthium coprosmoides, Capparis arborea, Cayratia clematidea, Celtis paniculata, Cissus antarctica, Cissus hypoglauca, Cissus sterculiifolia, Claoxylon australe, Cordyline congesta, Cordyline stricta, Cryptocarya glaucescens, Cryptocarya microneura, Cryptocarya triplinervis, Cupaniopsis anacardioides, Cynanchum elegans, Dendrocnide excelsa, Dendrocnide photinophylla, Dioscorea transversa, Diospyros australis, Diospyros pentamera, Doodia aspera, Duboisia myoporoides, Dysoxylum fraserianum, Ehretia acuminata, Elaeocarpus obovatus, Elattostachys nervosa, Endiandra discolor, Endiandra sieberi, Eucalyptus botryoides, Eucalyptus tereticornis, Eupomatia laurina, Eustrephus latifolius, Ficus coronata, Ficus obliqua, Ficus rubiginosa, Ficus*	Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions Conservation status in NSW: Endangered.

	• Generally < 2km from the ocean [1] • >70% canopy cover [2] • Low occurrence of fire [3] • Area > 5,000 sqm [4]	*watkinsiana, Flagellaria indica, Geitonoplesium cymosum, Glochidion ferdinandi, Glycine clandestina, Gossia bidwillii, Guioa semiglauca, Ixora beckleri, Jagera pseudorhus,Lepidozamia peroffskyana, Litsea reticulata, Livistona australis, Lomandra longifolia, Lophostemon confertus, Maclura cochinchinensis, Mallotus philippensis, Melaleuca quinquenervia, Melicope micrococca, Melicope vitiflora, Mischocarpus pyriformis, Monococcus echinophorus, Morinda jasminoides, Mucuna gigantea, Myoporum acuminatum, Notelaea longifolia, Olea paniculata, Oplismenus imbecillis, Pandanus pedunculatus, Pandorea pandorana, Pararchidendron pruinosum var. Pruinosum, Parsonsia straminea, Pentaceras australis, Piper novae-hollandiae, Pisonia umbellifera, Pittosporum multiflorum, Pittosporum undulatum, Platycerium bifurcatum, Podocarpus elatus, Pollia crispata, Polyscias elegans, Pouteria australis, Pouteria cotinifolia var. Cotinifolia, Pouteria myrsinoides, Rapanea variabilis, Rhodamnia rubescens,Rhodomyrtus psidioides, Ripogonum album, Ripogonum discolor, Sarcomelicope simplicifolia, Scolopia braunii, Smilax australis, Smilax glyciphylla, Sophora tomentosa subsp. Australis, Stephania japonica var. Discolor, Synoum glandulosum, Syzygium australe, Syzygium luehmannii, Syzygium oleosum,*	

		Syzygium paniculatum, Tetrastigma nitens, Trophis scandens subsp. Scandens, Viola banksii, Wilkiea huegeliana	

[1] Generally < 2km from the ocean.

[2] >70% canopy cover

[3] Low occurrence of fire

[4] Area > 5,000 sqm

These criteria have been referenced from the DPE document, *Identification Guidelines for Endangered Ecological Communities* (2008):

- Littoral rainforest is a closed forest ecological community recognised by its close proximity to the ocean (generally <2km).
- Closed canopy (i.e., ~70% of the sky obscured by tree leaves and limbs).
- There has been a low occurrence of fire (i.e., few burnt tree trunks, well developed shrub layer; few sclerophyllous plants)?
- A minimum patch area of 5000 sqm was chosen for the following reasons:
- This area is consistent with the scale of Council's vegetation mapping.
- This area is consistent with the minimum area used to generate environmental zones in Byron Shire.

Where a small patch is in close proximity to another patch, it is considered to be part of a larger connected patch.

It is understood that the DPE-Coastal Policy team are considering adoption a minimum patch size of 400sqm. When this methodology is finalised by the Department, patches < 5000 sqm may be considered.

Exclusions from littoral rainforests mapping:

- Highly disturbed vegetation; weeds dominant, extensive clearing.
- Forest vegetation communities that are predominantly regrowth or advanced regrowth.

As previously noted, advanced regrowth and regrowth communities will be flagged as having potential for rehabilitation and restoration but do not meet the criteria for Byron Shire LR mapping.

5. Datasets

- Aerial photography; April - June 2023 NearMaps.
- Byron Shire (excluding National Park Estate) - Council's 2023 Vegetation mapping is current and of a higher accuracy than the State Government's NSW PCT mapping. It also includes information about vegetation condition and canopy.
- Byron Shire within National Park Estate:
  - *Cape Byron Arakwal Veg 2013*
  - *Tyagarah NR 2016*
  - *Billinudgel NR 1998*
  - *NSW State Vegetation Type Mapping (SVTM) June 2022 mapping*

6. References

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Appendix E - Proposed additions to Littoral Rainforest Mapping

