Indicator 1.3b: Native forest and plantations of indigenous timber species which have genetic resource conservation mechanisms in place (2024)

This indicator uses the coverage and implementation of formal genetic resource conservation mechanisms as a measure of the degree to which timber species genetic resources are managed and conserved.

Context and definitions

This indicator considers both the conservation of native (indigenous) forest plant genetic resources, and the conservation and genetic improvement of native wood production species used in Australia's plantations.

Genetic resources: genetic material that has actual or potential value, and encompasses the genetic diversity both within and between species.

Ex situ conservation: the conservation of species and genetic components of biological diversity outside their natural habitats.

In situ conservation: the conservation of species and genetic components of biological diversity in their natural habitats.

Key points

- There are 129 tree species and hybrids listed by the Food and Agriculture Organization (FAO) of the United Nations as forest genetic resources for Australia.
- All 115 Australian native species and hybrids listed by the FAO as forest genetic resources for Australia have populations conserved in situ in formal and informal reserves and protected areas across Australia.
- Australia's seed banks hold seed for 127 of the 129 native and non-native species and hybrids listed by the FAO as forest genetic resources for Australia.

In situ conservation

In situ conservation of forest biodiversity, whether in protected areas such as nature conservation reserves and national parks, in multiple-use public native forests or on privately managed land, is the primary mechanism for conservation of forest genetic resources in Australia. The genetic diversity of species populations conserved in native forests also underpins plant breeding strategies and ex situ conservation actions.

There are 131.5 million hectares of native forests in Australia (see Indicator 1.1a). Of this, 48.9 million hectares are managed for protection of biodiversity by various mechanisms (see Indicator 1.1c). Australia's native forests contain 13,788 native forest-dwelling vascular plants, including tree, shrub and groundcover species (see Indicator 1.2a), 983 of which are listed as threatened under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (see Indicator 1.2b).

There are 129 tree species and hybrids listed by the Food and Agriculture Organization of the United Nations (FAO) as forest genetic resources for Australia, of which 115 are native (Lott and Read 2021). All these 115 native species and hybrids have populations conserved in situ in formal and informal reserves and protected areas, and

some of these species are also formally protected under legislation. A total of 17 native species on the FAO list of forest genetic resources for Australia are listed as threatened under the EPBC Act, with conservation advice or recovery plans in place to support their conservation and recovery.

Unregulated disturbance can threaten the genetic diversity of forest-dwelling species managed in situ. State governments have guidelines and management plans for conserving the genetic diversity of species of commercial significance during wood harvesting in native forests, including the requirements for maintaining local gene pools and the approximate composition and spatial distribution of all species. As examples:

- In Tasmania, codes of forest practice specify that harvested native forest is regenerated or re-sown with a species mix that approximates the natural mix of canopy trees present before harvest, and seed is to be sourced either from the stand to be harvested or from the nearest similar ecological zone ('seed zone'). Management plans may include specifications for selection of seed from elite or plus trees of good form and health (FPA 2020).
- In Western Australia, silvicultural guidelines specify the seed sources to be used in the rehabilitation of log landings within all harvested coupes and in areas cleared for bauxite mining in jarrah (*Eucalyptus marginata*) forest (Conservation Commission of Western Australia 2013).

Ex situ conservation

Ex situ conservation complements in situ conservation through botanic gardens, seed banks, provenance or clonal plantings, seed orchards, seed production areas and other types of conservation plantings. Ex situ conservation is applied to species under genetic improvement for wood production, and to species for which genetic diversity is threatened in native forests.

- Australia's seed banks hold seed for 127 of the 129 native and non-native species and hybrids listed by FAO as forest genetic resources for Australia.
- Millennium Seed Bank Partnership has the goal of banking the world's flora in the Millennium Seed Bank, England. As of 1 January 2021, the Australian Seed Bank Partnership has contributed 12,300 collections of seed to the Millennium Seed Bank, including forest species.
- A national collection of seeds of more than 770 tree and shrub species including more than 230 *Acacia,* 17 *Allocasuarina,* 10 *Casuarina,* 24 *Corymbia,* 295 *Eucalyptus* and 36 *Melaleuca* species is maintained by the Australian Tree Seed Centre.
- Seed Production Areas are areas planted with native plants in order to harvest seed, generally for environmental or biodiversity plantings (Baker 2021). Greening Australia's largest Seed Production Area has provided seed for 150 understorey species used for restoration of grassy woodlands, largely on cleared agricultural land.
- Nindethana Australian Seeds has collected for sale seeds of a wide range of native species, including forest tree and understorey species.

