Coastal Swamp Oak (*Casuarina glauca*) Forest of South-east Queensland and New South Wales:

Proposal to list as a nationally protected ecological community

Coastal Swamp Oak Forest ecological community, Coffs Harbour, NSW.

This information guide explains why the Coastal Swamp Oak Forest ecological community is being assessed as potentially threatened under the national *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), what a listing would achieve and mean for the people in coastal areas where it occurs.

The Coastal Swamp Oak Forest ecological community has been nominated for protection as a nationally listed ecological community under the *Environment Protection and Biodiversity Conservation* Act 1999 (EPBC Act).

It was nominated in 2014 and a scientific assessment is underway to determine its eligibility for listing. This assessment culminates in a document called a Conservation Advice which will:

- clarify what kind of forests are covered by the proposed listing;
- identify the evidence that shows these forests to be threatened; and
- recommend what can be done to minimise further damage to these forests and help recover degraded patches.

The draft scientific assessment, included within a draft Conservation Advice, is now available for comment. Your feedback on the proposal to list the ecological community as threatened is welcome. See back page of this guide for details of how to provide your comments.

Images

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What is the Coastal Swamp Oak Forest ecological community?

The ecological community was nominated as “Swamp Oak Coastal Floodplain Forest”, but is now described as the “Coastal Swamp Oak Forest of South-east Queensland and New South Wales”.

The Coastal Swamp Oak Forest ecological community is characterised by the dominance of *Casuarina glauca* in the canopy, with an understorey of rushes, sedges, forbs and grasses. Coastal Swamp Oak Forest is typically found on loose or alluvial soil on coastal flats, floodplains, drainage lines, lake margins, wetlands and estuarine fringes where soils are at least occasionally saturated, water-logged or inundated. Sometimes the ecological community can intergrade with mangroves or saltmarsh communities (on the seaward side), or with *Melaleuca* species and eucalypts (more landward).

Remnant patches of Coastal Swamp Oak Forest that retain mature trees and/or with diverse and good native understorey, particularly those that are closely connected with another area of native vegetation have very high conservation value. Like other coastal ecosystems, the ecological community provides an important protective role, by buffering the land from the impacts of seawater incursions and storms.

