



Draft Conservation Advice for the Araluen Scarp Grassy Forest

This draft document is being released for consultation on the description, listing eligibility and conservation actions of the ecological community.

The purpose of this consultation document is to elicit additional information to better understand the definition and status of the ecological community and help inform conservation actions. The draft assessment below should therefore be considered **tentative** at this stage, as it may change as a result of responses to this consultation process.

This document combines the conservation advice and listing assessment for the threatened ecological community. It provides a foundation for conservation action and further planning.



An example of Araluen Scarp Grassy Forest in the Neringla Valley, NSW © Nikki Ward

The Araluen Scarp Grassy Forest occurs within country (the traditional lands) of the Walbunja people of the Yuin Nation. We acknowledge their culture and continuing link to the ecological community and the country it inhabits.

Proposed Conservation Status

The Araluen Scarp Grassy Forest is proposed to be listed in the Endangered category of the threatened ecological communities list under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act).

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About this document

This document describes the ecological community and where it can be found (section 1.2); outlines information to assist in identifying the ecological community and important occurrences of it (section 2); and describes its cultural significance (section 3).

In line with the requirements of section 266B of the EPBC Act, it sets out the grounds on which the ecological community is eligible to be listed as threatened (section 6); outlines the main factors that cause it to be eligible for listing (section 4); and provides information about what could appropriately be done to stop its decline and/or support its recovery (section 5).

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1 Ecological community name and description

1.1 Name

The name of this ecological community is the Araluen Scarp Grassy Forest. The name refers to the geographic area (the scarp slopes of the Araluen area in south-eastern New South Wales) and the vegetation structure (a grassy forest) of the community.

The ecological community was originally placed on the 2020 Finalised Priority Assessment List as the “Araluen Scarp Grassy Forest of the South East Corner Bioregion”.

Consultation Questions on the Name

- Do you agree with the proposed name of the ecological community? If not, please propose an alternative and explain your reasoning.

1.2 Description of the ecological community and the area it inhabits

The EPBC Act defines an ecological community as an assemblage of native species that inhabits a particular area in nature. This section describes the species assemblage and area in nature that comprises the Araluen Scarp Grassy Forest.

The ecological community described in this conservation advice is the assemblage of plants, animals and other organisms associated with a type of temperate vegetation dominated by *Eucalyptus* species, found in the vicinity of Araluen Valley, New South Wales (NSW). It is an open forest or woodland with a canopy dominated by several species of eucalypts, an open small tree and shrub layer and a grassy ground cover, with climbers present in the lower layers. A key feature of this community is the presence of flora associated with dry rainforest or rainforest fringes/wet sclerophyll forest.

This section describes the range of natural states of the ecological community. More information to assist in identifying patches of the ecological community is provided in [section 2](#). Because of past loss or degradation, not all current patches of the ecological community are in a completely natural state. [Section 2.3](#) provides information to identify which patches retain sufficient conservation values to be considered a matter of national environmental significance.

1.2.1 Location and physical environment

Araluen Scarp Grassy Forest occurs in the Araluen and surrounding valleys primarily within the IBRA¹ South East Corner Bioregion, and secondarily within the South Eastern Highlands Bioregion. At sub-bioregional scale, Araluen Scarp Grassy Forest occurs primarily within the

¹ Interim Biogeographical Regionalisation of Australia Version 7 (DoE 2012)

South East Coastal Ranges and secondarily within the Bateman and Kybeyan-Gourock sub-regions.

This community occurs on escarpment slopes and ridges, often on steep northerly, easterly, southerly and westerly aspects, and does not typically occur on north-westerly aspects. This community occurs on sandy loam soils derived typically from granite, primarily Dermosols, Kandosols and Kurosols (DPIE, 2021a). The majority of the community occurs between elevations of 180–330 metres above sea level (ASL), but it may extend up to approximately 900 metres ASL.

The majority of the ecological community falls within in a rain shadow with mean annual rainfall between approximately 890 mm to 1050 mm per annum, but patches closer to the coast may occur in areas where mean annual rainfall reaches up to 1300 mm. The ecological community falls within a mean annual temperature range of approximately 11.5°C to 15°C.

Consultation Questions on the location and physical environment

- Do you agree with the proposed location, physical environment and boundaries for the ecological community? If not please provide your reasons and provide any supporting evidence.
- Does the altitude range, slope profile and described soils accurately capture the full range where this ecological community can be found?

