Assessment of Threatened Ecological Communities of the Coastal Integrated Forestry Operations Approval Region

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Environment Protection Authority

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1 Introduction

1.1 Project rationale

This project was initiated by the NSW Environment Protection Authority (EPA) and the Forestry Corporation of NSW (FCNSW) to support improved recognition, regulation and management of Threatened Ecological Communities (TECs) in NSW native forestry. It represents a coordinated approach to resolve long standing issues surrounding the identification, extent and location of priority TECs that occur on the NSW State Forest estate included within eastern Regional Forest Agreements.

The TEC mapping project aimed to:

- Identifying those TECs most likely to be present in harvest areas and impacted by forestry activities
- Develop an agreed interpretation of each threatened entity in consideration of diagnostic and supplementary information and evidence contained in the final determination of the NSW Scientific Committee
- Develop a methodology to identify, classify and map TECs on State Forests within a defined study area
- Establish regulatory boundaries around TEC management units at an appropriate scale (1:4000) for use in planning and operations

1.2 Funding

The TEC Mapping Project is part of a broader suite of projects being undertaken by the EPA, and is complementary to the current coastal Integrated Forestry Operations Approval review.

The TEC Mapping Project was funded by a Waste and Environment Levy Envelope grant and is administered by the NSW Environmental Trust. An amount of $1,270,000 was available over a 3-year funding period to implement the Project. The Project commenced in 2014 and was completed in August 2016 (see figure 1)

1.3 The project team

The project was planned and implemented under the oversight of the Director, Forestry Branch. An EPA project manager coordinated TEC related strategic planning and policy matters, end-product use, and all aspects of communication, stakeholder engagement and reporting.

The Office of Environment (OEH) and Heritage Native Vegetation Information Science Branch was contracted to deliver all scientific, analytical, methodological and mapping aspects of the TEC mapping project. A dedicated OEH project team consisting of a senior vegetation scientist (vegetation survey, classification and mapping), a senior scientist (GIS and spatial analysis) and a vegetation scientist (aerial photograph interpretation) was recruited to implement the project under the coordination of the Senior Team Leader Vegetation Ecology and Classification.

Independent specialist consultancies were also engaged to deliver key aspects of the work including botanical survey, aerial photograph interpretation, GIS and spatial analysis, data entry and management. These contributors are listed at Appendix C.

1.4 The TEC Project Reference Panel

The EPA convened a TEC Project Reference Panel (TEC Panel), of regional experts to guide and oversee the legal and ecological interpretation of TEC final determinations, to provide technical input on methodologies, analysis and mapping pathways and to review outputs.

The Panel included representatives from the EPA, OEH, FCNSW, the NSW Scientific Committee and regional experts. The Panel operated under a terms of reference and established principles agreed to by project partners. Over the course of the Project, 13 Panel sessions were held.

The principles assumed by the TEC Panel have ensured that the TEC interpretations are, as far as practicable, consistent with relevant final determinations. The core inputs of the Panel in relation to individual TECs are noted in the associated technical reports.

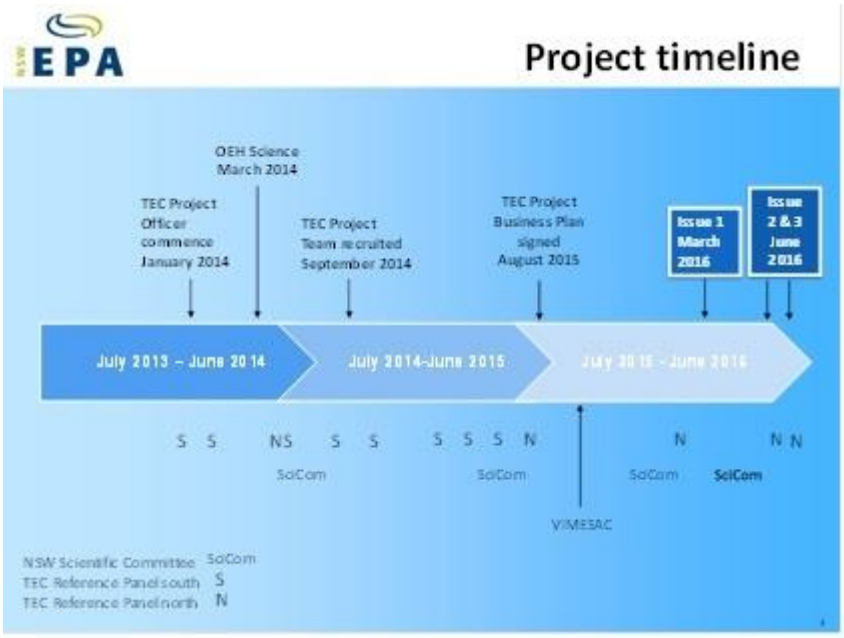

Figure 1: Project timeline

1.5 NSW Scientific Committee

The EPA and project team have engaged with the NSW Scientific Committee on a regular basis throughout the Project; providing updates on key findings and in relation to issues encountered in interpreting final determinations. A sitting member of the NSW Scientific Committee has attended most TEC Panel sessions. The project outputs have been submitted to the NSW Scientific Committee.

1.6 Vegetation Information and Mapping Scientific Advisory Committee

The TEC interpretation principles, classification and mapping methods were presented to VIMESAC, the OEH independent vegetation information and mapping scientific advisory committee.

2 Assessment area

2.1 State Forest areas

The Project Study Area includes all Crown Forest estate situated within the boundaries of the Upper North East, Lower North East, Southern and Eden Integrated Forestry Operations Approval (IFOA) regions. A total of 315 state forests were included in this assessment and are listed at Appendix A, and shown in figures 2 and 3. Additionally, Crown Forests situated within the Central Tablelands area comprising part of the Bathurst and Mudgee forest management areas are also included in the Study Area. These forests are not covered by an IFOA but are identified for assessment for the purposes of this project.

Table 1: State Forests by IFOA region

IFOA Region	Area (Hectares)	Proportion of all State Forest in Study Area
Eden	164146	12%
Southern	281907	20%
Lower North-East	472381	34%
Upper North-East	414570	29%
Non IFOA (central NSW)	70561	5%
Total	1403565	

2.2 Exclusions

Figures 2 and 3 also illustrate areas that are not subject to this assessment. These include those areas defined as Forest Management Zones 5 (Hardwood Plantations) and Zone 6 (Softwood Plantations). Small areas of native forest wholly enclosed or adjoining Forest Management Zone 6 (Softwoods) are also excluded from assessment as they are considered to be outside of the authority of the IFOA.