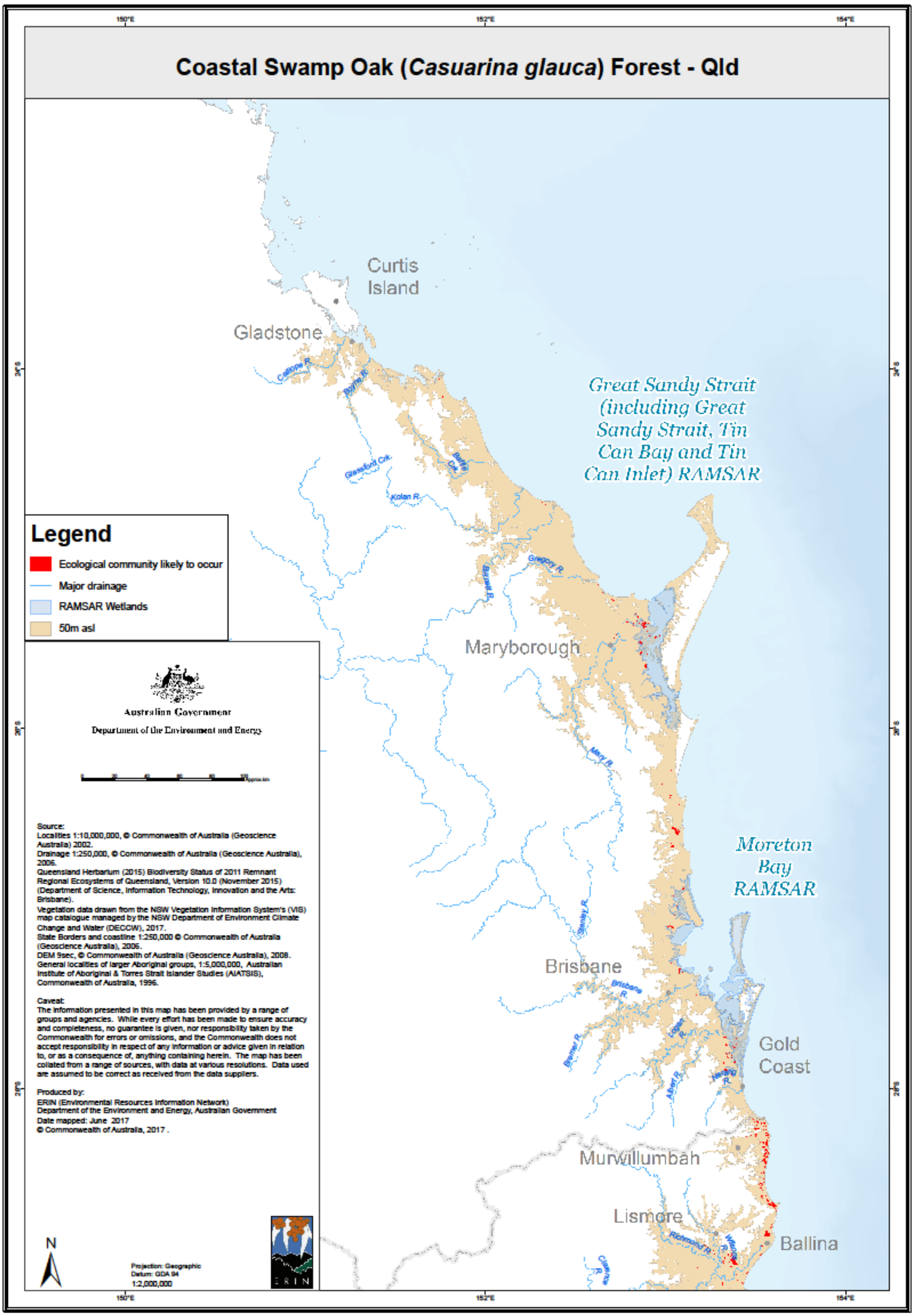
While swamp oak is the main tree seen in the canopy, other species like lilly pillies (*Acmena smithii*), red ash or soap tree (*Alphitonia excelsa*), weeping bottlebrush (*Callistemon saligna*), tuckeroo (*Cupaniopsis anacardioides*) and cheese trees (*Glochidion ferdinandi*) can form a sub-canopy. Paperbarks (*Melaleuca* spp.) can sometimes co-dominate the canopy, but this depends on the relative salinity of the area. Climbers and twiners, such as common silkpod (*Parsonsia straminea*) and some epiphytic ferns may contribute to the mid-layer. Sometimes *Eucalyptus* spp. can emerge above the canopy.

The ground layer of the ecological community will be influenced by the salinity of the underlying groundwater. In saline or brackish areas, salt tolerant rushes (e.g., *Baumea juncea*); sand couch (*Cynodon dactylon*); reeds (*Phragmites australis*) and austral seablite (*Suaeda australis*) are likely to be present. More freshwater species include: ferns (e.g., *Blechnum indicum*), sedges (*Carex appressa*), rushes *(Gahnia clarkei*; *Lomandra longifolia*), pennywort (*Centella asiatica*), spiny- weeping grass (*Microlaena stipoides*) and wild violets (*Viola banksii*).

A brown ringlet butterfly rests on a groundcover made of creeping beard grass in Coastal Swamp Oak Forest on the NSW South Coast

Where is Coastal Swamp Oak Forest located?

The ecological community mostly occurs as scattered remnant patches along the coast between Curtis Island (south-east Queensland) and Bermagui (southern New South Wales), up to 50 m above sea level (ASL) but typically less than 20 m ASL. Most occurrences are within 30km of the coast, but in some areas, such as along tidal river catchments, the ecological community can occur more than 100km inland. Maps on **pages 4-6** indicate the estimated distribution of the ecological community.