Plant Germplasm Conservation Guidelines (Martyn Yenson et al. 2021) and Translocation Guidelines (Commander et al. 2018) present best practice in seed collection, handling and storage, tissue culture, cryopreservation and restoration plantings. Following best practice ensures that good quality seed from known and appropriate locations and parentage is used in conservation plantings, including choosing material that anticipates climate change.

Conservation collection should aim to include as many sites (provenances) as possible across the geographic distribution of a species to maximise capturing genetic variation and genes important for adaptation to a changing climate. Equally important is a good understanding of species ecology (such as fertilisation process and plant-pollinator interaction, pest and disease, and germination and seedling establishment requirements) to

enhance species distribution modelling and identify refugia under future climate scenarios. Acquiring this knowledge is important to support management decisions for various in situ conservation activities, as well as strategies to source and maintain collections for ex situ conservation, to ultimately enhance the effectiveness of overall genetic conservation in the face of climate change. Indicator 1.3a provides further information on threats to genetic diversity.

Tree improvement and breeding

Australia's forest genetic resources play an important role in maintaining and improving plantation forest productivity by conserving the original genetic variation in species, and through providing source material from which desirable traits can be observed and selected. Selection of desirable traits include tree genotypes of higher growth rate and improved wood quality, that are better adapted to projected warmer and drier climate conditions, or that are resistant or tolerant to existing as well as novel pests and diseases (Byrne et al. 2013).

A substantial proportion of the genetic base of Australian native forest trees used in commercial plantations is conserved in forest reserves. In addition, much of the genetic base has also been brought into seed collections, tree improvement and breeding programs, and seed orchards (plantations specifically planted and managed for seed production).

In commercial forestry, seed orchards and clonal stock hedges are planted and managed to produce quantities of improved seed and cuttings for tree breeding and plantation establishment (Radke 2006). A large number of seed orchards have been established across Australia (see Table 1.3b-4 in Supporting information for Indicator 1.3b).

Seed collections for research and commercial purposes (wild-collected seed or improved through tree breeding) are available for seven plantation genera grown for timber (or essential oils) in Australia: *Acacia*, *Araucaria*, *Casuarina*, *Corymbia*, *Eucalyptus*, *Grevillea* and *Santalum* (Table 1.3b-1 in Supporting information for Indicator 1.3b).

Active tree-breeding and/or improvement programs exist for more than 30 native wood-producing and oil-producing species including 4 *Corymbia* species, 18 *Eucalyptus* species, 1 *Grevillea* species and 3 *Santalum* species. Information on varieties, provenance (locality), or parentage of the seed and the organisations that manage the programs are presented in Table 1.3b-2 in Supporting information for Indicator 1.3b.

Tree improvement trials for main species under active management in Australia include silvertop or shining gum (*Eucalyptus nitens*), blackbutt (*E. pilularis*) and three sandalwood species (Table 1.3b-3 in Supporting information for Indicator 1.3b). Seed orchards are established for various plantation species including for blue gum (*E. globulus*) (Table 1.3b-4 in Supporting information for Indicator 1.3b).

Since the previous update of this indicator in Australia's State of the Forest Report 2018, tree breeding programs for Australia's main wood plantation species (*E. globulus*, *E. nitens*, *Corymbia* species, other selected eucalypts and *Santalum spicatum)* have continued. These tree improvement programs are maintained by various forestry and government agencies (Table 1.3b-2 in Supporting information for Indicator 1.3b). Some new eucalypt seed orchards have been established, while several orchards have been lost due to fire or land use changes (e.g. for *E. botryoides, E. sieberi* and *E. tricarpa*). More details are given in Lott and Read (2021).

Southern (Tasmanian) blue gum and shining gum

Tree Breeding Australia (formerly the Southern Tree Breeding Association) runs a cooperative national tree improvement program for southern (Tasmanian) blue gum (*E. globulus*) and provides a database and quantitative analytical services for shining gum (*E. nitens*) and other plantation species. Some important parts of the genetic

material for *E. globulus* and *E. nitens* are now held only in existing Australian plantations and special-purpose field trials.