1.2.2 Description of the assemblage

1.2.2.1 VEGETATION STRUCTURE

Araluen Scarp Grassy Forests are typically up to 20 metres tall with sparse to moderate canopy cover, consisting of *Eucalyptus* or *Angophora* species. Sites located on lower slopes near valley bottoms may contain larger emergent trees. Below the canopy is a sparse understorey of small trees and shrubs between 2 to 10 metres tall, with sparse to moderate small tree and shrub cover. The sparse to moderately dense ground layer contains grasses, forbs and climbers interspersed with leaf litter. Fungi and other cryptogams are also common.

1.2.2.2 FLORA

1.2.2.2.1 Canopy species

The characteristic canopy species are *Eucalyptus maidenii*, *E. melliodora*, *E. tereticornis*, and *Angophora floribunda*. Other *Eucalyptus* species may also be common in the canopy, including *E. kartzoffiana* which is found in more sheltered sites and listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* and *NSW Biodiversity Conservation Act 2016*. Varying proportions of these species are expected to be present at most sites, in association with less frequently occurring *Eucalyptus* species (see Appendix A - Species lists). Where rainforest species (e.g., *Ficus* spp.) are the dominant component of the canopy layer, this is not considered to be part of the ecological community (See Appendix B - Relationship to other vegetation classification and mapping systems).

A more comprehensive list of canopy species likely to occur in the ecological community, are in Appendix A - Species lists.

1.2.2.2.2 Understorey species – Mid Layer

Below the canopy is a sparse stratum of small trees and shrubs such as *Acacia mearnsii*, *Hymenanthera dentata*, *Pittosporum undulatum* and occasionally *Ficus rubiginosa*. *Bursaria spinosa* may also be present. Characteristic climbing species include *Pandorea pandorana*, *Geitonoplesium cymosum* and *Clematis glycinoides* var. *glycinoides*.

A more comprehensive list of understorey species likely to occur in the ecological community are in Appendix A - Species lists.

1.2.2.2.3 Understorey species – Ground Layer

The ground layer may vary from sparse in drier periods or to almost complete coverage following wetter than average periods. Rock outcrops may break up the continuity of the ground layer. The ground layer consists of a variety of forbs, such as *Desmodium varians*, *Dichondra* spp., *Oxalis perennans* and *Sigesbeckia orientalis* subsp. *orientalis*, with a number of grass species such as *Microlaena stipoides*, *Desmodium varians*, *Oplismenus imbecillis*, and fern species (e.g. *Pellaea falcata*, *Cheilanthes sieberi*) usually present.

A more comprehensive list of understorey species likely to occur in the ecological community are in Appendix A - Species lists.

1.2.2.3 FAUNA

Fauna play key roles in decomposition, nutrient cycling, pollination, seed dispersal and pest control within the ecological community. Fauna are dependent on the habitat and resources provided by the plant community and other features such as rocky outcrops. Araluen Scarp Grassy Forest grows in association with grassy woodlands and wet sclerophyll forest, containing elements of both, and thus includes a wide range of mammals, birds, reptiles, amphibians and invertebrates.

Araluen Scarp Grassy Forest is typically found on the slopes and escarpments above Araluen Valley, providing optimal perching and hunting sites for birds of prey such as *Aquila audax* (Wedge-tailed Eagle). Large emergent eucalypts typical of the lower slopes in this ecological community likely provide ideal nesting sites for Australia's largest bird of prey.

A large diversity of eucalypt species provides variety of habitat and resources for arboreal marsupials such as the *Petauroides volans* (Greater Glider) and *Phascolarctos cinereus* (Koala). This diversity also likely provides staggered canopy flowering times across the year, and thus a reliable food source for nomadic nectar-feeding fauna, including threatened species such as *Pteropus poliocephalus* (Grey-headed Flying Fox), *Anthochaera phrygia* (Regent Honeyeater) and *Lathamus discolor* (Swift Parrot). Bark-gleaners such as *Daphoenositta chrysoptera* (Varied Sittella) and *Cormobates leucophaea* (White-throated Treecreeper) may be seen spiralling up or down eucalypt stems.

The understorey provides variable habitat and resources for passerines such as *Acanthiza spp.* (Thornbills), *Petroica spp* and *Eopsaltria spp* (Robins), *Malurus spp* and *Sericornis spp.* (Wrens) and *Rhipidura spp* (Fantails). *Colluricincla harmonica* (Grey Shrike-thrush) and *Pardalotus punctatus* (Spotted Pardalote) are also frequently encountered within the ecological community. The diversity of grasses and abundant leaf litter support healthy populations of invertebrates and reptiles, such as *Pseudemoia entrecasteauxii* (Tussock Cool-skink). The sand, loamy soils are also likely to provide habitat for *Heleioporus australiacus* (Giant Burrowing Frog).