Coastal Swamp Oak (Casuarina glauca) Forest - Qld
150°E
152°E
154°E
24°S
26°S
28°S
Curtis Island
Gladstone
Calliope R.
Boyne R.
Great Sandy Strait (including Great Sandy Strait, Tin Can Bay and Tin Can Inlet) RAMSAR
Graveford Ck.
Kolan R.
Burnett R.
Gregory R.
Maryborough
Mary R.
Moreton Bay RAMSAR
Sandy R.
Brisbane
Brisbane R.
Logan R.
Albert R.
Nerang R.
Gold Coast
Murwillumbah
Lismore
Richmond R.
Tweed R.
Ballina
Legend
Ecological community likely to occur
Major drainage
RAMSAR Wetlands
50m asl
Australian Government
Department of the Environment and Energy
Source:
Localities 1:10,000,000, © Commonwealth of Australia (Geoscience Australia) 2002.
Drainage 1:250,000, © Commonwealth of Australia (Geoscience Australia), 2006.
Queensland Herbarium (2015) Biodiversity Status of 2011 Remnant Regional Ecosystems of Queensland, Version 10.0 (November 2015) (Department of Science, Information Technology, Innovation and the Arts: Brisbane).
Vegetation data drawn from the NSW Vegetation Information System's (VIS) map catalogue managed by the NSW Department of Environment Climate Change and Water (DECCW), 2017.
State Borders and coastline 1:250,000 © Commonwealth of Australia (Geoscience Australia), 2006.
DEM 9sec, © Commonwealth of Australia (Geoscience Australia), 2008.
General localities of larger Aboriginal groups, 1:5,000,000, Australian Institute of Aboriginal & Torres Strait Islander Studies (AIATSIS), Commonwealth of Australia, 1996.
Caveat:
The information presented in this map has been provided by a range of groups and agencies. While every effort has been made to ensure accuracy and completeness, no guarantee is given, nor responsibility taken by the Commonwealth for errors or omissions, and the Commonwealth does not accept responsibility in respect of any information or advice given in relation to, or as a consequence of, anything containing herein. The map has been collated from a range of sources, with data at various resolutions. Data used are assumed to be correct as received from the data suppliers.
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ERIN (Environmental Resources Information Network)
Department of the Environment and Energy, Australian Government
Date mapped: June 2017
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Projection: Geographic
Datum: GDA 94
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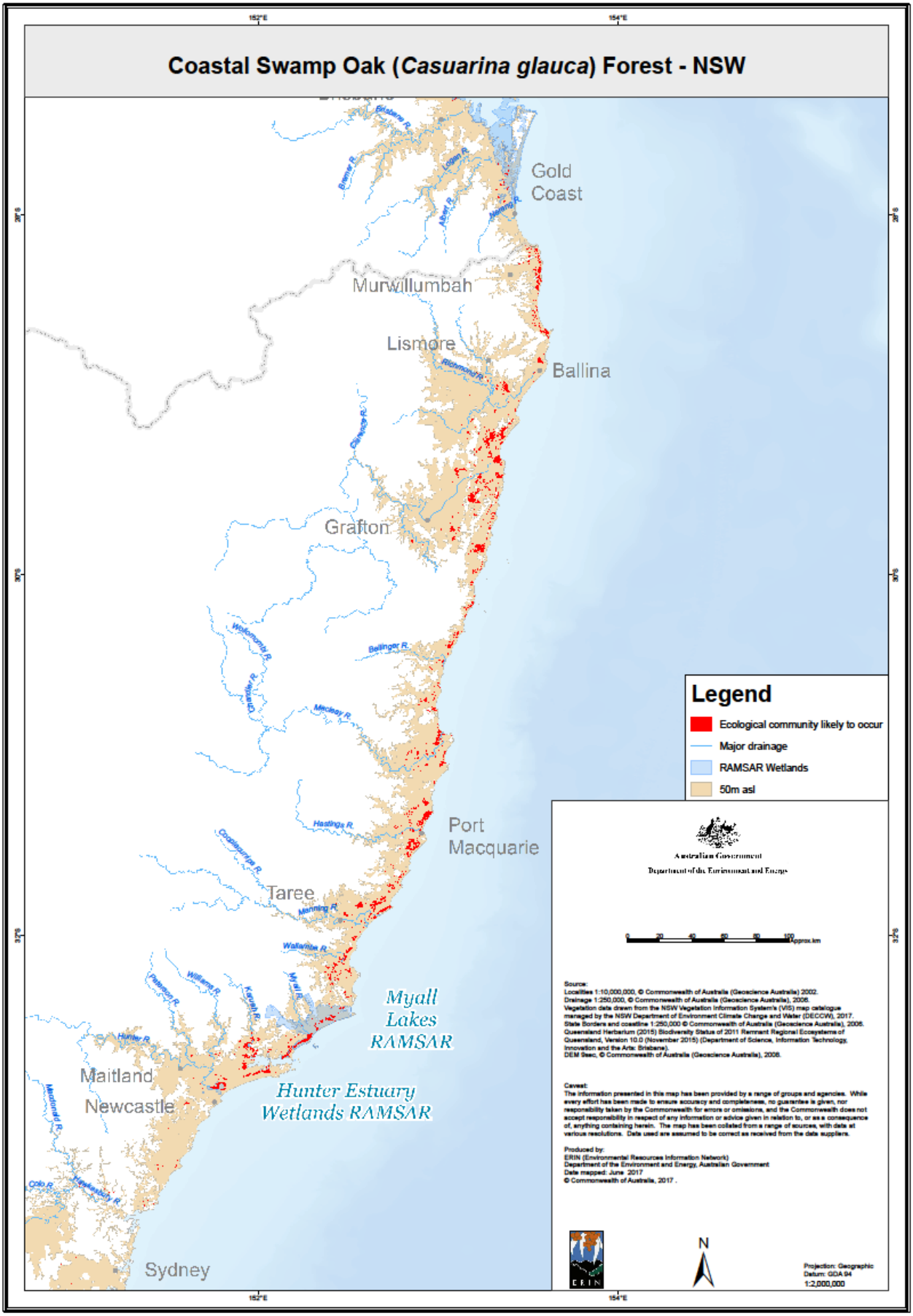
ERIN