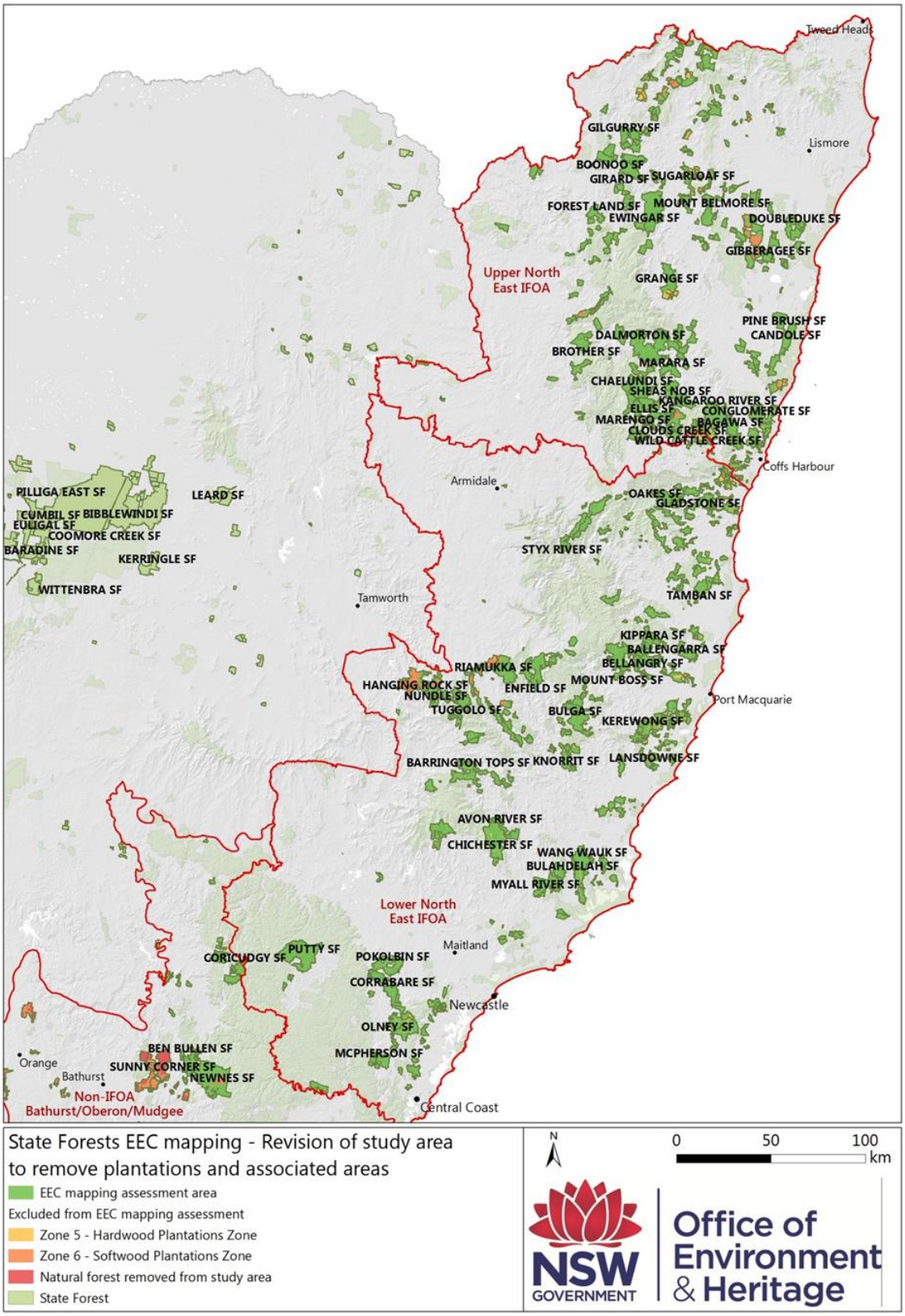

Figure 2: Northern NSW IFOA Regions

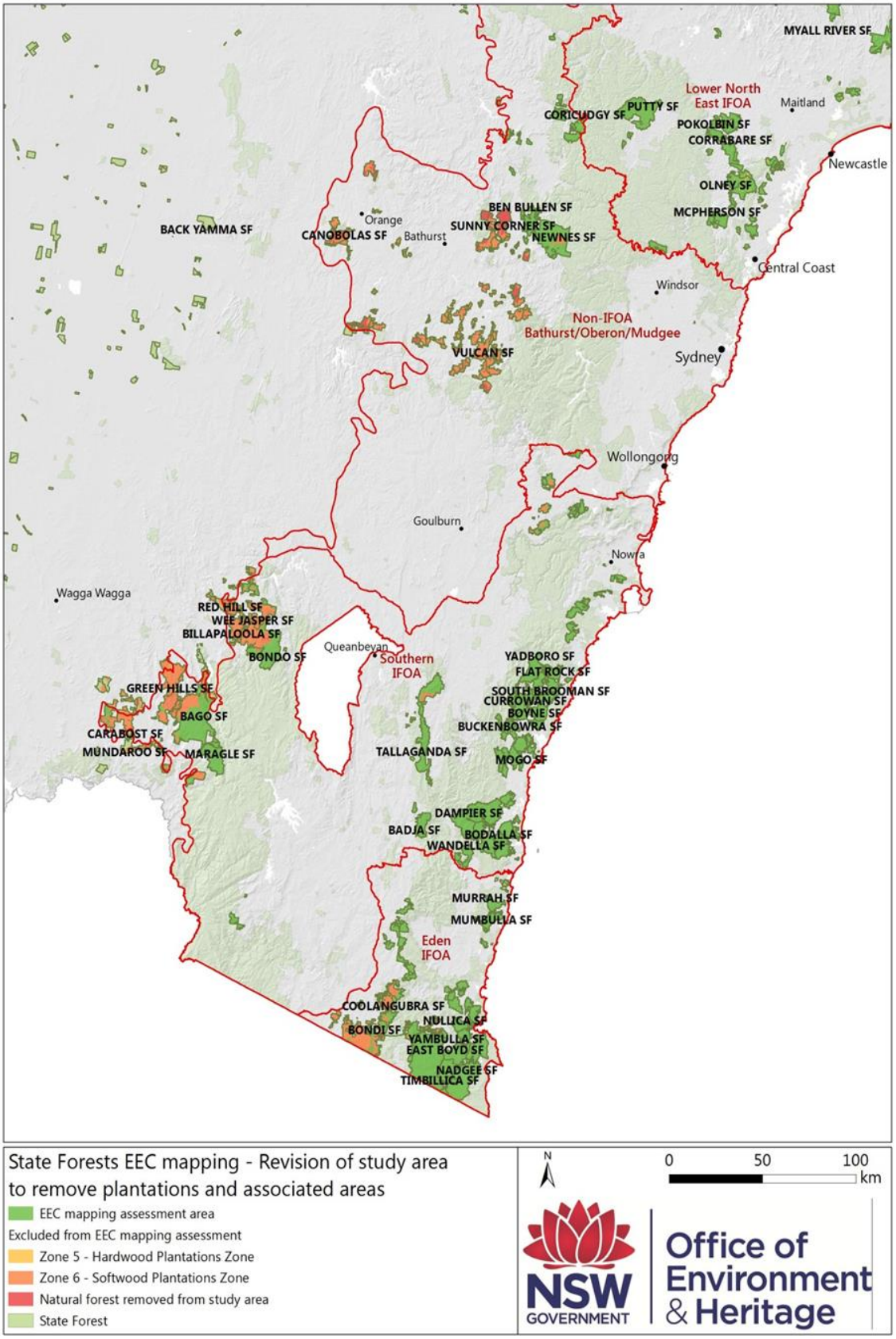

Figure 3: Southern NSW IFOA Regions

3 Assessed TECs

3.1 Prioritisation process

The EPA and FCNSW identified a priority list of TECs to be assessed against a prescribed set of criteria that weights the relative priority of each of the 103 TECs listed under the *NSW Threatened Species Conservation Act, 1995* (Appendix B).

This prioritisation process was initiated to ensure that investment and available resource was directed to the TECs most likely to be impacted by forestry activities within the Study Area.

A range of factors were considered in ranking the TECs for mapping and interpretation. These include but are not limited to:

- conservation status of the TEC under State and Federal Acts
- the known extent of the TEC within harvestable areas and on other tenures
- the degree to which TEC is protected by existing measures such as IFOA prescriptions or Forests NSW Forest Management Zones (FMZs) or exclusions zones
- potential impacts or threat from forestry activities as referenced in the final determination i.e. if forestry activities are listed, known or predicted to be a primary or contributing threat, or, are implied to cause indirect impacts such as fragmentation, removal of debris or loss of hollows
- the inclusion of species within the TEC identified by FCNSW as a priority for timber supply purposes or a commercial value forest type
- regulatory history

Twenty-five TECs deemed to be most at risk from forestry activities were identified as likely to occur on Crown Forest within the study area. These are listed in table 2, and include those TECs most frequently presenting regulatory challenges in the forestry context.

The effort and time required to confidently map each TEC at the commencement of the Project was unknown, and would vary according to the methods applied. Consequently, the number of TECs that could be mapped within the Project term was also unknown. In light of this uncertainty, the work schedule of the mapping team was largely guided by the outcomes of this risk assessment process. However, in the interests of maximising efficiencies, the priority TECs in Table 2 were assessed in groups that were floristically and environmentally related. For example, floodplain (6) and rainforest (3) TECs were assessed in sets, and the study area was partitioned into north coast, south coast and tableland focus areas.

During the course of the Project a number of priority TECs were nominated for review by the NSW Scientific Committee. Where assessment had not already commenced, these TECs were relegated in the priority list pending advice from the NSW Scientific Committee.