Map ID	Vegetation Community (Council' Vegetation Mapping)	Year Site Validated	Condition	Canopy	Validation Type	Comments	Area (Ha)	National Park
1	Littoral Rainforest-Swamp sclerophyll		Mature Forest	51-80%	No ground truthing	Byron Environment and Conservation Group: LRf to include. EarthScapes Ecologist: meets criteria.	0.52	
2	Brush Box-Littoral Rainforest	2019	Mature Forest	81-100 %	Seen from edge of polygon	EarthScapes Ecologist: meets criteria. Connected to remnant.	0.32	
3	Rainforest	2021	Mature Forest	81-100 %	Seen from edge of polygon	EarthScapes Ecologist: meets criteria.	16.93	
4	Brush Box-Rainforest	2017	Old Growth/excellent condition	81-100 %	Walk through	EarthScapes Ecologist: meets criteria.	11.09	
5	Brush Box-Rainforest	2014	Mature Forest	51-80%	Seen from edge of polygon	EarthScapes Ecologist: meets criteria.	0.73	
6	Brush Box	2021	Mature Forest	51-80%	Distance assessment	EarthScapes Ecologist: meets criteria.	0.77	
7	Brush Box-Coast Banksia-Rainforest	2019	Mature Forest	51-80%	Distance assessment	EarthScapes Ecologist: meets criteria.	0.77	
8	Brush Box-Rainforest	2019	Mature Forest	81-100 %	Walk through	EarthScapes Ecologist: meets criteria.	9.94	
9	Brush Box-Rainforest	2019	Old Growth/excellent condition	81-100 %	Seen from edge of polygon	EarthScapes Ecologist: meets criteria.	1.81	
10	Brush Box-Rainforest		Mature Forest	81-100 %	No ground truthing	EarthScapes Ecologist: meets criteria.	14.96	
11	Brush Box-Rainforest		Old Growth/excellent condition	81-100 %	No ground truthing	EarthScapes Ecologist: meets criteria.	7.62	
12	Brush Box-Rainforest	2019	Old Growth/exc	81-100 %	Seen from edge of polygon	EarthScapes Ecologist: meets criteria.	3.67	

			ellent condition					
13	Brush Box-Rainforest	2012	Mature Forest	51-80%	Seen from edge of polygon	EarthScapes Ecologist: meets criteria.	5.32	
14	Brush Box-Rainforest	2014	Old Growth/excellent condition	81-100 %	Walk through	EarthScapes Ecologist: meets criteria.	1.44	
15	Rainforest		Mature Forest	81-100 %	No ground truthing	EarthScapes Ecologist: meets criteria.	2.03	
16	Brush Box-Rainforest		Old Growth/excellent condition	81-100 %	No ground truthing	EarthScapes Ecologist: meets criteria.	0.83	
17	Brush Box-Bangalow Palm-Rainforest	2019	Mature Forest	51-80%	Seen from edge of polygon	EarthScapes Ecologist: meets criteria.	3.52	
18	Rainforest	2017	Mature Forest	51-80%	Seen from edge of polygon	EarthScapes Ecologist: meets criteria.	7.20	
19	Rainforest	2023	Mature Forest	51-80%	Walk through	EarthScapes Ecologist: meets criteria. Connected to remnant.	0.49	
20	Rainforest	2023	Mature Forest	51-80%	Walk through	EarthScapes Ecologist: meets criteria. Connected to remnant.	0.15	
21	Rainforest	2014	Mature Forest	51-80%	Walk through	EarthScapes Ecologist: meets criteria.	4.62	
22	Brush Box-Rainforest		Old Growth/excellent condition	81-100 %	Seen from edge of polygon	EarthScapes Ecologist: meets criteria.	2.93	
23	Rainforest	2017	Mature Forest	51-80%	Walk through	EarthScapes Ecologist: meets criteria. Connected to remnant.	0.44	
24	Brush Box-Rainforest		Mature Forest	51-80%	No ground truthing	EarthScapes Ecologist: meets criteria.	1.60	
25	Rainforest		Mature Forest	51-80%	No ground truthing	EarthScapes Ecologist: meets criteria.	2.12	
26	Brush Box-Rainforest		Mature Forest	81-100 %	No ground truthing	EarthScapes Ecologist: meets criteria.	1.58	
27	Rainforest	2019	Mature Forest	51-80%	Seen from edge of polygon	EarthScapes Ecologist: meets criteria. Connected to remnant.	0.34	

28	Brush Box		Mature Forest	81-100 %	No ground truthing	EarthScapes Ecologist: meets criteria. Connected to remnant.	0.42	
29	Brush Box		Mature Forest	81-100 %	No ground truthing	EarthScapes Ecologist: meets criteria. Connected to remnant.	0.44	
30	Brush Box+Rainforest	2017	Mature Forest	81-100 %	No ground truthing	EarthScapes Ecologist: meets criteria.	0.61	
31	Brush Box+Rainforest	2017	Mature Forest	81-100 %	Distance assessment	EarthScapes Ecologist: meets criteria. Connected to remnant.	0.31	
32	Rainforest		Mature Forest	51-80%	No ground truthing	EarthScapes Ecologist: meets criteria.	0.50	
33	Coast Banksia-Coast Wattle-Rainforest	2014	Mature Forest	51-80%	Seen from edge of polygon	EarthScapes Ecologist: meets criteria.	0.60	
34	Brush Box-Rainforest	2019	Mature Forest	51-80%	Seen from edge of polygon	EarthScapes Ecologist: - meets criteria.	8.24	
35	Brush Box-Rainforest	2019	Mature Forest	51-80%	Seen from edge of polygon	EarthScapes Ecologist: - meets criteria.	0.71	
36	Brush Box-Rainforest	2019	Mature Forest	51-80%	Seen from edge of polygon	EarthScapes Ecologist: - meets criteria.	2.66	
37	Brush Box-Rainforest	2019	Mature Forest	51-80%	Seen from edge of polygon	EarthScapes Ecologist: - meets criteria.	0.51	
38	Brush Box-Rainforest	2017	Old Growth/excellent condition	81-100 %	Walk through	EarthScapes Ecologist: meets criteria.	3.19	
39	Littoral Rainforest	2017	Mature Forest	51-80%	Walk through	EarthScapes Ecologist: meets criteria. Connected to remnant.	0.03	
40	Brush Box-Rainforest		Old Growth/excellent condition	81-100 %	No ground truthing	EarthScapes Ecologist: meets criteria.	0.50	
41	Brush Box-Rainforest	2012	Mature Forest	51-80%	Seen from edge of polygon	EarthScapes Ecologist: meets criteria.	1.91	
42	Littoral Rainforest				No ground truthing	Council staff: Large Tuckeroos but pathways. EarthScapes Ecologist: meets criteria.	0.84	
43	Littoral Rainforest				No ground truthing	Council staff: Includes fire and disturbance. Cavanbah dunes; Syzygium oleosum, 3 Veined	2.31	