Coastal Swamp Oak (Casuarina glauca) Forest - NSW
152°E
154°E
30°S
31°S
Gold Coast
Murwillumbah
Lismore
Ballina
Grafton
Port Macquarie
Taree
Myall Lakes RAMSAR
Hunter Estuary Wetlands RAMSAR
Maitland
Newcastle
Sydney
Brisbane R.
Logan R.
Albert R.
Nerang R.
Richmond R.
Clarence R.
Wilsons R.
Bellinger R.
Macleay R.
Hastings R.
Manning R.
Wallamba R.
Wallis L.
Hunter R.
Paterson R.
Williams R.
Karuah R.
Macdonald R.
Colo R.
Hawkesbury R.
Legend
Ecological community likely to occur
Major drainage
RAMSAR Wetlands
50m asl
Australian Government
Department of the Environment and Energy
Source:
Localities 1:10,000,000, © Commonwealth of Australia (Geoscience Australia) 2002.
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N
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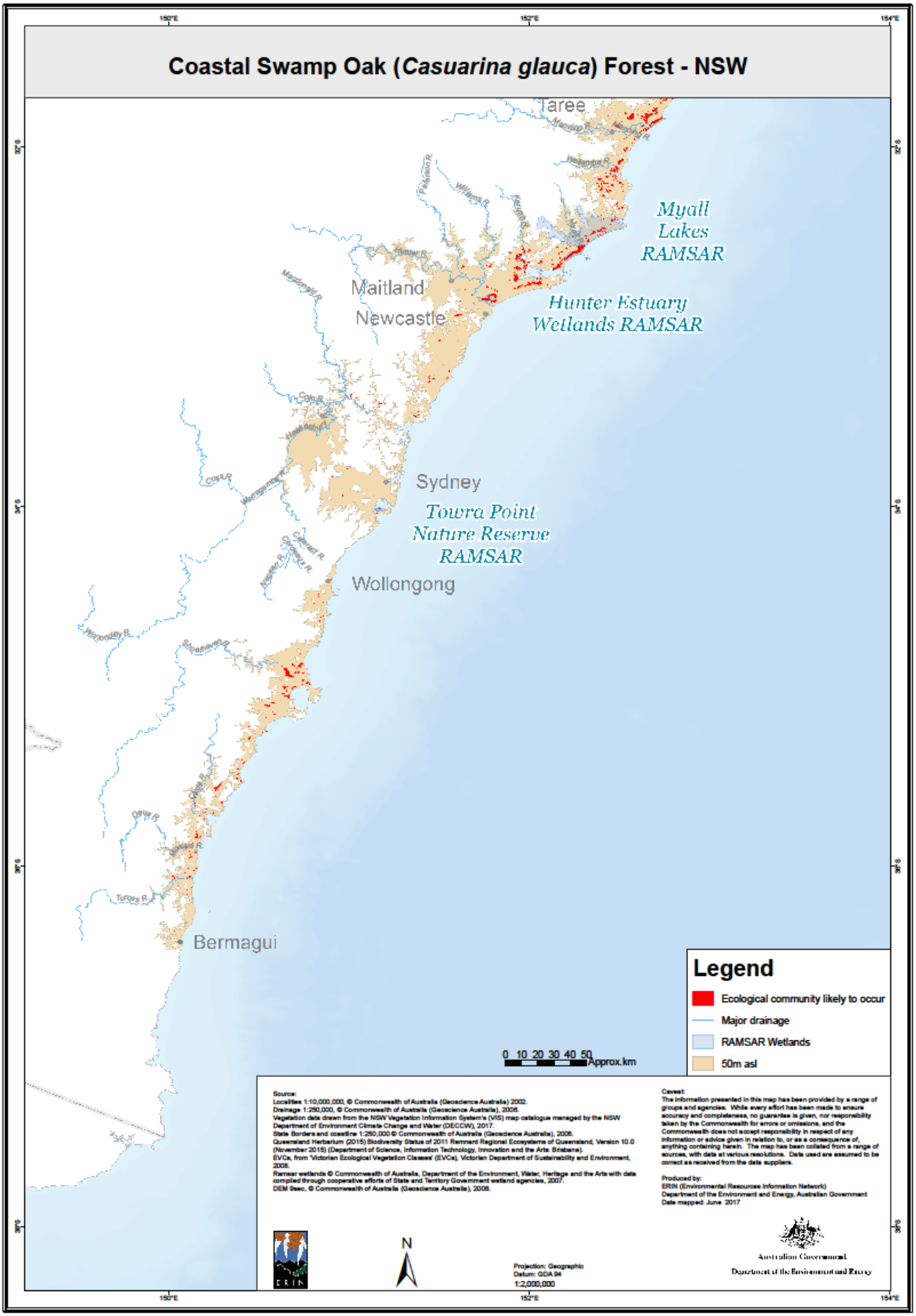