Araluen Scarp Grassy Forest also includes nocturnal predators, such as *Ninox spp.* (owls) and *Dasyurus maculatus* (Spotted-Tail or Tiger Quoll) that feed on smaller animals.

For a period of time following fire, a number of fauna species may be absent due to shortage of resources and/or mortality. For example, nectar and fruit feeding birds and mammals may not return to a site until resprouting plants have completed their secondary juvenile phase and become reproductively active. Species that rely on the resources produced by non-resprouting plants may likewise be rare or absent until such plants reach maturity.

A more comprehensive list of fauna species likely to occur in the ecological community, including threatened fauna, are in Appendix A - Species lists.

Consultation Questions on the species assemblage

- Do you agree with the vegetation description? If not, how can it be clarified?
- Are there any flora species that you think should be removed, added or described differently to accurately represent the proposed ecological community? The focus should be on characteristic, functionally significant &/or commonly occurring species. Please provide your reasons (and references if available).
- Are there any understorey species that are particularly characteristic? Particularly in comparison to adjacent woodland/forests with similar canopy species?
- Do you agree with the fauna information? If not, how can it be clarified?
- Is there additional information on fauna you would like to see included, particularly commonly encountered fauna, characteristic invertebrates and with relation to the ecological function of the community?
- Are there any narrowly endemic fauna or threatened fauna you know of that may occur in the ecological community?

1.2.3 Functionally important species within the ecological community

Consultation Questions on the functionally important species

- All species within the ecological community play a role, but do you know of any functionally important species that play a major role in sustaining the ecological community? If so, could you please identify them for us and suggest any key references you know of that support their role in the ecological community.

1.2.4 Relevant biology and ecology

1.2.4.1 FIRE ECOLOGY

Araluen Scarp Grassy Forest is distinguished from the adjacent Araluen Valley Grassy Woodland and Southern Tablelands Flats Forest by the common presence of flora associated with moist sheltered sites and rainforests (for example *Clematis glycinoides* var. *glycinoides*, *Ficus rubiginosa*, *Marsdenia rostrata*, *Melicytus dentatus*, *Pandorea pandorana*, *Pellaea falcata*, *Pittosporum undulatum*, *Plectranthus parviflorus* and *Sigesbeckia orientalis* subsp. *orientalis*). The persistence of these species may depend on a combination of infrequent fire (see [section 6.2.2](#) for details), as well as lower exposure to solar radiation and dry westerly continental winds.

Many plant species known to occur within Araluen Scarp Grassy Forest are capable of resprouting following fire (see Appendix A - Species lists). However, resprouting success depends on the level of damage sustained during fire (or accumulated over multiple fires), which is influenced by fire severity, fire frequency and plant characteristics such as stem diameter and bark thickness/bark type (Denham et al., 2016, Nolan et al., 2020b). Severe drought preceding or following fire may result in resource depletion that damages tree canopies and exacerbates the effects of fire (Enright et al., 2015, Matusick et al., 2013). Variability in vegetation structure is likely to be observed in fire-affected sites for several years post-fire, including completely top-killed or partially killed shrubs and trees that may be regenerating, resulting in variable canopy and understorey cover. Where fire has been less severe, eucalypt tree canopies may be unaffected (Trouvé et al., 2021). Consideration should be given to disturbance-driven variability of vegetation cover as legacies may persist for one or more decades following disturbance (Haslem et al., 2016, Karna et al., 2019, Collins et al., 2021b). The effects of fire regimes and interactions with regional climatic, topoclimatic and edaphic conditions on vegetation composition and structure, will have implications for faunal species composition and population dynamics via effects on resource availability, habitat suitability and predator-prey interactions (DAWE, 2021c).

Araluen Scarp Grassy Forest may contain several understorey species that are not equipped with post-fire regenerative organs. In addition, some species are known to resprout from the base-only (see Appendix A - Species lists). There are also several species where resprouting status is unknown (see Appendix A - Species lists). Araluen Scarp Grassy Forest may temporarily resemble an alternative state to that which is described in [section 1.2.2.1](#), as the structural complexity and vertical height of the lower layers may be reduced. In areas where consecutive fires have occurred at short intervals, non-resprouting species may be absent, as these species must complete the primary juvenile phase after each fire and rely on soil-stored or canopy-stored seed to persist (Bowman et al., 2013, Fairman et al., 2016). Thus, the fire-sensitive species found in Araluen Scarp Grassy Forest may not persist under a frequent fire regime or may experience difficulties recolonising after extensive fire. Vegetation types that contain mesic, fire-sensitive species are likely at higher risk of local extirpations of species than other vegetation types (Fairman et al., 2016, Clarke et al., 2009).