Sustainable Timber Tasmania and its predecessors have maintained a *E. nitens* breeding program for 40 years (Hamilton et al. 2008), producing seed and seedlings for sawlog plantations. Sustainable Timber Tasmania is also a member of Tree Breeding Australia's breeding program for *E. globulus*. Forico also manages a breeding program for *E. nitens* in Tasmania.

Grafted trees of *E. globulus* have been planted in the National Genetic Resource Centre for plantation forestry at Mount Gambier, South Australia, which was launched in August 2005 with support from the Australian and South Australian governments. Control-pollinated *E. globulus* seed is collected and stored in seed banks or seed storage facilities, and diversity is maintained in numerous field trials spread across temperate Australia. The TREEPLAN® genetic evaluation system is being used to update genetic values for *E. globulus* and *E. nitens*.

Gympie messmate and spotted gums

The Queensland Department of Agriculture and Fisheries manages a range of seed orchards for producing improved seeds of *Eucalyptus* and *Corymbia*. Current tree breeding and improvement research is focused on Gympie messmate (*E. cloeziana*) and spotted gums (*C. citriodora* ssp. *citriodora*, *C. citriodora* ssp. *variegata*, *C. henryi* and *C. torelliana*) and on determining species susceptibility to myrtle rust (*Puccinia psidii*).

Blackbutt

The Forestry Corporation of New South Wales manages two seed orchards of blackbutt (*E. pilularis*) that have been retained from a previous tree improvement and breeding program. Seed is collected from the historic blackbutt seed orchards, and a register of plus trees (naturally occurring trees with desirable traits such as form and vigour) is maintained.

Other eucalypts

The Australian Tree Seed Centre conducts a number of provenance progeny tests (many in partnership with state governments and private growers) that serve as repositories of genetic material for species including the spotted gums (*C. citriodora* ssp. *variegata*, *C. henryi* and *C. maculata*), river red gum (*E. camaldulensis*), sugar gum (*E. cladocalyx*), Dunn's white gum (*E. dunnii*), swamp yate (*E. occidentalis*), large-fruited red mahogany (*E. pellita*), Sydney blue gum (*E. saligna*) and red ironbark (*E. sideroxylon* and *E. tricarpa*) (Singh et al. 2013).

Sandalwood

Sandalwood plantations in Australia comprise Indian sandalwood (*Santalum album*, using introduced provenances from India, Timor and Indonesia rather than native provenances) and, more recently, Australian sandalwood (*S. spicatum*). In Western Australia, the Forest Products Commission and private industry have an active breeding program to improve selections of *S. album* and *S. spicatum* for productivity and oil yield. Seed of *S. spicatum* is harvested from native stands and increasingly from cultivated stands in the Western Australian wheatbelt (see also Table 1.3b-1 in Supporting information for Indicator 1.3b).

In Queensland, the University of the Sunshine Coast has established an initial trial of the Queensland native species northern or Cape York sandalwood (*S. lanceolatum*).

Hoop pine

HQPlantations in Queensland manage three clonal seed orchards of hoop pine (*Araucaria cunninghamii*) that have been retained from a previous tree improvement and breeding program, and is actively developing two more based on the grafting of previously selected clones. Several clone bank facilities are maintained, while others are disappearing as the surrounding plantation compartment is harvested. A register of plus (superior) trees is kept.

Genetic research for species management

Information on the genetic diversity and genetic structure of species can be used to inform species management, tree improvement programs, conservation policy, and conservation activities. More than 80 Australian forest tree species have been examined over the past four decades for population genetic variation using molecular or non-molecular techniques (Lott and Read 2021).

The Genomics for Australian Plants Framework Initiative is an integrated network of researchers, data specialists, and state and national government agencies collaborating in the collection, management, dissemination and application of genomic data for Australian plants.

Investigation of the genetic basis of environmental plantings, and genetic variability of forest tree species regarding adaptation to climate change, can inform tree breeding strategies:

- *Eucalyptus salubris*, *E. tricarpa* and *E. loxophleba* ssp. *lissophloia* are widespread eucalypts with some capacity to respond to a changing climate, but targeted selection of seed sources to match projected climate changes may confer even greater climate resilience (Byrne et al. 2013).
- Over the last fifty years, *E. gunnii* ssp. *divaricata* in Tasmania has experienced extensive dieback and a shift in its regeneration niche to deeper soils, potentially as a result of an increase in maximum temperatures and a reduction in late summer/autumn rainfall. Provenance differences in response are under investigation (Prober et al. 2016).