Coastal Swamp Oak (Casuarina glauca) Forest - NSW
150°E
152°E
154°E
32°S
34°S
36°S
Taree
Myall Lakes RAMSAR
Maitland
Newcastle
Hunter Estuary Wetlands RAMSAR
Sydney
Towra Point Nature Reserve RAMSAR
Wollongong
Bermagui
Legend
Ecological community likely to occur
Major drainage
RAMSAR Wetlands
50m asl
0 10 20 30 40 50
Approx.km
N
Projection: Geographic
Datum: GDA 94
1:2,000,000
Australian Government
Department of the Environment and Energy

Why is Coastal Swamp Oak Forest threatened, and why is it important to protect it?

The draft conservation advice recommends the Coastal Swamp Oak Forest may be eligible for listing nationally as **Endangered**.

The draft assessment found that the decline of the ecological community is **severe**, with only about 26% of its original extent remaining. Loss is mainly due to historical clearance for agriculture and pastoral activities and associated impacts, as well as increased coastal development and the impacts of urban and peri-urban activities.

The remaining forest areas face ongoing threats from continued clearing, invasion by weeds and feral animals, the impacts of fire and potential impacts from sea level rise.

There are many reasons to keep what's left of Coastal Swamp Oak Forest and to recover or expand remnants. As a coastal ecological community it provides important benefits to the environment of the eastern seaboard, where many people live.

At least 14 Traditional Owner groups are connected with the extent of the ecological community. Many plants and animals found in the ecological community have practical and cultural significance – ranging from building materials to important medicine and food resources.