On this basis, assessment and mapping continued through to project close at 30 June 2016. This resulted in 18 of the 25 prioritised TECs being assessed as indicated in Table 2.

Abbreviated NSW TEC Name	IFOA Area	Priority	Assessed
Riverflat Eucalypt Forest on Floodplains	Southern, UNE, LNE	High	Y
Subtropical coastal floodplain forest	UNE, LNE	High	Y
Swamp Sclerophyll Forest on coastal Floodplains	Southern, UNE, LNE	High	Y
Lowland Rainforest on Floodplain	UNE, LNE	High	Y
Lowland Rainforest	UNE, LNE	High	Y
Lower Hunter Spotted Gum Ironbark forest	LNE	High	N review

Grey Box - Grey Gum wet sclerophyll forest	UNE, LNE	High	Y
Lowland Grassy Woodland	Eden, Southern	High	Y
White Gum Moist Forest	UNE, LNE	High	Y
Montane Peats and Swamps	Southern, Eden, UNE, LNE	High	Y
Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland	Southern and Eden and Non-IFOA areas	Moderate	Y
Ribbon Gum-Mountain Gum-Snow Gum Grassy Woodland	UNE, LNE	Moderate	N Tablelands group
White box yellow box Blakely's red gum woodland	Southern, UNE, LNE and Non-IFOA areas	Moderate	N Tablelands group
Bangalay Sand Forest	Eden, Southern	Moderate	Y
New England Peppermint Woodland on basalts and sediments	UNE, LNE	Moderate	N Tablelands group
McKies Stringybark/Blackbutt Open Forest	UNE, LNE	Moderate	Y
Brogo Wet Vine Forest	Eden, Southern	Moderate	Y
Swamp Oak Floodplain Forest	Southern, Eden, UNE, LNE	Moderate	Y
Littoral Rainforest	Southern, UNE, LNE	Moderate	Y (north) N (south)
Coastal Saltmarsh on floodplains	Southern, Eden, UNE, LNE	Low	Y
Milton Ulladulla Subtropical Rainforest	Southern	Low	Y
Dry Rainforest of the South East Forests	Eden, Southern	Low	Y
Tablelands Basalt Forest	Southern	Low	N Tablelands group

Table 2: NSW TECs prioritised for assessment

3.2 Commonwealth EPBC Act Listings

Forestry operations undertaken in accordance with a Regional Forest Agreement (RFA) are exempt from part 3 of the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999*.

The Federally listed TECs shown in Table 3 were included as separate priority entities, as they relate to prioritised State listed TECs, and are likely to occur outside of gazetted RFA regions (North East, Eden, Southern), but within the previously defined Project Study Area. Although included in the priority TEC assessment list, these tableland TECs were not among the 18 TECs we mapped during the project term.

There are other federally listed TECs that relate in whole or part to the priority State listed TECs in Table 2, however, we did not specifically consider the relevant federal determinations and listing criteria due to the part 3 exemption.