Genomic data is being used to survey genetic variation that correlates with climate variables, to assist climate change-appropriate provenance selection. As examples, Jordan et al. (2017) found evidence of genomic adaptation to climate in *E. microcarpa*, while Butler et al. (2022) concluded that over 50% of the current distribution of *E. globulus* will be outside its modelled adaptive climatic range by 2070.

A national project commenced in December 2018 to map the genomes of Australian native plants to better understand and conserve the country's unique flora and support decision making. The initial pilot includes Australia's floral emblem, *Acacia pycnantha* (McLay et al. 2022).

International engagement and collaboration

There are international conventions or agreements directly and indirectly relevant to genetic resource conservation (Lott and Read 2021). Australia has adopted domestic measures for genetic resource conservation and management consistent with the *Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization*. This protocol establishes a framework that helps researchers and developers access genetic resources, and share benefits from genetic resources with the provider country. Indigenous and local communities may receive benefits through a legal framework that respects the value of traditional knowledge associated with genetic resources.

Some native forest species from Australia are a dominant part of the hardwood plantation industry in other countries. Australia collaborates with tree breeding scientists and forestry organisations in other countries, particularly those with similar climates or where Australian species are planted.

- The Queensland Department of Agriculture and Fisheries is collaborating with South Africa and Brazil on *Corymbia* species that are suitable for plantations in a range of ecosystems such as savannah and cerrado.
- The Forestry Program of the Australian Centre for International Agricultural Research (ACIAR) funds international collaborative projects in Indonesia, Papua New Guinea, Pacific islands, Vietnam, Laos, Nepal and Eastern Africa that address priority timber development themes, including germplasm conservation, improvement and distribution, and forest restoration, management and protection.

- The web-based genetic evaluation platform of Tree Breeding Australia also services tree breeding programs in China, France and Sweden, fostering international collaboration between tree breeding scientists on advanced-generation plantation species.

Supporting information for Indicator 1.3b: Native forest and plantations of indigenous timber species which have genetic resource conservation mechanisms in place

Tabular species data

Table 1.3b-1 lists the key native (indigenous) plantation species grown for timber (or essential oils) in Australia for which seed collections are available for research and commercial purposes (wild-collected seed or improved through tree breeding).

Table 1.3b-1: Key plantation species with reproductive material available in seed collections in Australia

Species	Type of seed material	Species	Type of seed material
Acacia auriculiformis	improved	*Eucalyptus argophloia*	improved
A. crassicarpa	improved	*E. astringens*	wild
A. mangium	improved	*E. benthamii*	improved
A. melanoxylon	improved	*E. biturbinata*	wild
Acacia other species	wild	*E. botryoides*	improved
Araucaria cunninghamii	improved	*E. camaldulensis* ssp. *simulata*	improved
Casuarina cunninghamiana	wild	*E. camaldulensis* var. *camaldulensis*	improved
C. obesa	wild	*E. camaldulensis* var. *obtusa*	improved
Casuarina other species	improved	*E. cladocalyx*	improved
Corymbia citriodora ssp. *citriodora*	improved	*E. cloeziana*	improved
C. citriodora ssp. *variegata*	improved	*E. dunnii*	improved
C. henryi	improved	*E. globulus*	improved
C. maculata	improved	*E. grandis*	improved
C. torelliana	cultivated	*E. kochii*	wild
Grevillea robusta	improved	*E. leucoxylon*	wild
Santalum album	cultivated, improved	*E. longirostrata*	wild
S. lanceolatum	improved	*E. moluccana*	wild
		E. nitens	improved
		E. occidentalis	improved
		E. pellita	improved
		E. pilularis	improved
		E. polybractea	improved
		E. saligna	improved
		E. sieberi	improved
		E. sideroxylon	wild
		E. smithii	improved
		E. tereticornis ssp. *tereticornis*	improved
		E. tricarpa	improved
		E. viminalis	wild

For species with wild seed, collections are from selected provenances. For species with improved seed, wild seed is also available.
Source: Lott and Read (2021). Data received from contributors December 2020 to February 2021 from organisations listed in Table 1.3b-2 in Supporting information for Indicator 1.3b, as well as the Australian Seed Bank Partnership, Nindethana Seeds, Northern Territory Department of Industry, Tourism and Trade, University of Tasmania, VicForests, Victorian Department of Environment, Land, Water and Planning, and Western Australian Department of Biodiversity, Conservation and Attractions.
This table lists formal seed collections of key plantation species grown for timber or essential oils, generally made from representative or high-quality trees from known provenances or parents, and stored in facilities under controlled conditions to maximise seed longevity. Table does not include species collected for genetic conservation, research, revegetation or international purposes; or seed collected for short-term use without long-term storage.