The ecological community also supports soil formation, nutrient exchange and regulates water flow through the landscape. Along with adjacent vegetation, such as salt marsh and mangroves, Coastal Swamp Oak Forest reduces the impacts of soil erosion, nutrient export and other undesirable impacts of human activities. The ecological community mitigates the impacts of flooding events and tidal surges.

A wide range of plants and animals depend upon the ecological community for food and shelter. Most animals that inhabit the ecological community also inhabit adjacent wetlands, grasslands, woodlands and forests. These include bats, possums, bandicoots, birds, frogs, turtles and other reptiles. The insect prey of these species include butterflies and native stingless bees which also pollinate the flowering plants found within the ecological community.

Many species that occur in the ecological community are listed as threatened under State and/or Commonwealth legislation, such as the swift parrot, an important pollinator and seed disperser.

Supportive practices have helped to retain many remnants of Coastal Swamp Oak Forest. Because this ecological community occurs near watercourses and provide shelter for stock, some remnants have been intentionally set aside by landowners. These patches are important for conservation because they provide habitat for native species, and corridors for the movement of native wildlife and prevent bank erosion.

Listing is intended to further support land managers who want to retain or recover good quality patches of Coastal Swamp Oak Forest.

What state-identified forests and woodlands may be protected as the Coastal Swamp Oak Forest?

Several state vegetation mapping units have been identified to contain the Coastal Swamp Oak Forest. These may be familiar to some land managers, so are listed below:

In Queensland, the two main units that contain Coastal Swamp Oak Forest are:

- RE12.1.1 *Casuarina glauca* woodland on margins of marine clay plains; and
- RE 12.3.20 *Melaleuca quinquenervia, Casuarina glauca* +/- *Eucalyptus tereticornis, E. siderophloia* open forest on low coastal alluvial plains.

In New South Wales, the ecological community corresponds with those parts of the NSW-listed threatened ecological community - 'Swamp oak floodplain forest of the NSW North Coast, Sydney Basin and South East Corner bioregions' where the canopy is dominated by *Casuarina glauca*.

More specifically, Coastal Swamp Oak Forest patches are likely to correspond with the Plant Community Types (PCT) listed in the following table:

SW PCT ID	Common name	NRM Regions
1235	Swamp oak swamp forest of the coastal lowlands NSW North Coast Bioregion	Northern Rivers
1917	Swamp Oak forested wetland of saline areas of coastal - estuaries	North Coast
1921	Milky mangrove woodland of tidal estuaries	North Coast
1920	Swamp oak – broad-leaved paperbark – willow bottlebrush floodplain forested wetland -	North Coast
1924	Broad-leaved paperbark – swamp oak – tall sedge swamp forest on alluvial soils -	North Coast
1800	Swamp oak open forest on riverflats of the Cumberland Plain and Hunter Valley	Sydney Metro/ Hawkesbury-Nepean
1727	Swamp-oak-sea rush (*Baumea juncea*) swamp forest	Hunter/Central Rivers
1728	Swamp oak- prickly paperbark tall sedge forest Central Coast and Lower North Coast	Hunter/Central Rivers
1232	Coastal freshwater swamp forest	Sydney Metro
1234	Swamp oak swamp forest fringing estuaries of the Sydney Basin and South East Corner Bioregion	Hunter/Central Rivers; Hawksbury Nepean; Sydney Metro; Southern Rivers
1236	Swamp paperbark-swamp oak	Sydney Metro and Southern Rivers
781	Coastal freshwater lagoons of the Sydney Basin Bioregion and South East Corner Bioregion	Sydney Metro and Southern Rivers

How can I tell if a patch of the Coastal Swamp Oak Forest is present and in reasonably intact condition?