Commonwealth TEC Name	IFOA Area	Priority
Upland Basalt Eucalypt Forest of the Sydney Basin	Non IFOA areas	Low
White box yellow box Blakely's red gum woodland	Southern, UNE, LNE and Non IFOA areas	Moderate

Table 3: Commonwealth TECs prioritised for assessment

3.3 Additional listed TECs

Since the commencement of the TEC Mapping Project in 2014, the NSW and Commonwealth Scientific Committees have listed new TECs and made amendments to existing final determinations. When an amendment to an assessed TEC determination occurs, the EPA will review the regulatory interpretation and consider potential revisions to operational maps and field based identification tools. The timing of any map reviews will be influenced by EPA resourcing and corporate priorities.

4 Defining TECs

4.1 The final determinations of the NSW Scientific Committee

The final determinations of the NSW Scientific Committee are the primary source of information underpinning interpretations of each threatened entity assessed under this project.

Under the NSW TSC Act, TECs are defined as an assemblage of species in an area. The NSW Scientific Committee uses IBRA bioregions as the primary spatial unit to define an area. Determinations contain a range of descriptors, lists and statements that define the floristic, structural, environmental and distributional attributes of a TEC.

Guided by a set of interpretation principles, uncertainty around the meaning or intent of particular statements in any determination was resolved by the TEC Project Reference Panel.

4.2 TEC Project Reference Panel Interpretations

The TEC Project Reference Panel provided technical advice on the defining attributes of a TEC that satisfy the criteria described in the final determination. Resolutions of this Panel informed operational interpretations of each of the assessed TECs for the purpose of mapping and/or guiding field identification for forestry operations.

The Panel considered a range of different factors that define each TEC. These included, but were not limited to:

- Defined biophysical areas including bioregional boundaries
- Species lists and floristic composition
- Habitat descriptors
- Structural descriptors
- References to existing vegetation classification sources developed using traceable quantitative data
- Precise wording of location descriptors and administrative boundaries

The TEC Panel also provided guidance on the classification sources underpinning TEC determinations, and whether alternate interpretation and/or mapping methods were appropriate for individual TECs.

The assessed TECs were grouped by broad assessment class, see Table 4.

Table 4: TEC broad assessment class

Broad TEC assessment class	Defining TEC characteristics
Canopy driven	The determination contains absolute statements describing the dominance of a species or combination of species in the upper stratum (eg White gum moist forest)
Structural	The determination contains a complex aggregation of plant assemblages each of which are united by shared structural attributes. These structural attributes occupy distinctive habitats that can readily be distinguished from other assemblages both in the field and using remotely sensed imagery. Mapping of the structural patterns encompasses all relevant species compositional attributes of TECs. (eg Bogs and Saltmarshes)
Assemblage driven	TECs derived from classification sources using plot based classification methods. Traceable plot assignments form the basis of defining interpretation of TECs

All existing data relevant to the development of an operational definition of each TEC was identified, compiled and assessed by the project team. The type of data includes (but is not limited to):

- vegetation classifications cited in TEC final determinations and any primary systematic data used to define them
- vegetation map units cited in TEC final determinations and their mapped distribution
- species locality records cited as characteristic or indicative of a TEC
- environmental data that may prescribe or indicate the distribution of a TEC
- existing interpretation of TEC and plant community type relationships held by OEH vegetation information databases for regulatory applications.

In consideration of Panel advice, relevant case law and after consultation with project partners, the EPA endorsed each interpretation, allowing mapping to proceed.

5 Project products

5.1 Outputs

The broad outputs of this Project are:

- TEC Certified Map(s): High resolution operational maps of priority TEC extent on Crown Forestry lands (as described in 5.3)
- TEC Indicative Maps(s): Maps of priority TEC distribution on public and some private tenure lands (as described in 5.4)
- TEC field guidelines: Guidance to support identification of a subset of priority unmapped TECs (as described in 5.5)
- Technical reports: A full description of the assessment undertaken for each TEC

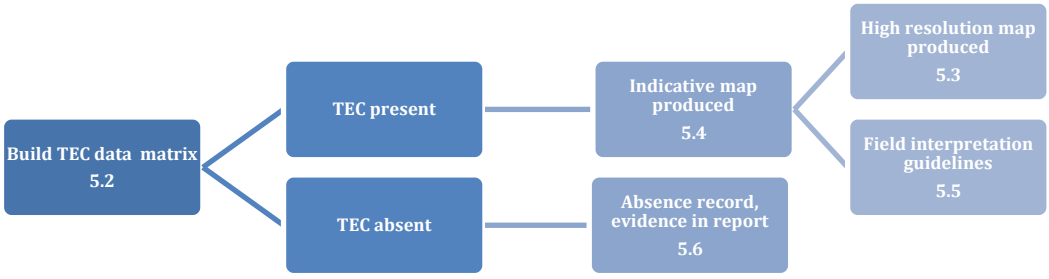

Figure 4: TEC assessment pathway

5.2 NSW state forest-TEC Data Matrix

The TEC-Forest data matrix identifies the presence or absence of each mapped and/or assessed TEC, for each state forest across the Study Area.

The matrix forms the primary information source that identifies which TECs apply to each individual state forest. The data used to generate the matrix has been drawn from the approved mapped outputs and interpretations developed by this project with reference to final determinations. This process and decision pathway is documented in the technical reports.

5.3 Operational Mapping

A set of 13 high-resolution digital maps, have been developed that describe the distribution of each assessed TEC as it occurs on the state forest estate.

Operational maps identify native vegetation cover that meets the agreed EPA interpretation of current TEC final determinations. The maps have been produced at a scale, appropriate for use in harvest planning and forest management operations (typically 1:4000). Harvest planning maps are typically drafted at a scale of 1:15 000.

These maps represent the application of mapping methods including aerial photograph interpretation, field observations including systematically collected plot data and predictive statistical models applied in various combinations depending on the TEC.

5.4 Indicative TEC Mapping

Indicative maps were generated from statistical models that predicted TEC distributions. Individual TEC models were constructed using a large plot-based dataset with individual plots

assigned to one of two classes, TEC or non-TEC. These plots were used to discriminate which parts of the landscape were likely to be occupied by the TEC and which were not, with values describing the probability of occurrence assigned to the landscape in its entirety. Predictions are limited by the scale of the environmental data used in the models. As a result, some models offer insights into distribution trends rather than resolving local scale patterns with certainty. Indicative maps were adopted where alternate mapping methods were unable to achieve levels of reliability suitable for operational applications.