Further, the presence of species in this community that are typically associated with moist, sheltered sites is likely to be partly related to fire regime. The majority of Araluen Scarp Grassy Forest occurs on south- and east-facing slopes, which suggests that the community typically experiences low-intensity fire, e.g., fires that do not often consume the canopy. The dominant fire regime in the community is likely to be characterised by long inter-fire-intervals, and fire severity that varies with weather conditions. These longer intervals and variable fire intensity are likely to be key factors in the development of the mesic understorey elements that characterise the community.

Consultation Questions on the relevant biology and ecology

- Are there any relevant functional biology and ecology elements you think are important to include in this document? If so, please explain your reasons and provide any supporting evidence or references you have.
- Araluen Scarp Grassy Forest is likely to have large amounts of long unburnt vegetation, according to the fire history data. This, combined with the fact that not much logging or clearing has occurred, would imply that the community may have stands of old growth forest, and subsequently lots of tree hollows/logs etc. Do you have any information to support this or identify where such stands may occur?

2 Identifying areas of the ecological community

Section 1.2 describes this ecological community and the area it inhabits. This section provides additional information to assist with the identification of the ecological community and important occurrences of it.

Araluen Scarp Grassy Forest intergrades with grassy woodland as the scarp transitions to the colluvial and alluvial valley floor below, and grassy or wet sclerophyll forest above the escarpment (see section 2.2.6). Key diagnostic characteristics are used to identify an area of native vegetation as being the Araluen Scarp Grassy Forest, and define the features that distinguish it from other communities, noting that additional information to assist with identification is provided in the other sections of this document, particularly the description (section 1.2) and Appendix A - Species lists.

2.1 Key diagnostic characteristics

The key diagnostic characteristics are designed to allow identification of the ecological community irrespective of the season.

Areas of vegetation that do not meet the key diagnostics are not the nationally listed ecological community.

The ecological community is defined as areas matching the description in [section 1.2](#) that meet the following key diagnostic characteristics:

- Occurs in New South Wales within the South East Corner Bioregion or South Eastern Highlands Bioregion²;
- Occurs on steep scarp slopes and adjacent ridges;
- Occurs typically on sandy loam soils, derived from granite parent material. The relevant types in the Australian Soil Classification (DPIE, 2021a) is Dermosols, Kandosols and Kurosols³;
- Has a tree canopy with cover of 20 to 50%⁴, dominated by *Eucalyptus* species and sometimes *Angophora floribunda*. One of the following species must be present: *Eucalyptus melliodora*, *E. maidenii*, *Eucalyptus tereticornis*, *Angophora floribunda*;
- Has a sparse understorey⁵ of small trees, soft-leaved shrubs and climbers, often containing species associated with rainforests such as *Ficus rubiginosa*, *Melicytus dentatus*, *Pandorea pandorana*, *Pellaea falcata*, *Pittosporum undulatum* and *Plectranthus parviflorus*; and
- Usually has an open, patchy grassy ground cover, with cover less than 60%⁶, often interspersed with leaf litter and/or rocks, although coverage may reach 100% following wetter than average periods.

² Interim Biogeographical Regionalisation of Australia Version 7 (DoE 2012)

³ A small proportion of the community occurs on other soil classifications such as Calcarosols, Ferrosols or Sodosols. Therefore, if all other diagnostics are met, but the soil classification is not Dermosols, Kandosols or Kurosols, the community may still be present. In this case, check for granitic parent material and sandy-loam soil consistency.

⁴ Recent disturbance, such as fire, may remove the living canopy and cause a shift to a regenerative state. Under these circumstances, the loss is likely to be a temporary phenomenon, if natural regeneration is not disrupted. This temporary regenerative state is included as part of the ecological community when the other key diagnostic characteristics are met, even when crown cover is temporarily less than 20%. In these cases, there should be evidence that the canopy species will regenerate from seedlings, saplings, lignotubers or from epicormic regrowth. See [section 1.2.2.2](#) for more information.