						Laurel		
44	Rainforest	2019	Mature Forest	51-80%	Distance assessment	EarthScapes Ecologist: meets criteria.	1.20	
45	Brush Box-Littoral Rainforest	2019	Mature Forest	81-100 %	Seen from edge of polygon	EarthScapes Ecologist: meets criteria. Connected to remnant.	0.17	
46	Brush Box-Rainforest		Mature Forest	81-100 %	No ground truthing	EarthScapes Ecologist: meets criteria.	1.30	
47	Brush Box-Rainforest	2017	Old Growth/excellent condition	81-100 %	Seen from edge of polygon	EarthScapes Ecologist: meets criteria.	4.00	
48	Brush Box-Rainforest	2017	Mature Forest	81-100 %	Seen from edge of polygon	EarthScapes Ecologist: meets criteria. Connected to remnant.	0.41	
49	Brush Box-Coast Banksia-Rainforest	2019	Mature Forest	51-80%	Seen from edge of polygon	EarthScapes Ecologist: meets criteria.	3.23	
50	Brush Box-Rainforest	2021	Old Growth/excellent condition	81-100 %	Seen from edge of polygon	EarthScapes Ecologist: meets criteria.	0.89	
51	Brush Box-Rainforest	2017	Mature Forest	81-100 %	Walk through	EarthScapes Ecologist: meets criteria. Connected to remnant.	0.43	
52	Brush Box-Rainforest	2017	Old Growth/excellent condition	81-100 %	Walk through	EarthScapes Ecologist: meets criteria.	1.14	
53	Brush Box-Rainforest	2014	Old Growth/excellent condition	81-100 %	Seen from edge of polygon	EarthScapes Ecologist: meets criteria.	0.09	
54	Brush Box-Rainforest	2017	Mature Forest	81-100 %	Walk through	EarthScapes Ecologist: meets criteria. Connected to remnant.	0.10	
55	Brush Box-Rainforest	2017	Mature Forest	81-100 %	No ground truthing	EarthScapes Ecologist: meets criteria. Connected to remnant.	0.09	
56	Littoral Rainforest					NPWS: Areas within Broken Head NR have floristic characteristics of SEPP 26. A walk through would confirm these areas	1.54	Y

57	Littoral Rainforest					NPWS: Areas within Broken Head NR have floristic characteristics of SEPP 26. A walk through would confirm these areas	2.51	Y
58	Littoral Rainforest					NPWS: Areas within Broken Head NR have floristic characteristics of SEPP 26. A walk through would confirm these areas	2.29	Y
59	Littoral Rainforest					NPWS: Areas within Broken Head NR have floristic characteristics of SEPP 26. A walk through would confirm these areas	0.95	Y
60	Littoral Rainforest					From Cape Byron Veg Mapping. Connected to remnant.	0.24	Y
61	Littoral Rainforest					From Cape Byron Veg Mapping. Connected to remnant.	0.04	Y
62	Littoral Rainforest					From Cape Byron Veg Mapping. Connected to remnant.	0.25	Y
63	Littoral Rainforest					From Cape Byron Veg Mapping. Connected to remnant.	0.30	Y
64	Littoral Rainforest					From Cape Byron Veg Mapping. Connected to remnant.	0.36	Y
65	Littoral Rainforest					From Cape Byron Veg Mapping. Connected to remnant.	0.17	Y
66	Littoral Rainforest					From Cape Byron Veg Mapping. Connected to remnant.	0.48	Y
67	Littoral Rainforest					From Cape Byron Veg Mapping. Connected to remnant.	0.07	Y
68	Littoral Rainforest					From Cape Byron Veg Mapping. Connected to remnant.	0.18	Y
69	Littoral Rainforest					From Cape Byron Veg Mapping. Connected to remnant.	0.49	Y
70	Littoral Rainforest					From Cape Byron Veg Mapping. Connected to remnant.	0.29	Y
71	Littoral Rainforest					From Cape Byron Veg Mapping	1.17	Y

72	Littoral Rainforest					From Cape Byron Veg Mapping. Connected to remnant.	0.35	Y
73	Littoral Rainforest					From Cape Byron Veg Mapping. Connected to remnant.	0.29	Y
74	Littoral Rainforest					From Cape Byron Veg Mapping. Connected to remnant.	0.11	Y
75	Littoral Rainforest					From Cape Byron Veg Mapping. Connected to remnant.	0.32	Y
76	Littoral Rainforest					From Cape Byron Veg Mapping. Connected to remnant.	0.20	Y
77	Littoral Rainforest					From Cape Byron Veg Mapping. Connected to remnant.	0.10	Y
78	Littoral Rainforest					From Cape Byron Veg Mapping. Connected to remnant.	0.37	Y
79	Littoral Rainforest					From Cape Byron Veg Mapping. Connected to remnant.	0.18	Y
80	Littoral Rainforest					From Cape Byron Veg Mapping	0.74	Y
82	Littoral Rainforest					Lori Cameron and Emma Kirsner NPWS	12.25	Y
83	Littoral Rainforest					Lori Cameron and Emma Kirsner NPWS	5.03	Y
84	Littoral Rainforest					Lori Cameron and Emma Kirsner NPWS	21.43	Y
85	Littoral Rainforest					Lori Cameron and Emma Kirsner NPWS	19.09	Y
86	Littoral Rainforest					Lori Cameron and Emma Kirsner NPWS	2.66	Y
87	Littoral Rainforest					Lori Cameron and Emma Kirsner NPWS	8.55	Y
88	Littoral Rainforest					Lori Cameron and Emma Kirsner NPWS	8.41	Y
89	Littoral Rainforest					From Cape Byron Veg Mapping. Connected to remnant.	0.23	Y
90	Littoral Rainforest					From Cape Byron Veg Mapping. Connected to remnant.	0.21	Y
91	Littoral Rainforest					From Cape Byron Veg Mapping. Connected to remnant.	0.07	Y