Two of the assessed TECs are presented solely as indicative maps, and a third TEC has a portion of its distribution remaining as indicative pending further investigation. Indicative maps trigger the application of a field guide key (see 5.5). This process and decision pathway is documented and included in the technical reports.

5.5 Field Guide Interpretation guidelines

Field interpretation guidelines have been produced for some TECs to support the delineation of TECs for on ground operations, where an operational map has not been produced. The guidelines draw on systematically collected field data and analysis to identify characteristic species, vegetation structure and landform elements. Key attributes that can be used to separate TECs from related plant community types have also be provided. Where developed, the field guide keys are included in the technical reports.

5.6 Technical Reports

Technical reports have been produced for each assessed TEC that address the following:

- TEC Panel interpretation
- survey design and data collection
- data analysis and diagnostic information
- mapping methods and results
- primary sample data assigned to the TEC
- mapping accuracy
- field interpretation guidelines (where relevant)
- TEC Project reference panel review

5.7 Floristic data (systematic, non-systematic)

The derivation of TEC maps has relied heavily on quantitative evidence collected in the field as well as existing data stored in the OEH NSW Vegetation Information System. The adequacy of existing survey effort across all state forests was assessed for each TEC prior to any new work commencing.

Field survey data was collected using OEH survey standards for systematic flora survey (Sivertsen, 2009) and has been entered and stored in the OEH NSW Vegetation Information System (VIS). This reference data provides traceable evidence of the presence of TECs on state forest estate and offers a basis for interpretation of TEC final determinations.

Systematic field data was supplemented by rapid field observations to assist the mapping process. Rapid observations recorded a subset of the OEH survey standards in order to facilitate a greater coverage of area within resource constraints.

Systematically collected data was subject to objective and transparent analytical techniques to understand relationships between a TEC, sample data and existing vegetation community classifications. These analyses and field data were used to construct predictive maps, undertake aerial photograph interpretation and to build field identification keys.

The TEC assessments were guided by over 9000 observation points in state forest, including 845 additional full floristic plots collected specifically for this project, (a 30% increase in available systematic data on state forest)

6 Results

Notwithstanding the inherent difficulties in interpreting TECs and defining operational boundaries, we believe the adoption of a precautionary approach has resulted in inclusive operational definitions that minimise the risk that candidate TECs have been overlooked on state forest. The Project has reduced uncertainty around the identification of the assessed TECs, and provided a comprehensive evaluation, that has generated a significant body of evidence that will support the EPA to administer the objects of the *TSC Act* concerning these entities. Final areas mapped for each TEC assessed are summarised in table 5. Please refer to individual technical reports for further detail.

Table 5: Final areas mapped for assessed TECs

Threatened Ecological Community	Operational map	Indicative map	Key	Area (Ha)
River flat eucalypt forest (south)	Y		Y	3819
River flat eucalypt forest (north)			N	198
Swamp sclerophyll forest (south)	Y		Y	32
Swamp sclerophyll forest (north)	Y		N	1099
Swamp oak floodplain forest (south)	Y		N	80
Swamp oak floodplain forest (north)	Y		N	204
Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland	Y		Y	902
Montane peatlands and swamps	Y		N	
Coastal saltmarsh	Y		N	99
Bangalay sand forest	Confirm absent		N	
Subtropical coastal floodplain forest	Y		Y	11050
Grey box grey gum wet sclerophyll forest	Y	Y	Y	2936
Lowland rainforest on floodplain	Y		N	683
Lowland rainforest	Y		N	14036
Littoral rainforest	Confirm absent*		N	
Lowland grassy woodland	NA	Y	Y	1535
Brogo wet vine forest			N	17
Dry rainforest of the south east forests			N	0.5
McKies Stringybark/Blackbutt Open Forest			N	201
White gum moist forest	NA	Y	Y	980
Milton Ulladulla subtropical rainforest			N	0

*confirmed absent from northern study area, southern rainforest mapping underway in southern study area

7 Information Management

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Mapping and reports are be available through the EPA website www.epa.nsw.gov.au/vegetation/nativeforestry. Please contact the EPA Forestry Branch forestry@epa.nsw.gov.au, for further information on any of the project materials.

8 Certification of products

I certify the mapping arising out of the TEC Mapping Project for public release and for use by the EPA Forestry Branch in supporting the regulation of specified forestry activities from the assigned date.

……
Mark Gifford
Chief Environmental Regulator, Environment Protection Authority

Date:

Appendix A: List of state forests assessed under the TEC mapping project (Area in Ha)

Eden IFOA	**164146**
Bermagui State Forest	1863
Bombala State Forest	339
Bondi State Forest	6437
Broadwater State Forest	168
Bruces Creek State Forest	793
Cathcart State Forest	1739
Coolangubra State Forest	1870
East Boyd State Forest	21070
Glen Allen State Forest	1467
Glenbog State Forest	8780
Gnupa State Forest	1321
Mumbulla State Forest	6147
Murrah State Forest	4221
Nadgee State Forest	20603
Nalbaugh State Forest	2275
Nullica State Forest	18344
Nungatta State Forest	889
Tanja State Forest	868
Tantawangalo State Forest	3404
Timbillica State Forest	9173
Towamba State Forest	1435
Wandella State Forest	0
Yambulla State Forest	46883
Yurammie State Forest	4059
Lower North East IFOA	472381
Aberdare State Forest	6
Avon River State Forest	5094
Awaba State Forest	1784
Bachelor State Forest	2642
Ballengarra State Forest	6310
Barrington Tops State Forest	12588
Bellangry State Forest	6411
Ben Halls Gap State Forest	351
Boonanghi State Forest	3817
Bowman State Forest	3187

Brassey State Forest	745
Bril Bril State Forest	2364
Broken Bago State Forest	4042
Buckra Bendinni State Forest	1766
Bulahdelah State Forest	8468
Bulga State Forest	14679
Bulls Ground State Forest	2217
Burrawan State Forest	2322
Cairncross State Forest	5875
Carrai State Forest	3028
Chichester State Forest	21387
Cochrane State Forest	231
Collombatti State Forest	4136
Comboyne State Forest	3080
Comleroy State Forest	2904
Coneac State Forest	777
Coopernook State Forest	874
Coricudgy State Forest	0
Corrabare State Forest	5197
Cowarra State Forest	1687
Diehappy State Forest	1275
Dingo State Forest	3874
Dorrigo State Forest	0
Doyles River State Forest	7795
Dyke State Forest	6
Enfield State Forest	13105
Enmore State Forest	169
Fosterton State Forest	851
Giro State Forest	9934
Gladstone State Forest	6781
Heaton State Forest	2426
Ingalba State Forest	6894
Irishman State Forest	2733
Johns River State Forest	1265
Kalateenee State Forest	1346
Kendall State Forest	354
Kerewong State Forest	4021