Table 1.3b-2 lists the active tree-breeding and/or improvement programs that exist for more than 27 native wood-producing and oil-producing species and varieties, including provenance (locality) or parentage of the seed, and the organisations that manage them for which trial data are available as at February 2021.

Table 1.3b-2: Key plantation species in active tree improvement or breeding programs in Australia

Species	Organisations
Corymbia citriodora ssp. *citriodora*	Queensland DAF
C. citriodora ssp. *variegata*	Australian Low Rainfall Tree Improvement Group[a], CSIRO, Queensland DAF, Seed Energy
C. henryi	CSIRO, Queensland DAF
C. maculata	CSIRO, Australian Low Rainfall Tree Improvement Group, Seed Energy
C. torelliana	Queensland DAF
Eucalyptus argophloia	Queensland DAF, CSIRO
E. benthamii	CSIRO, SeedEnergy
E. biturbinata	Queensland DAF
E. camaldulensis	Australian Low Rainfall Tree Improvement Group, CSIRO, Queensland DAF
E. cladocalyx	Australian Low Rainfall Tree Improvement Group, CSIRO, Seed Energy
E. cloeziana	Queensland DAF
E. dunnii	CSIRO/Forestry Corporation of NSW (jointly), SeedEnergy, Queensland DAF
E. globulus	Australian Bluegum Plantations, HVP Plantations, Tree Breeding Australia[b]
E. grandis	CSIRO, Queensland DAF
E. longirostrata	Queensland DAF
E. nitens	Forico, SeedEnergy, Sustainable Timber Tasmania, HVP Plantations
E. occidentalis	CSIRO, Australian Low Rainfall Tree Improvement Group
E. pilularis	Queensland DAF
E. polybractea	CSIRO, private industry
E. saligna	CSIRO
E. sideroxylon	Australian Low Rainfall Tree Improvement Group, CSIRO, Queensland DAF
E. smithii	Australian Bluegum Plantations, CSIRO, SeedEnergy, WA Plantation Resources
E. tereticornis	Queensland DAF
Grevillea robusta	CSIRO/Queensland DAF (jointly)
Santalum album	Queensland DAF, Quintis (not Australian provenances)
S. lanceolatum	University of the Sunshine Coast
S. spicatum	Forest Products Commission (WA)

CSIRO, Commonwealth Scientific and Industrial Research Organisation; DAF, Queensland Department of Agriculture and Fisheries.

[a] The Australian Low Rainfall Tree Improvement Group was formed in 1999 as a partnership between CSIRO and several industry and state forestry organisations in southern Australia. Although external funding ceased in 2009, a range of trials established under this group remain managed by the host organisations.

[b] Tree Breeding Australia partners in *E. globulus* breeding are Forico, PF Olsen, Sustainable Timber Tasmania, and WA Plantation Resources. Data as at February 2021.

Source: Lott and Read (2021). Information was sourced from replies to data requests sent to plantation owners and managers listed in this table as well as HQPlantations; Midway; Northern Territory Department of Industry, Tourism and Trade; University of Tasmania; VicForests, Victorian Department of Environment, Land, Water and Planning; and Western Australian Department of Biodiversity Conservation and Attractions.

Table 1.3b-3 lists the number of active tree improvement programs for key native plantation species for which trial data were available as at December 2020.