Appendix F - Proposed additions to Coastal Wetland Mapping

Map ID	Vegetation Type (Council's Vegetation Mapping)	Vegetation Community (Council's Vegetation Mapping)	Year Site Validated	Condition	Canopy	Validation Type	Comments	Area (Ha)	National Park
1	Sedgeland-Fernland-Grassland	Coastal Heath Swamps	2017	Advanced regrowth	81-100 %	Verification from other sources	EarthScapes Ecologist: meets criteria	1.78	
2	Grassland-Sedgeland-Fernland	Coastal Freshwater Lagoons	2022	Advanced regrowth	51-80 %	No ground truthing	EarthScapes Ecologist: meets criteria. Council STP staff - used as buffer between the STP and adjacent Habitat commercial/residential area.	1.01	
3	Sedgeland-Paperbark	Coastal Freshwater Lagoons	2022	Advanced regrowth	51-80 %	No ground truthing	EarthScapes Ecologist: meets criteria. Council STP staff - used as buffer between the STP and adjacent Habitat commercial/residential area.	0.19	
4	Sedgeland-Grassland	Coastal Freshwater Lagoons	2022	Advanced regrowth	51-80 %	No ground truthing	EarthScapes Ecologist: meets criteria. Council STP staff - used as buffer between the STP and adjacent Habitat commercial/residential area.	0.32	
5	Sedgeland-Grassland	Coastal Freshwater Lagoons	2022	Advanced regrowth	51-80 %	Distance assessment	EarthScapes Ecologist: meets criteria. Council STP staff - used as buffer between the STP and adjacent Habitat	1.61	

							commercial/residential area.		
6	Sedgeland-Fernland-Grassland	Coastal Heath Swamps	2017	Mature Forest	81-100 %	Distance assessment	EarthScapes Ecologist: meets criteria	0.64	
7	Sedgeland-Fernland-Grassland	Coastal Heath Swamps	2017	Mature Forest	81-100 %	Distance assessment	EarthScapes Ecologist: meets criteria	2.61	
8	Red-fruit Saw Sedge-Coral Fern	Coastal Heath Swamps		Old Growth/excellent condition	81-100 %	No ground truthing	EarthScapes Ecologist: meets criteria	0.81	
9	Paperbark	Coastal swamp forests		Mature Forest	51-80 %	No ground truthing	EarthScapes Ecologist: meets criteria	3.99	
10	Paperbark-Rainforest-Swamp Oak	Coastal swamp forests	2023	Mature Forest	51-80 %	Seen from edge of polygon	EarthScapes Ecologist: meets criteria. Connected.	0.52	
11	Paperbark-Rainforest	Coastal swamp forests		Mature Forest	81-100 %	No ground truthing	EarthScapes Ecologist: meets criteria.	5.47	
12	Paperbark	Coastal swamp forests		Mature Forest	51-80 %	No ground truthing	EarthScapes Ecologist: meets criteria.	0.50	
13	Paperbark	Coastal swamp forests		Mature Forest	51-80 %	No ground truthing	Byron Environment and Conservation Group: Wetlands to be included. EarthScapes Ecologist: meets criteria.	2.56	
14	Paperbark	Coastal swamp forests		Mature Forest	51-80 %	No ground truthing	Byron Environment and Conservation Group: Wetlands to be included. EarthScapes Ecologist: meets criteria.	1.30	
15	Paperbark	Coastal swamp forests	2/7/2015	Mature	81-100	Seen from	Byron Environment	2.15	

				Forest	%	edge of polygon	and Conservation Group: Wetlands to be included. EarthScapes Ecologist: meets criteria.		
16	Paperbark	Coastal swamp forests	2017	Mature Forest	51-80 %	Seen from edge of polygon	EarthScapes Ecologist: meets criteria.	0.81	
17	Paperbark	Coastal swamp forests	2018	Mature Forest	51-80 %	Walk through	EarthScapes Ecologist: meets criteria.	1.01	
18	Paperbark-Swamp Oak	Coastal swamp forests	2022	Mature Forest	51-80 %	Walk through	EarthScapes Ecologist: meets criteria.	1.74	
19	Paperbark-Rainforest+Swamp Oak	Coastal swamp forests	6/11/2014	Mature Forest	51-80 %	Seen from edge of polygon	EarthScapes Ecologist: meets criteria. Connected.	0.73	
20	Paperbark	Coastal swamp forests	6/11/2014	Mature Forest	51-80 %	Walk through	EarthScapes Ecologist: meets criteria.	1.63	
21	Paperbark-Swamp Mahogany	Coastal swamp forests	7/11/2014	Mature Forest	51-80 %	Walk through	EarthScapes Ecologist: meets criteria. Connected.	0.59	
22	Paperbark	Coastal swamp forests		Mature Forest	81-100 %	No ground truthing	EarthScapes Ecologist: meets criteria.	1.44	
23	Paperbark	Coastal swamp forests		Mature Forest	51-80 %	No ground truthing	EarthScapes Ecologist: meets criteria	1.05	
24	Paperbark	Coastal swamp forests	26/11/2014	Mature Forest	51-80 %	Seen from edge of polygon	EarthScapes Ecologist: meets criteria	3.15	
25	Paperbark	Coastal swamp forests		Mature Forest	51-80 %	No ground truthing	EarthScapes Ecologist: meets criteria.	1.12	
26	Paperbark	Coastal swamp forests	27/11/2014	Mature Forest	81-100 %	Distance assessment	EarthScapes Ecologist: meets criteria.	1.44	