Kew State Forest	909
Kippara State Forest	5632
Kiwarrak State Forest	6707
Knorrit State Forest	5175
Lansdowne State Forest	4610
Little Newry State Forest	194
Lorne State Forest	4062
Lower Creek State Forest	1270
Maria River State Forest	2097
Masseys Creek State Forest	3237
Mcpherson State Forest	6488
Medowie State Forest	50
Mernot State Forest	4338
Middle Brother State Forest	2188
Mistake State Forest	5638
Moonpar State Forest	2
Mount Boss State Forest	17165
Mount Seaview State Forest	1
Muldiva State Forest	515
Muswellbrook State Forest	2
Myall River State Forest	13713
Nambucca State Forest	1677
Nerong State Forest	2173
Never Never State Forest	100
Newry State Forest	3926
North Branch State Forest	863
Nowendoc State Forest	3810
Nulla-five Day State Forest	3370
Nundle State Forest	6811
Oakes State Forest	7639
Old Station State Forest	230
Olney State Forest	18741
Orara West State Forest	0
Ourimbah State Forest	3571
Pappinbarra State Forest	1181
Pee Dee State Forest	62
Pine Creek State Forest	2105
Pokolbin State Forest	14030
Putty State Forest	22252
Queens Lake State Forest	627
Ravensworth State Forest	901

Riamukka State Forest	12520
Roses Creek State Forest	1790
Scotchman State Forest	4230
Skillion Flat State Forest	5
Stewarts Brook State Forest	2417
Strickland State Forest	485
Styx River State Forest	17427
Tamban State Forest	7681
Tarkeeth State Forest	1423
Terrible Billy State Forest	1090
Thumb Creek State Forest	3944
Tomalla State Forest	2107
Tuckers Nob State Forest	3635
Tuggolo State Forest	14065
Uffington State Forest	325
Upsalls Creek State Forest	978
Viewmont State Forest	890
Wallaroo State Forest	3595
Wallingat State Forest	1240
Wang Wauk State Forest	8356
Watagan State Forest	3890
Way Way State Forest	1307
Wild Cattle Creek State Forest	4440
Wyong State Forest	726
Yango State Forest	684
Yarratt State Forest	2381
Yessabah State Forest	1887
Non-IFOA Bathurst/Mudgee	70561
Airly State Forest	632
Ben Bullen State Forest	8252
Bylong State Forest	621
Canobolas State Forest	514
Clandulla State Forest	1561
Coricudgy State Forest	7581
Cumberland State Forest	40
Dungeree State Forest	370
Falnash State Forest	398
Gurnang State Forest	961
Hampton State Forest	2518
Jellore State Forest	1
Kandos State Forest	1396

Lidsdale State Forest	849
Mount David State Forest	871
Mullions Range State Forest	1528
Newnes State Forest	22401
Nullo Mountain State Forest	5370
Pennsylvania State Forest	2752
Roseberg State Forest	958
Sunny Corner State Forest	7635
Tongo State Forest	270
Turon State Forest	1878
Wolgan State Forest	1205
Southern IFOA	281907
Badja State Forest	7695
Bago State Forest	34426
Bateman State Forest	1
Belanglo State Forest	2822
Benandarah State Forest	2760
Bodalla State Forest	24098
Bolaro State Forest	1779
Bondo State Forest	16200
Boyne State Forest	6160
Buckenbowra State Forest	5192
Bungongo State Forest	2696
Carabost State Forest	2478
Clyde State Forest	3586
Corunna State Forest	184
Currambene State Forest	1693
Currowan State Forest	11974
Dampier State Forest	33766
Flat Rock State Forest	4893
Green Hills State Forest	858
Ingebirah State Forest	2653
Jellore State Forest	1407
Jerrawangala State Forest	268
Kioloa State Forest	171
Mannus State Forest	396
Maragle State Forest	13991
Mcdonald State Forest	3681
Meryla State Forest	4232
Micalong State Forest	3175
Mogo State Forest	15499

Moruya State Forest	4060
Mowamba State Forest	162
Mundaroo State Forest	0
North Brooman State Forest	3630
Nowra State Forest	520
Shallow Crossing State Forest	3854
Shoalhaven State Forest	104
South Brooman State Forest	5585
Tallaganda State Forest	23910
Termeil State Forest	697
Tomerong State Forest	212
Wandella State Forest	5497
Wandera State Forest	5199
Wingello State Forest	2211
Woodburn State Forest	10
Yadboro State Forest	10745
Yarrawa State Forest	179
Yerriyong State Forest	6598
Upper North East IFOA	414570
Bagawa State Forest	5384
Bald Knob State Forest	1695
Banyabba State Forest	2682
Barcoongere State Forest	822
Beaury State Forest	7709
Billilimbra State Forest	3853
Boambee State Forest	873
Bom State Forest	872
Bonalbo State Forest	2675
Bookookoorara State Forest	915
Boonoo State Forest	4293
Boorabee State Forest	1090
Boorook State Forest	2990
Boundary Creek State Forest	2539
Braemar State Forest	2002
Brother State Forest	6539
Bungabbee State Forest	1097
Bungawalbin State Forest	1204
Butterleaf State Forest	1748
Camira State Forest	4007
Candole State Forest	6574
Carwong State Forest	603

Chaelundi State Forest	18238
Cherry Tree State Forest	1636
Cherry Tree West State Forest	321
Clouds Creek State Forest	10793
Coffs Harbour State Forest	3
Conglomerate State Forest	5685
Curramore State Forest	84
Dalmorton State Forest	27937
Devils Pulpit State Forest	1484
Divines State Forest	1524
Donaldson State Forest	2331
Donnybrook State Forest	2926
Doublebuke State Forest	5824
Eden Creek State Forest	1175
Edinburgh Castle State Forest	949
Ellangowan State Forest	1179
Ellis State Forest	9736
Ewingar State Forest	18433
Forest Land State Forest	8159
Fullers State Forest	1053
Gibberagee State Forest	10539
Gibraltar Range State Forest	3024
Gilgurry State Forest	9531
Girard State Forest	18851
Glen Elgin State Forest	683
Glenugie State Forest	4952
Grange State Forest	10608
Gundar State Forest	119
Hyland State Forest	4936
Kangaroo River State Forest	11423
Keybarbin State Forest	3707
Koreelah State Forest	1231
Legume State Forest	2
Little Spirabo State Forest	15
London Bridge State Forest	118
Lower Bucca State Forest	2828
Malara State Forest	3352
Marara State Forest	5351
Marengo State Forest	10128
Moogem State Forest	1284
Moonpar State Forest	2472