Table 1.3b-3: Tree improvement trials for main species in Australia under active management

Species	Plus trees [a]	Provenance trials		Progeny trials		Clonal testing and development	
		No. of trials	No. of provenances	No. of trials	No. of families	No. of tests	No. of clones
Araucaria cunninghamii[b]	876 first-generation	20	50	~100	~900	_	_
Corymbia hybrids	0	-	-	20	500	15	30
C. citriodora	n.a.	3*	~15	3*	~80	-	-
C. maculata	n.a.	7*	15	7*	150	-	-
Eucalyptus cloeziana	25	-	-	1	-	1	-
E. dunnii	100	-	-	8	467	-	-
E. globulus	n.a.	92	>29	149	~7721	>6	120
E. grandis	115	-	40	-	-	-	-
E. nitens	n.a.	4	3	55	3351	-	-
E. pilularis	352	-	-	2	300	-	-
E. polybractea	200	>3	>27	7	~356	1	12
E. smithii	-	3	-	6	~400	0	0
Eucalyptus hybrids	n.a.	4	-	3	154	-	-
Santalum album	-	1	1	5	120	-	-
S. lanceolatum	-	2	-	-	30	-	-
S. spicatum	-	1	6	1	100	-	-

-, not available; n.a., not applicable; *, combined provenance-progeny trial listed under both headings.

[a] Number of plus trees (superior trees) listed if program is beginning and only first-generation seed orchards have been established, or if the program is ending and only plus trees are retained.

[b] The breeding program for *Araucaria cunninghamii* is currently on hold. Data indicate number of trials as at 2016.

Data as at December 2020.

Source: Lott and Read (2021). Data based on consultation with organisations listed in Table 1.3b-2 in Supporting information for Indicator 1.3b, as well as Tree Breeding Australia and the Western Australian Department of Biodiversity, Conservation and Attractions.

Click here for a Microsoft Excel workbook of the data for Table 1.3b-3.

Table 1.3b-4 lists the range of species grown in seed orchards. This list contains more species than are represented in current tree improvement programs.

Table 1.3b-4: Plantation species in seed orchards in Australia

Species	Seed orchards		
	Number	Generation [a]	Area (hectares)
Araucaria cunninghamii [b]	5	2	18
Corymbia citriodora ssp. *citriodora*	1	1	2.3
C. citriodora ssp. *variegata*	10	1 and 1.5	27
C. henryi	3	1	3
C. maculata	9 (including 1 CSO)	1 or 2	15.1
C. torelliana	2	1	3
Eucalyptus argophloia	4 (including 1 SSO)	1 ,2	5.5
E. biturbinata	1	1	0.5
E. benthamii	5	1,2	~10
E. botryoides	2	1	0.8
E. camaldulensis	3	1	>1.8
E. cladocalyx	>15	1	19.4
E. cloeziana	2	1	7
E. dunnii	13 (including 1 CSO)	1,1.5	27.0
E. globulus	20	1-4	53.9
E. grandis	5	1, 1.5	9.0
E. kochii	22	1	-
E. loxophleba ssp. *lissophloia*	12	1	22.3
E. marginata	2	1	3.2
E. moluccana	1 CSO	n.a.	-
E. nitens	14	1-3	28.1
E. occidentalis	10	1	5.6
E. pilularis	5	1	15
E. polybractea	>18	1	>17.4
E. saligna	7	1	12.9
E. sideroxylon	3	1	2.4
E. smithii	3	1	7
E. tricarpa	5	1	4.1
Grevillea robusta	2	1,1.5	1.3
Santalum album [c]	5	1, 1.5	21
S. lanceolatum	2	1	0.4
S. spicatum	5	1	8.8

-, no data; CSO, clonal seed orchard; SSO, seedling seed orchard; n.a., not applicable.

[a] Generation refers to first, second, third, etc. breeding cycle in the seed orchard. An entry of 1.5 indicates the orchard is a mix of first-generation seed (wild seed) and improved seed from a first-generation seed orchard.

[b] *A. cunninghamii* data includes two new orchards currently being developed (yet to be fully grafted).

[c] *S. album* is native to northern Australia, Timor and India. The seed orchards in Australia are unlikely to contain any local provenances.

Data as at February 2020.

Source: Lott and Read (2021). Data based on consultation with organisations listed in Table 1.3b-2.

Click here for a Microsoft Excel workbook of the data for Table 1.3b-4.

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More information

Learn more about Criterion 1 of Australia's State of the Forests Report.

Web agriculture.gov.au/abares/forestsaustralia/sofr/

Download a Microsoft Excel workbook of the data presented in Indicator 1.3b.

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Acknowledgement of Country

We acknowledge the Traditional Custodians of Australia and their continuing connection to land and sea, waters, environment and community. We pay our respects to the Traditional Custodians of the lands we live and work on, their culture, and their Elders past and present.

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