27	Paperbark	Coastal swamp forests	14/11/2014	Mature Forest	81-100 %	Walk through	EarthScapes Ecologist: meets criteria.	0.29	
28	Paperbark-Swamp Oak-Swamp Mahogany-Brush Box	Coastal swamp forests	2016	Old Growth/excellent condition	81-100 %	Seen from edge of polygon	EarthScapes Ecologist: meets criteria.	5.04	
29	Paperbark	Coastal swamp forests	2016	Old Growth/excellent condition	81-100 %	Seen from edge of polygon	EarthScapes Ecologist: meets criteria. Connected.	0.33	
30	Paperbark+Swamp Box, Rainforest	Coastal swamp forests	2019	Mature Forest	81-100 %	Walk through	EarthScapes Ecologist: meets criteria.	8.97	
31	Paperbark	Coastal swamp forests		Mature Forest	81-100 %	No ground truthing	EarthScapes Ecologist: meets criteria.	1.02	
32	Paperbark-Swamp Mahogany	Coastal swamp forests	24/11/2014	Mature Forest	51-80 %	Walk through	EarthScapes Ecologist: meets criteria.	0.59	
33	Paperbark+Swamp Box, Swamp Mahogany	Coastal swamp forests	2018	Mature Forest	51-80 %	Seen from edge of polygon	Byron Environment and Conservation Group: Wetlands to be included. EarthScapes Ecologist: meets criteria.	5.35	
34	Paperbark-Swamp Box	Coastal swamp forests		Mature Forest	81-100 %	No ground truthing	EarthScapes Ecologist: meets criteria. Connected.	0.13	
35	Paperbark	Coastal swamp forests	14/11/2014	Old Growth/excellent condition	81-100 %	No ground truthing		2.60	
36	Paperbark	Coastal swamp forests	2016	Old Growth/excellent condition	51-80 %	Walk through	EarthScapes Ecologist: meets criteria.	2.96	

37	Paperbark-Rainforest	Coastal swamp forests	2018	Mature Forest	51-80 %	Walk through	EarthScapes Ecologist: meets criteria.	0.49	
38	Paperbark	Coastal swamp forests		Mature Forest	51-80 %	No ground truthing	EarthScapes Ecologist: meets criteria.	12.03	
39	Paperbark	Coastal swamp forests		Mature Forest	51-80 %	No ground truthing	EarthScapes Ecologist: meets criteria.	3.56	
40	Paperbark	Coastal swamp forests	2017	Mature Forest	81-100 %	No ground truthing	EarthScapes Ecologist: meets criteria.	0.73	
41	Paperbark+Swamp Mahogany	Coastal swamp forests	9/12/2014	Mature Forest	51-80 %	Seen from edge of polygon	Byron Environment and Conservation Group: Wetlands to be included. EarthScapes Ecologist: meets criteria. Connected.	0.32	
42	Paperbark-Rainforest	Coastal swamp forests		Mature Forest	51-80 %	No ground truthing	Byron Environment and Conservation Group: coastal wetlands to be included. Connected.	0.39	
43	Paperbark	Coastal swamp forests		Mature Forest	51-80 %	No ground truthing	EarthScapes Ecologist: meets criteria	1.16	
44	Paperbark-Cheese Tree-Rainforest	Coastal swamp forests		Mature Forest	81-100 %	No ground truthing	Byron Environment and Conservation Group: Wetlands to be included. EarthScapes Ecologist: meets criteria.	0.50	
45	Paperbark	Coastal swamp forests		Mature Forest	51-80 %	No ground truthing	Byron Environment and Conservation Group: Wetlands to be included. EarthScapes	2.63	

							Ecologist: meets criteria.		
46	Paperbark+Swamp Mahogany	Coastal swamp forests	2018	Mature Forest	51-80 %	Seen from edge of polygon	Byron Environment and Conservation Group: Wetlands to be included. EarthScapes Ecologist: meets criteria. Connected.	0.39	
47	Paperbark-Rainforest	Coastal swamp forests	2018	Mature Forest	81-100 %	Seen from edge of polygon	EarthScapes Ecologist: meets criteria	7.63	
48	Paperbark	Coastal swamp forests	2018	Mature Forest	51-80 %	Seen from edge of polygon	EarthScapes Ecologist: meets criteria	2.27	
49	Paperbark-Camphor Laurel-Rainforest	Coastal swamp forests	2018	Mature Forest	81-100 %	Seen from edge of polygon	EarthScapes Ecologist: meets criteria	0.77	
50	Paperbark-Cheese Tree	Coastal swamp forests		Mature Forest	81-100 %	No ground truthing	Connected.	0.45	
51	Paperbark-Rainforest-Camphor Laurel	Coastal swamp forests		Mature Forest	81-100 %	No ground truthing		2.89	
52	Paperbark	Coastal swamp forests	2018	Mature Forest	51-80 %	No ground truthing	EarthScapes Ecologist: meets criteria	0.98	
53	Paperbark	Coastal swamp forests	2018	Mature Forest	51-80 %	No ground truthing	EarthScapes Ecologist: meets criteria	0.97	
54	Paperbark-Rainforest	Coastal swamp forests	2021	Mature Forest	81-100 %	Seen from edge of polygon	EarthScapes Ecologist: meets criteria	2.03	
55	Paperbark	Coastal swamp forests	2019	Old Growth/excellent condition	51-80 %	Walk through	EarthScapes Ecologist: meets criteria	1.43	
56	Paperbark	Coastal swamp forests	2019	Old Growth/excellent condition	51-80 %	Walk through	EarthScapes Ecologist: meets criteria	0.67	