The following summary indicates the key descriptive characteristics of the ecological community:

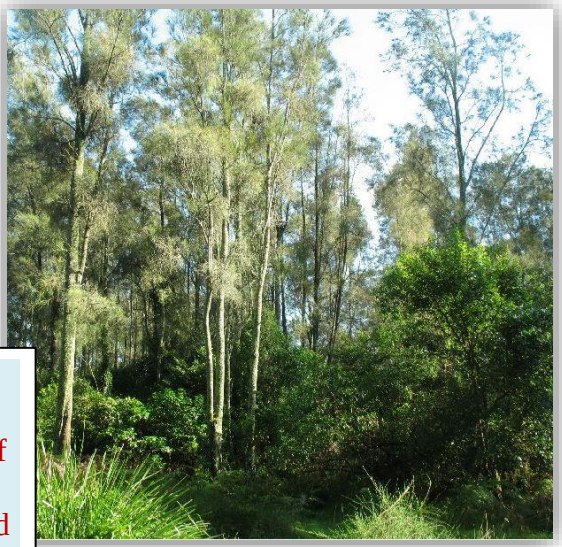
- Occurs within the South Eastern Queensland, NSW North Coast, Sydney Basin, or South East Corner bioregions.
- Occurs in coastal catchments at elevations up to 50 m ASL, typically less than 20 m ASL.
- Occurs on soils derived from unconsolidated sediments (including alluvium), typically hydrosols (grey-black clay-loam and/or sandy loam soils) and sometimes organosols (peaty soils).
- Occurs on coastal flats, floodplains, drainage lines, lake margins, wetlands and estuarine fringes where soils are at least occasionally saturated, water-logged or inundated. Minor occurrences on coastal dune swales or flats, particularly deflated dunes and dune soaks.
- Has a forest or woodland structure, with a total canopy cover of at least 10%.
- Has a canopy dominated by *Casuarina glauca* (swamp-oak, swamp-she oak).

Other characteristics that may help identify the ecological community include:

- Typically occurs where groundwater is saline or brackish.
- In more freshwater variants of the ecological community, *Casuarina glauca* may co-dominate with *Melaleuca* species.
- Occurs typically within 30km of the coast, but in some areas along tidal river catchments the ecological community can occur more than 100km inland.
- Does not occur on headlands, sea cliffs or other consolidated sediments but may occur in transitional soils where unconsolidated sediments border solid substrates.

National protection is proposed to only apply to patches of the Coastal Swamp Oak Forest that retain a reasonably intact understorey or other conservation values.

These are patches that are of reasonable size where non-native species make a small proportion of total understorey vegetation cover and where exotic transformer weeds (i.e. those that can change the nature of the forest) are largely lacking. Such areas are often connected to other kinds of native forests and vegetation, as a part of a larger native vegetation remnant.



Right: Tree canopy is dominated by swamp oak. This occurs when swamp oak is the most abundant tree in terms of cover or stem density.
The better quality native understorey and the fewer exotic weeds species, the more valuable the patch.

Left: a high quality ground layer comprising native forbs and plant litter. NSW North Coast, 2016.

A reasonably intact understorey.
Most of the understorey vegetation cover is of native species. The understorey typically has forbs, sedges, grasses and plant litter, but can this can vary depending on the level of inundation and/or exposure to brackish water.

How big should a patch of the Coastal Swamp Oak be?

Patches of Coastal Swamp Oak Forest that are in **excellent condition** (this includes having a **low level of weeds**) and are isolated from other native vegetation **must be at least 2 hectares (ha) in size** to qualify for protection under national environmental law. Patches in **excellent condition** that are **contiguous with another area of native vegetation** that is **at least 2 ha**, **must be at least 0.5 ha**.

Patches of the ecological community that are in **good condition** (and a **moderate level of weeds**) and are isolated from other native vegetation **must be at least 1 ha**. Good quality patches in **good condition** that are **contiguous with another area of native vegetation** that is **at least 2 ha**, **must be at least 0.5 ha**.

Large patches in **moderate condition** (with a **moderate to high level of weeds**) that are isolated from other native vegetation **must be at least 5 ha** before they qualify for national protection. **Moderate condition** patches that **are contiguous with another area of native vegetation** of **at least 5 ha** - **must be at least 1 ha**.

Patches of Coastal Swamp Oak forest that are too small or degraded are not protected as the ecological community. This includes paddock trees, small or narrow patches generally under 0.5 ha in size, and patches of trees where the understorey has been entirely replaced by crop, pasture and/or weed species. This would apply to many patches on farms that serve as shelterbelts and windbreaks, very narrow road verges and areas in coastal recreation parklands.