Mororo State Forest	379
Mount Belmore State Forest	9181
Mount Lindesay State Forest	3046
Mount Marsh State Forest	3636
Mount Mitchell State Forest	2304
Mount Pikapene State Forest	504
Mount Topper State Forest	261
Muldiva State Forest	172
Myrtle State Forest	4298
Nana Creek State Forest	1793
New Valley State Forest	317
Newfoundland State Forest	6025
Nymboida State Forest	6400
Oakwood State Forest	3774
Orara East State Forest	4463
Orara West State Forest	4808
Paddys Land State Forest	907
Pine Brush State Forest	3966
Pine Creek State Forest	866
Ramornie State Forest	6175
Richmond Range State Forest	6406
Royal Camp State Forest	2203
Sheas Nob State Forest	4333
South Toonumbar State Forest	410
Southgate State Forest	628
Spirabo State Forest	4256
Sugarloaf State Forest	6501
Tabbimoble State Forest	2628
Toonumbar State Forest	1381
Torrington State Forest	1672
Tuckers Nob State Forest	738
Unumgar State Forest	3632
Urbenville State Forest	3
Warra State Forest	886
Washpool State Forest	2961
Wedding Bells State Forest	5057
Whiporie State Forest	1110
Wild Cattle Creek State Forest	8771
Willsons Downfall State Forest	317
Woodenbong State Forest	306
Woodford North State Forest	219

Yabbra State Forest	10089
Grand Total	1403565

Appendix B TEC Prioritisation Matrix

Conservation Status

Scores were assigned based on the conservation status of individual communities as listed in the schedules of the *Threatened Species Conservation Act 1995* (TSC Act) and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Known extent

The occurrence of each TEC was considered in relation to the state forest estate boundaries. A range of vegetation mapping resources and the final determination for each community was utilised during this process.

Where polygons of vegetation types consistent with TECs intersected with parcels of state forest, the 'known extent' field was scored as 'known or probable'. Where polygons of vegetation types consistent with TECs occurred within close proximity to state forest boundaries, or, where a range of key diagnostic features influencing occurrence are present in an area, the 'known extent' field was scored as 'possible'. Otherwise, the community is not known to occur in state forest and was scored 0.

The assessment of known extent in state forest is conservative. Where there is uncertainty surrounding extent, the TEC was recorded as possible. In some cases, the TEC in question may occur in state forest but not in the Net Harvest Area (NHA).

Management/ Existing Protection

The degree to which the community is protected by existing measures such as IFOA prescriptions or Forests NSW Forest Management Zones (FMZs) was considered. Exclusion zones were identified and overlaid with known distributions and the final determinations for TECs consulted to determine likelihood of occurrence in the NHA. Scoring was applied based on likelihood of impact from harvest activities on TECs in operational areas.

Potential impact/threat

As per final determination, if forestry activities are listed, known or predicted to be a primary or contributing threat to a TEC, a score was applied in accordance with the table below. Similarly, if forestry activities were implied to cause indirect impacts such as fragmentation, removal of debris or loss of hollows and these impacts are noted in the final determination for the TEC, an alternate score of one was applied.

Field	Description	Score
Conservation Status (TSC Act)	The community is listed in the schedules of the Threatened Species Conservation Act (TSC Act) as Critically Endangered (CE)	2
	The community is listed in the schedules of the Threatened Species Conservation Act (TSC Act) as Endangered (E)	1
	The community is listed in the schedules of the Threatened Species Conservation Act (TSC Act) as Vulnerable (V)	0
Conservation Status (EPBC Act)	The community is listed in the schedules of the Environment Protection And Conservation Act (EPBC Act) as Critically Endangered (CE)	2
	The community is listed in the schedules of the Environment Protection And Conservation Act (EPBC Act) Endangered (E)	1
	The community is not listed in the schedules of the Environment Protection And Conservation Act (EPBC Act)	0

Known Extent	Occurrence of the community in State Forest is known or probable	2
	Occurrence of the community in State Forest is possible	1
	The community is not known to occur in State Forest	0
Management/ Existing Protection	The community occurs in State Forest or Net Harvest Area (NHA) and is likely to be impacted by forestry activities	1
	The community does not occur in State Forest or NHA and/or is unlikely to be impacted by forestry activities	0
Potential Impact/Threat	Logging or firewood collection is listed as a threat in the final determination for the community	2
	Fragmentation, removal of debris, loss of hollows are listed as threats in the final determination for the community	1
	No specific mention of the threats above in the final determination for the community	0

Scoring Fields

Additional considerations (non-scoring)

Harvest Priority

Communities containing species identified by Forestry Corporation NSW as a priority for timber supply purposes, (available, accessible and suitable for timber production) or a commercial value forest type were assigned as ‘high’. Conversely, TECs where marketable timber product is limited or silvicultural type/intensity of operations would limit viability were assigned a ‘low’ classification.

Mappability

A high/low classification was assigned to reflect ease of interpretability via aerial photography analysis. TECs or phototypes that are known to have a distinct signature or be readily distinguishable from adjacent types were assigned a ‘high’ classification and those that were predicted or known to present difficulties in identification, particularly where they occur with/transition to similar types were recorded as ‘low’.