57	Paperbark+Rainforest	Coastal swamp forests	2017	Mature Forest	81-100 %	Walk through	Byron Environment and Conservation Group: coastal wetlands to be included. EarthScapes Ecologist: meets criteria.	1.64	
58	Paperbark	Coastal swamp forests	2017	Mature Forest	81-100 %	Walk through	Byron Environment and Conservation Group: coastal wetlands to be included. EarthScapes Ecologist: meets criteria.	1.45	
59	Paperbark	Coastal swamp forests	2017	Mature Forest	51-80 %	Walk through	Byron Environment and Conservation Group: coastal wetlands to be included. EarthScapes Ecologist: meets criteria.	0.58	
60	Paperbark+Rainforest	Coastal swamp forests	2019	Mature Forest	51-80 %	Distance assessment	EarthScapes Ecologist: meets criteria	0.65	
61	Paperbark	Coastal swamp forests	2021	Mature Forest	81-100 %	Walk through	Byron Environment and Conservation Group: coastal wetlands to include. EarthScapes Ecologist: meets criteria. Connectivity	0.10	
62	Paperbark	Coastal swamp forests	2014	Mature Forest	81-100 %	Seen from edge of polygon	Byron Environment and Conservation Group: coastal wetlands to be included. EarthScapes	0.30	

							Ecologist: meets criteria. Connected.		
63	Paperbark-Brush Box-Swamp Oak	Coastal swamp forests		Mature Forest	51-80 %	No ground truthing	Byron Environment and Conservation Group: coastal wetlands to be included. EarthScapes Ecologist: meets criteria. Connected.	0.11	
64	Paperbark-Swamp Box	Coastal swamp forests	2014	Mature Forest	51-80 %	Seen from edge of polygon	Byron Environment and Conservation Group: coastal wetlands to be included. EarthScapes Ecologist: meets criteria.	0.45	
65	Paperbark	Coastal swamp forests		Old Growth/excellent condition	81-100 %	No ground truthing	EarthScapes Ecologist: meets criteria. Connected.	0.43	
66	Paperbark	Coastal swamp forests	2023	Mature Forest	51-80 %	Seen from edge of polygon	Byron Environment and Conservation Group: coastal wetlands to be included. EarthScapes Ecologist: meets criteria. Connected.	0.08	
67	Paperbark+Rainforest	Coastal swamp forests		Mature Forest	51-80 %	No ground truthing	EarthScapes Ecologist: meets criteria. Connectivity	0.34	
68	Paperbark+Rainforest	Coastal swamp forests		Old Growth/excellent condition	51-80 %	No ground truthing	EarthScapes Ecologist: meets criteria	0.79	
69	Paperbark	Coastal swamp forests	2016	Mature Forest	81-100 %	Seen from edge of polygon	EarthScapes Ecologist: meets criteria	2.37	

70	Paperbark	Coastal swamp forests	2016	Mature Forest	51-80 %	Seen from edge of polygon	EarthScapes Ecologist: meets criteria	4.15	
71	Paperbark-Eucalypt	Coastal swamp forests		Mature Forest	51-80 %	No ground truthing	EarthScapes Ecologist: meets criteria.	0.99	
72	Paperbark	Coastal swamp forests	2021	Mature Forest	51-80 %	Walk through		3.20	
73	Paperbark+Rainforest	Coastal swamp forests	29/10/2014	Mature Forest	81-100 %	Seen from edge of polygon	EarthScapes Ecologist: meets criteria.	2.02	
74	Paperbark	Coastal swamp forests	2017	Old Growth/excellent condition	81-100 %	No ground truthing	EarthScapes Ecologist: meets criteria.	4.86	
75	Paperbark+Rainforest	Coastal swamp forests		Old Growth/excellent condition	81-100 %	No ground truthing	EarthScapes Ecologist: meets criteria.	4.37	
76	Paperbark+Rainforest	Coastal swamp forests	2023	Mature Forest	51-80 %	Seen from edge of polygon	EarthScapes Ecologist: meets criteria.	2.48	
77	Paperbark-Swamp Box-Rainforest	Coastal swamp forests	2017	Old Growth/excellent condition	51-80 %	Seen from edge of polygon	EarthScapes Ecologist: meets criteria.	5.04	
78	Paperbark	Coastal swamp forests	2022	Mature Forest	81-100 %	Walk through	EarthScapes Ecologist: meets criteria.	0.79	
79	Paperbark-Rainforest	Coastal swamp forests	2020	Mature Forest	81-100 %	Walk through	EarthScapes Ecologist: meets criteria.	1.07	
80	Paperbark	Coastal swamp forests	2020	Mature Forest	81-100 %	Walk through	EarthScapes Ecologist: meets criteria.	0.51	
81	Paperbark	Coastal swamp forests	26/9/2014	Mature Forest	81-100 %	Distance assessment	EarthScapes Ecologist: meets criteria. Landowner confirmed.	6.10	

82	Paperbark-Swamp Mahogany-Swamp Box	Coastal swamp forests		Mature Forest	81-100 %	No ground truthing	EarthScapes Ecologist: meets criteria.	2.17	
83	Paperbark+Rainforest	Coastal swamp forests		Mature Forest	81-100 %	No ground truthing	EarthScapes Ecologist: meets criteria.	2.22	
84	Paperbark-Swamp Oak-Swamp Mahogany	Coastal swamp forests		Mature Forest	81-100 %	No ground truthing	EarthScapes Ecologist: meets criteria.	3.09	
85	Paperbark	Coastal swamp forests	2018	Mature Forest	81-100 %	Seen from edge of polygon	EarthScapes Ecologist: meets criteria.	0.90	
86	Paperbark+Rainforest	Coastal swamp forests	2021	Old Growth/excellent condition	81-100 %	Walk through	EarthScapes Ecologist: meets criteria.	5.82	
87	Paperbark+Rainforest	Coastal swamp forests	2017	Old Growth/excellent condition	51-80 %	Seen from edge of polygon	EarthScapes Ecologist: meets criteria.	4.84	
88	Paperbark	Coastal swamp forests	25/9/2014	Mature Forest	81-100 %	Distance assessment	EarthScapes Ecologist: meets criteria. Landowner confirmed.	2.67	
89	Paperbark	Coastal swamp forests		Mature Forest	51-80 %	No ground truthing	EarthScapes Ecologist: meets criteria. Landowner confirmed.	1.96	
90	Paperbark+Swamp Mahogany	Coastal swamp forests	2/12/2014	Mature Forest	51-80 %	Distance assessment	EarthScapes Ecologist: meets criteria.	0.65	
91	Paperbark+Swamp Mahogany, Swamp Box	Coastal swamp forests	2021	Mature Forest	81-100 %	Distance assessment	Byron Environment and Conservation Group: Add coastal wetlands	3.39	
92	Paperbark-Swamp Mahogany	Coastal swamp forests		Old Growth/excellent condition	81-100 %	No ground truthing	Byron Environment and Conservation Group: Add coastal wetlands	3.48	