⁵ Understorey refers to the vegetation strata below the canopy layer but does not include the ground layer (e.g. grasses, forbs, etc.). Note that climbers may be found across multiple strata.

⁶ Where ground cover is higher than approximately 50% and canopy tree cover is lower than approximately 30%, cross-checking with descriptions for Lowland Grassy Woodland and Southern Tableland Flats Forest is required. See [1.2.2.2](#) and [Appendix B - Relationship to other vegetation classification and mapping systems for details](#).

Consultation Questions on the key diagnostic characteristics

- Do you agree that these statements will clearly identify when the ecological community is present?
- Are the key diagnostic characteristics sufficient to differentiate the ecological community from other ecological communities? If not, how should they be modified?

2.2 Additional information to assist in identifying the ecological community

The following information should also be taken into consideration when applying the key diagnostic characteristics to assess if a site may include the ecological community.

2.2.1 *Identifying a patch*

A patch is a discrete and mostly continuous area of the ecological community, as defined by the key diagnostics, but can include small-scale variations, gaps and disturbances within this area. The smallest patch size that can be identified is 0.1 ha, as the key diagnostics cannot reliably be identified for smaller areas than this. Where a larger area has been mapped or classified as a different vegetation type, localised areas of the Araluen Scarp Grassy Forest greater than 0.1 ha may be present within this larger area.

2.2.2 *Breaks in a patch*

When it comes to defining a patch of the ecological community allowances are made for “breaks” up to 30 metres between areas that meet the key diagnostics. Such breaks may be the result of watercourses or drainage lines, fence lines, tracks, paths, roads, powerline easements or other gaps presenting as areas of water, rocks, exposed soil, leaf litter or cryptogams, and areas of localised variation in vegetation that do not meet the key diagnostics. For example, a single patch could include two areas of the ecological community that meet the key diagnostics, but which are separated by a narrow strip of riparian vegetation lining a watercourse. Such breaks do not significantly alter the overall functionality of the ecological community and form a part of the patch. Watercourses or drainage lines, gaps made by exposed areas of soil, leaf litter or cryptogams, and areas of localised variation in vegetation should be included in the calculation of the size of the patch and be taken into account when determining the overall condition of the patch. Tracks, paths, roads or other man-made surfaces should be excluded from the calculation of patch size and condition.

Where there is a break in the ecological community of 30 metres or more (e.g. due to permanent artificial structures, wide roads or other barriers, water bodies or other types of vegetation) then the gap indicates that separate patches are present.

2.2.3 *Variation within a patch*

Patches of the ecological community may contain areas that vary in structural or biological characteristics. For example, the sparse nature of the understorey of Araluen Scarp Grassy Forest means that some diagnostic species may not always be present in parts of a patch. Species that are sensitive to disturbance (such as fire sensitive obligate seeder species) may

also be absent for a time after disturbance. Variation in vegetation across a patch should not be considered to be evidence of multiple patches, so long as it meets the key diagnostics.

2.2.4 *Revegetation and regrowth*

Revegetated or replanted sites or areas of regrowth are not excluded from the listed ecological community so long as the patch meets the key diagnostic characteristics.

Where ecological restoration is planned, the aim should be for recovery of as many key biodiversity and ecosystem attributes as practical for a particular site, so that the ecological community is on a trajectory to recovery and is self-sustaining. This should be based on identifying appropriate reference site(s) for the ecological community following the *National Standards for the Practice of Ecological Restoration in Australia* (Standards Reference Group SERA 2021).

2.2.5 *Survey requirements*

Patches of the ecological community can vary markedly in their shape, size, condition and features. Thorough and representative on-ground surveys are essential to accurately assess the extent and condition of a patch. The Australian Soil and Land Survey Field Handbook (National Committee on Soil and Terrain, 2009) and New South Wales BioNet Vegetation Classification User Manual (NSW Office of Environment and Heritage 2018) may provide guidance.

The size, number and spatial distribution of plots or transects must be adequate to represent variation across the patch. Sampling should address likely variation in species composition and significant variation in the vegetation (including areas of different condition), landscape qualities and management history (where known) across the patch.

Recording the search effort (identifying the number of person hours spent per plot/transect and across the entire patch; along with the surveyor's level of expertise and limitations at the time of survey) is useful for future reference.

Whilst identifying the ecological community and its condition is possible at most times of the year, consideration must be given to the role that season, rainfall and disturbance history may play in an assessment. For example, following fire, one or more vegetation layers, or groups of species (e.g. obligate seeders), may not be evident for a time (see Appendix A - Species lists). Timing of surveys should allow for a reasonable interval after a disturbance (natural or human-induced) to allow for regeneration of species to become evident and be timed to enable diagnostic species to be identified. At a minimum, it is important to note climate conditions and what kind of disturbance may have happened within a patch, and when that disturbance occurred.