NOTE: *Some lower scoring TECs have been included in this mapping project due to regulatory history and/or close association with a suite of priority TECs and subsequent ease of mapping*

EEC name	TSC status	EPBC status	Gazettal date Gazettal date	Notes	Priority score						Priority for FCNSW Hardwoods Forest Division	Mappability
					Known	Mgmt.	Threat	National	State	Total		
White Box Yellow Box Blakely's Red Gum Woodland	E	CE	15-Mar-02	Widespread, especially in Western Region;	2	1	2	2	1	8	Low. Covered by TSL condition in Western IFOAs. Unlikely in NHA in coastal IFOA areas.	Candidate TEC for a field guide
Lowland Grassy Woodland in the South East Corner Bioregion	E	CE	10-Aug-07	Probably small patches in a number of SFs, eg Towamba, Mumbulla, Dampier	2	1	2	2	1	8	Medium. Probably limited extent in SF but extent uncertain; low timber potential.	Moderate on SF estate
Grey Box—Grey Gum Wet Sclerophyll Forest in the NSW North Coast Bioregion	E		31-Jul-09	Defined on an o/s type but described on u/s for which there is limited quantitative data. Bald Knob, Donaldson, Edinburgh Castle, Mount Lindesay, Unumgar SFs	2	1	2	0	1	6	High. Relatively extensive in SF. High timber potential.	Low-moderate
McKies Stringybark/Blackbutt Open Forest in the Nandewar and New England Tableland Bioregions	E		9-Feb-01	Probable, but only near Inverell, eg Clive SF	2	1	2	0	1	6	Low. Likely to occur to a limited extent in SF, low to moderate timber potential.	Determine granite vs lateritic soils. Moderate to high
White Gum Moist Forest in the NSW North Coast Bioregion	E		4-Jul-08	North from Dorrigo only	2	1	2	0	1	6	Medium. Relatively extensive in SF and high timber potential. Community is relatively well defined by the final determination.	High

Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions	E		22-Dec-06	Mostly covered by rainforest exclusion, but overlaps with brush box forest	2	1	1	1	1	6	Medium. Mostly covered by IFOA rainforest condition, but the final determination is ambiguous and it may occur in areas of high timber potential	High
Lowland Rainforest on Floodplain in the New South Wales North Coast Bioregion	E		13-Aug-99	Mostly covered by rainforest exclusion, but may overlap with brush box forest	2	1	1	1	1	6	Nil as a separate community; medium if mapped with Lowland Rainforest EEC. Very limited extent, if any, in SF.	High
Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions	E	E	17-Dec-10	Mostly covered by IFOA/TSL wetland exclusions	2	1	1	1	1	6	Medium. Nil timber potential but relatively extensive in SF and requires consideration for planned burning and grazing.	Agree on structural limits and map.
New England Peppermint (Eucalyptus nova-anglica) Woodland on Basalts and Sediments in the New England Tableland Bioregion	CE		7-Nov-03	Possible in Walcha MA and Marengo and Chaelundi SFs; very restricted extent if present. consider assemblage not just New England Peppermint	1	1	1	1	2	6	Low. Very limited occurrence, if any, in SF, but currently mapped areas need field checking; low timber potential.	Unknown
Bangalay Sand Forest of the Sydney Basin and South East Corner Bioregions	E		21-Oct-05	Probably small patches in Bermagui, Mogo, Nullica SFs; south from Bundeena only.	2	1	1	0	1	5	Medium. Limited extent in SF but moderate timber potential.	Low. Challenges distinguishing *E botryoides* from *C maculata*
Brogo Wet Vine Forest in the South East Corner Bioregion	E		17-Nov-00	Probable in Mumbulla, Bodalla and possible in Nadgee SF	2	1	1	0	1	5	Medium. Limited extent in SF but moderate timber potential.	Demonstrate absence from SF

Dry Rainforest of the South East Forests in the South East Corner Bioregion	E		17-Nov-00	Most likley covered by rainforest exclusion; probable in Towamba SF, possible in Nullica SF.	2	1	1	0	1	5	Low. Very limited extent in SF. Covered by IFOA rainforest conditions.	Low
Lower Hunter Spotted Gum—Ironbark Forest in the Sydney Basin Bioregion	E		18-Feb-05	Known or probable in Awaba, Corrabare, Heaton, Pokolbin, Watagan SFs; amended 5 Nov 2010	2	1	1	0	1	5	High. High timber potential; extent in SF uncertain.	Undertake QA of work completed and assign confidence to map product.
Milton Ulladulla Subtropical Rainforest in the Sydney Basin Bioregion	E		1-Nov-02	Associated with Milton monzonite; 2 ha mapped in Shallow Crossing SF, but occurrence requires confirmation.	1	1	2	0	1	5	Low. Very limited extent, if any, in SF; Covered by IFOA rainforest conditions. Defined from a single patch of rainforest.	Demonstrate absence from SF
Ribbon Gum—Mountain Gum—Snow Gum Grassy Forest/Woodland of the New England Tableland Bioregion	E		21-Oct-05	Known in Walcha MA only.	2	1	1	0	1	5	Moderate. Extent in SF uncertain due to ambiguous final determination; moderate timber potential.	May be difficult to distinguish *E. viminalis* from *E. nobilis* using remote sensing.
River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E		17-Dec-04	Widespread in all coastal regions south of Taree, but probably mostly covered by riparian and wetland exclusion conditions. Amended 8jul11.	2	1	1	0	1	5	High. Relatively extensive in SF. Moderate to high timber potential.	Many sites may meet environmental but not floristic description of TEC
Subtropical Coastal Floodplain Forest of the New South Wales North Coast Bioregion	E		17-Dec-10	Widespread in coastal areas north from Port Stephens	2	1	1	0	1	5	High. Relatively extensive in SF. Moderate to high timber potential.	High

Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E		17-Dec-04	Widespread in all coastal regions, but probably mostly covered by riparian and wetland exclusion conditions under IFOA.	2	1	1	0	1	5	Low as a separate community, high if mapped as part of a floodplain EEC composite. Mostly not in NHA and usually low timber potential.	High
Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland in the South Eastern Highlands, Sydney Basin, South East Corner and NSW South Western Slopes Bioregions	E	?	15-Apr-11		2	1	1	0	1	5	Moderate. Extent in SF uncertain due to ambiguous final determination; negligible to possibly moderate timber potential, depending on interpretation.	Moderate to high; depending on suitable environmental and structural surrogates for u/s composition.
Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E	CE	4-Jun-04	Covered by general exclusion	1	0	1	2	1	5	Low. Unlikely in SF; may overlap with brush box forest in UNE but covered by rainforest exclusion elsewhere.	High
Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E		17-Dec-04	Requires specific condition. Most occurrences excluded by wetland or rare and non-commercial forest type exclusions under IFOA.	2	1	1	0	1	5	Low as a separate community, high if mapped as part of a floodplain EEC composite. Mostly not in NHA and usually low timber potential.	High
Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions	E		4-Jan-08	Mapped for Wingello and Belanglo SFs only, not known in FMZ 4. Mt Rae, PNF hotspot	2	0	1		1	4	Low. Very limited extent in SF, not in NHA.	Low
Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E		4-Jun-04	Covered by general exclusion. Ease of capture with other floodplain assemblages	1	0	0	0	1	2	Treeless community adequately covered by IFOA/TSL wetland exclusions. Low	High

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