93	Paperbark+Rainforest	Coastal swamp forests	2022	Mature Forest	51-80 %	Distance assessment	EarthScapes Ecologist: meets criteria.	3.17	
94	Paperbark	Coastal swamp forests	2019	Mature Forest	51-80 %	Walk through	EarthScapes Ecologist: meets criteria.	1.15	
95	Paperbark	Coastal swamp forests	2009, 2015	Mature Forest	81-100 %	Verification from other sources	EarthScapes Ecologist: meets criteria.	0.79	
96	Paperbark	Coastal swamp forests	2009	Mature Forest	81-100 %	Verification from other sources	EarthScapes Ecologist: meets criteria.	1.51	
97	Paperbark+Swamp Oak, Swamp Box, Rainforest	Coastal swamp forests	2009, 2015	Mature Forest	81-100 %	Verification from other sources	EarthScapes Ecologist: meets criteria.	2.73	
98	Paperbark+Swamp Mahogany	Coastal swamp forests		Mature Forest	51-80 %	No ground truthing	Byron Environment and Conservation Group: Add coastal wetlands	1.97	
99	Paperbark	Coastal swamp forests		Mature Forest	51-80 %	No ground truthing	Meets criteria. Connected.	0.11	
100	Paperbark+Camphor Laurel	Coastal swamp forests		Old Growth/excellent condition	81-100 %	No ground truthing	Connectivity to NP.	2.45	
101	Paperbark	Coastal swamp forests		Old Growth/excellent condition	81-100 %	No ground truthing	Connectivity to NP.	0.56	
102	Paperbark	Coastal swamp forests		Mature Forest	51-80 %	No ground truthing	Byron Environment and Conservation Group: Wetlands to be included. EarthScapes Ecologist: meets criteria. Connected.	0.63	
103	Paperbark	Coastal swamp forests	2021	Mature Forest	51-80 %	Walk through	EarthScapes Ecologist: meets criteria.	1.38	

104	Paperbark	Coastal swamp forests	2016	Old Growth/excellent condition	81-100 %	Walk through	EarthScapes Ecologist: meets criteria.	15.17	
105	Paperbark	Coastal swamp forests		Mature Forest	51-80 %	No ground truthing	EarthScapes Ecologist: meets criteria.	0.53	
106	Paperbark	Coastal swamp forests		Old Growth/excellent condition	51-80 %	No ground truthing	EarthScapes Ecologist: meets criteria. Connected.	1.33	
107	Riparian	Coastal Freshwater Lagoons				No ground truthing	JY DPI: Up Simpsons Creek there is a missing connection in the protection of the waterway and its banks as coastal wetland. Connection along waterways is important and further to the south coastal wetlands have been identified right up to the industrial.	2.41	
108	Tallowwood-Swamp Mahogany-Forest Red Gum	Coastal swamp forests	2020	Mature Forest	81-100 %	Walk through	JY DPI: floodplain wetland up Kings Creek. Byron Environment and Conservation Group: Add coastal wetlands. EarthScapes Ecologist: meets criteria.	1.08	
109	Swamp Mahogany+Forest Red Gum	Coastal swamp forests	2021	Old Growth/excellent condition	51-80 %	Distance assessment	JY DPI: floodplain wetland up Kings Creek. Byron Environment and Conservation Group: Add coastal	4.26	

							wetlands. EarthScapes Ecologist: meets criteria.		
110	Mangrove	Mangrove Swamp					JY DPI: Mangrove and Saltmarsh communities. EarthScapes Ecologist: meets criteria. Connected.	1.74	
111	Mangrove	Mangrove Swamp					JY DPI: Mangrove and Saltmarsh communities. EarthScapes Ecologist: meets criteria.	3.26	
112	Mangrove	Mangrove Swamp					JY DPI: Mangrove and Saltmarsh communities. EarthScapes Ecologist: meets criteria. Connected.	0.35	
113	Mangrove	Mangrove Swamp					JY DPI: Mangrove and Saltmarsh communities. EarthScapes Ecologist: meets criteria. Connected.	0.23	
114	Mangrove	Mangrove Swamp					JY DPI: floodplain wetland up Kings Creek. EarthScapes Ecologist: meets criteria.	0.35	
115	Paperbark	Mangrove Swamp		Mature Forest	51-80 %	No ground truthing	EarthScapes Ecologist: meets criteria. Remove gardens.	0.50	
116	Paperbark	Coastal swamp forests	2018	Mature Forest	51-80 %	Walk through	EarthScapes Ecologist: meets criteria. Connected.	0.45	