Potato Point NSW, Photo: © Jackie Miles, 2017

How will national protection affect developers and land managers - what happens if I have Coastal Swamp Oak Forest on my land?

National protection only applies to **new** actions likely to cause **significant** damage to patches of these forests that remain in good condition. How you may be affected if the ecological community is nationally listed depends on:

- whether you have a large patch of good quality Coastal Swamp Oak Forest on your land; and,
- what you intend to do with any such patches.

I want to keep or improve my patches of Coastal Swamp Oak Forest

Land managers who want to retain good quality forest, or intend to restore any forests on their properties may be eligible for funding to help with their conservation.

Relevant national environmental funding opportunities may include the National Landcare Programme, 20 Million Trees or the Threatened Species Recovery Fund or the Indigenous involvement in these programs. Many projects specifically target nationally listed threatened ecological communities.

Opportunities such as these are designed to help people undertake conservation works across Australia. Regional Catchment, Local Land Services or National Resource Management (NRM) groups also offer funding and advice support to help landholders look after their landscape and remnant vegetation.

I'm just doing usual routine activities to maintain my land

There are exemptions in national environment law that would apply here. Routine and ongoing activities by farmers, local government bodies and business are not impacted by national listings. This has been the case for other ecological communities that have been listed in other coastal areas of Australia, including the Littoral Rainforest and Coastal Vine Thickets of Eastern Australia, listed in 2008.

There are exemptions for long-term, continuing or routine activities, such as normal farm practices, property maintenance, weed or pest control, or usual roadside and park maintenance activities.

I have a new development that involves clearing Coastal Swamp Oak Forest.

Referrals usually apply to **major** projects, for instance new mines or mine expansions, major new road works, new housing and industrial developments.

- **Check** you have the right type of forest present and if it's in good enough condition to be referred [see previous pages for some guidance or seek help from local NRM groups. For more information see: www.nrm.gov.au]

- **Plan** to avoid or minimise impacts to Coastal Swamp Oak Forest patches, especially the best quality patches.

- **Talk with the Australian Government Department of the Environment and Energy** to see if the action may significantly impact Coastal Swamp Oak Forest and needs to be referred for national approval.

Note that your current socio-economic circumstances plus any past environmental history can be taken into account when approving any action that has to be referred under the EPBC Act.

There also may be other nationally-protected matters that need to be considered, for instance any nationally threatened and migratory species likely to use the patch as habitat, including species that depend on aquatic environments. Birds, swift parrot in particular, and other mobile species, are known to use Coastal Swamp Oak Forest as feeding and nesting habitat. Some other mammals, or other listed species, including plants, may also occur at some sites.

What other protection applies to Coastal Swamp Oak Forest?

The New South Wales and Queensland governments also have laws on vegetation clearance and protecting State-listed vegetation communities that may apply to certain activities.

Where do I get documents about the Coastal Swamp Oak Forest, and how do I comment on the proposal?

The draft Conservation Advice and other information about how to make a submission, including questions to guide your responses, are on the website of the Department of the Environment and Energy: http://www.environment.gov.au/biodiversity/threatened/nominations/comment

Where do I find information about national environmental law and Australian Government funding programs?

Advice about Australian Government environmental funding programmes can be found at: http://www.environment.gov.au/about-us/grants-funding

Those under the National Landcare Programme can be found at: http://www.nrm.gov.au/national-landcare-programme

Information about funding targeted at threatened species that may inhabit the ecological community can be found at: http://www.nrm.gov.au/national/threatened-species-recovery-fund

The Indigenous Protected Areas program is administered by the Department of the Prime Minister and Cabinet on behalf of the Department of the Environment and Energy. Participation of Indigenous communities in the protection/conservation of ecological communities on their country is also encouraged. For more information please see: http://www.nrm.gov.au/indigenous-nrm

Information about the EPBC Act referral and assessment process is available at: http://www.environment.gov.au/protection/environment-assessments/assessment-and-approval-process

If you have any questions, then please contact:

Department of the Environment and Energy
Tel: 1800 803 772 or email ciu@environment.gov.au.

OR

Contacts given with the documents open for consultation at:
http://www.environment.gov.au/biodiversity/threatened/nominations/comment