117	Paperbark	Coastal swamp forests	2014	Mature Forest	81-100 %	Seen from edge of polygon	Byron Environment and Conservation Group: coastal wetlands to be included. EarthScapes Ecologist: meets criteria. Connected.	0.17	
118	Swamp Oak + Paperbark+Rainforest	Coastal swamp forests	2015	Mature Forest	81-100 %	Seen from edge of polygon	Byron Environment and Conservation Group: coastal wetlands to be included. EarthScapes Ecologist: meets criteria. Connected.	0.21	
119	Paperbark + Swamp Oak	Coastal swamp forests	2023	Mature Forest	81-100 %	Seen from edge of polygon	EarthScapes Ecologist: meets criteria. Connected.	1.09	
121	Paperbark	Coastal swamp forests	2023	Mature Forest	81-100 %	Walk through	Byron Environment and Conservation Group: Wetlands to be included. EarthScapes Ecologist: meets criteria. Connected.	0.71	
122	Paperbark	Coastal swamp forests		Old Growth/excellent condition	81-100 %	No ground truthing	EarthScapes Ecologist: meets criteria. Connected.	0.14	
123	Paperbark	Coastal swamp forests	2017	Mature Forest	81-100 %	Seen from edge of polygon	Byron Environment and Conservation Group: coastal wetlands to include. EarthScapes Ecologist: meets criteria. Connected.	0.11	
124	Paperbark	Coastal swamp forests	2017	Mature Forest	81-100 %	Seen from edge of polygon	Byron Environment and Conservation Group: coastal	0.11	

							wetlands to include. EarthScapes Ecologist: meets criteria. Connected.		
125	Paperbark	Coastal swamp forests		Mature Forest	81-100 %	Distance assessment	EarthScapes Ecologist: meets criteria. Connected.	0.22	
126	Paperbark	Coastal swamp forests	2014	Mature Forest	81-100 %	Seen from edge of polygon	Byron Environment and Conservation Group: coastal wetlands to be included. EarthScapes Ecologist: meets criteria. Connected.	0.02	
127	Paperbark-Brush Box-Swamp Oak	Coastal swamp forests		Mature Forest	51-80 %	No ground truthing	Byron Environment and Conservation Group: coastal wetlands to be included. EarthScapes Ecologist: meets criteria. Connected.	0.03	
128	Paperbark	Coastal swamp forests					Cape Byron Veg mapping. Paperbark forest.	2.14	Y
129	Paperbark+Swamp Box, Swamp Mahogany	Coastal swamp forests	2018	Mature Forest	51-80 %	Seen from edge of polygon	Byron Environment and Conservation Group: Wetlands to be included. EarthScapes Ecologist: meets criteria.	2.77	
130	Swamp Oak	Coastal Floodplain forests					From Cape Byron Veg Mapping. Connected..	0.01	Y
131	Paperbark+Swamp Box, Swamp Mahogany	Coastal swamp forests					From Cape Byron Veg Mapping. Broadleaved Paperbark Swamp	0.10	Y

							Sclerophyll Forest. Connected.		
132	Common reed, rushland	Coastal Freshwater Lagoons					From Cape Byron Veg Mapping. Norm NP - Reed/Coperbark	0.55	Y
133	Common reed, rushland	Coastal Freshwater Lagoons					From Cape Byron Veg Mapping. Common Reed Rushland	0.08	Y
134	Common reed, rushland	Coastal Freshwater Lagoons					From Cape Byron Veg Mapping. Common Reed Rushland	0.11	Y
135	Paperbark	Coastal swamp forests					From Cape Byron Veg Mapping. Broadleaved Paperbark Swamp Sclerophyll Forest	1.20	Y
136	Paperbark	Coastal swamp forests					From Cape Byron Veg Mapping. Broadleaved Paperbark Swamp Sclerophyll Forest	2.89	Y
137	Paperbark	Coastal swamp forests					From Cape Byron Veg Mapping. Broadleaved Paperbark Swamp Sclerophyll Forest	0.93	Y
138	Paperbark	Coastal swamp forests					From Cape Byron Veg Mapping. Broadleaved Paperbark Swamp Sclerophyll Forest. Connected.	0.46	Y
139	Paperbark	Coastal swamp forests					From Cape Byron Veg Mapping. Broadleaved Paperbark Swamp Sclerophyll Forest.	0.33	Y

							Connected.		
140	Paperbark	Coastal swamp forests					From Cape Byron Veg Mapping. Broadleaved Paperbark Swamp Sclerophyll Forest. Connected.	0.40	Y
141	Paperbark	Coastal swamp forests					From Cape Byron Veg Mapping. Broadleaved Paperbark Swamp Sclerophyll Forest	0.73	Y
142	Swamp Oak	Coastal Floodplain forests					From Cape Byron Veg Mapping. Swamp Oak Dry Sclerophyll Forest on Headlands. Connected.	0.13	Y
143	Swamp Oak	Coastal Floodplain forests					From Cape Byron Veg Mapping. Swamp Oak Dry Sclerophyll Forest on Headlands. Connected.	0.10	Y
144	Swamp Oak	Coastal Floodplain forests					From Cape Byron Veg Mapping. Swamp Oak Dry Sclerophyll Forest on Headlands. Connected.	0.07	Y
145	Paperbark-Swamp Mahogany	Coastal swamp forests	2016	Mature Forest	51-80 %	Seen from edge of polygon	Byron Environment and Conservation Group: coastal wetlands to be included. EarthScapes Ecologist: meets criteria. Connected.	0.86	

146	Paperbark	Coastal swamp forests	2019	Old Growth/excellent condition	51-80 %	Walk through	EarthScapes Ecologist: meets criteria	1.08	
147	Paperbark-Rainforest	Coastal swamp forests	2015	Mature Forest	51-80 %	No ground truthing	EarthScapes Ecologist: meets criteria. Connected.	0.46	
148	Paperbark	Coastal swamp forests	2016	Old Growth/excellent condition	81-100 %	Walk through	EarthScapes Ecologist: meets criteria	11.75	
149	Paperbark+Rainforest	Coastal swamp forests		Old Growth/excellent condition	51-80 %	Seen from edge of polygon	EarthScapes Ecologist: meets criteria. Connected.	1.02	
150	Paperbark	Coastal swamp forests		Mature Forest	51-80 %	No ground truthing	Connectivity to NP.	1.03	