2.2.6 *Consideration of fire effects on community appearance*

The fire history of a site should be given consideration during survey, as Araluen Scarp Grassy Forest may appear simplified and potentially similar to adjacent vegetation types such

as Lowland Grassy Woodland and Southern Tablelands Flats Forest where fires have occurred at short intervals.

Where there is difficulty in distinguishing recently or frequently burnt Araluen Scarp Grassy Forest from grassy woodlands or tableland forests the following points should also be considered:

- While there is crossover of these communities on steep granitic slopes, Araluen Scarp Grassy Forest is unlikely to occur on flatter lower-lying terrain, where Lowland Grassy Woodland is predominant, or upon tablelands west of the ridges bounding the Araluen Valley (Tozer et al., 2010; NSW Scientific Committee, 2011);
- Araluen Scarp Grassy Forest is likely to have a higher cover of trees (20 to 50%) and less ground cover (10 to 65%) than Lowland Grassy Woodland (trees: 10 to 40%; ground cover: 40 to 90%) or Southern Tableland Flats Forest (trees: 20 to 40%; ground cover: 25 to 85%, Tozer et al., 2011).

2.2.7 Mapping and vegetation classifications

There are several mapping and vegetation classification schemes used in NSW. Although none directly map areas of the ecological community according to the key diagnostics, they can still provide useful information on the likely occurrence of the ecological community. Appendix B - Relationship to other vegetation classification and mapping systems outlines the map units or classifications from several common mapping and classification systems that best relate to the ecological community.

2.2.8 Other relevant listed ecological communities

Araluen Scarp Grassy Forest is very similar to the New South Wales listed “Araluen Scarp Grassy Forest in the South East Corner Bioregion”. The ecological community in this conservation advice is mostly equivalent to the NSW listing.

There are also other NSW or nationally-listed threatened ecological communities that occur in, or close to, the same areas as the Araluen Scarp Grassy Forest. These include:

- Brogo Wet Vine Forest of the South East Corner Bioregion (currently under assessment) – also listed in NSW as the Brogo Wet Vine Forest in the South East Corner Bioregion. This community occurs further south and does not overlap with the known distribution of Araluen Scarp Grassy Forest.
- Lowland Grassy Woodland in the South East Corner Bioregion (critically endangered) – also listed in NSW. This community occurs in the flatter valley floors, has greater grass cover and does not contain the rainforest elements that are associated with Araluen Scarp Grassy Forest.

- Illawarra and South Coast Lowland Forest and Woodland (critically endangered) – also listed in NSW as the Illawarra Lowlands Grassy Woodland in the Sydney Basin Bioregion.
- River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria (critically endangered) – largely equivalent to the River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions listed in NSW. This community may share similar species to Araluen Scarp Grassy Forest, but is restricted to alluvial flats, edges of waterways and floodplain margins, mostly less than 50 metres ASL (up to 250 m).
- Natural Temperate Grassland of the South Eastern Highlands (critically endangered) – also in listed NSW. This community occurs largely west of the known distribution of Araluen Scarp Grassy Forest on undulating tablelands and is characterised by dense tussock grasses and very few trees.
- Dry Rainforest of the South East Forests in the South East Corner Bioregion - listed in NSW. This community can be distinguished from the Araluen Scarp Grassy Forest by the dominance of *Ficus rubiginosa*, which forms a dense, closed canopy.

Consultation Questions on the additional identification information

- How could we improve on the information provided to assist with identifying the ecological community?
- Is 0.1ha appropriate as a size threshold for the smallest patch size of the ecological community that can be identified?
- Please comment on survey requirements, including post fire survey. E.g. are there state or local guides?
- Is the list of corresponding map units complete and accurate?
- Vegetation mapping indicates there are potentially a number of small, disjunct patches of the community at sites located along estuaries/waterways near the coast in the Bateman subregion, where rainfall is substantially higher than in the Araluen Valley. Are these likely to be part of the same community or should they be excluded?
- Have all relevant listed ecological communities been included?

2.3 Condition classes, categories and thresholds

Land use and disturbance history will influence the state and condition in which a patch of the ecological community is currently expressed. National listing focuses legal protection on patches of the ecological community that are the most functional and in comparatively good condition. These patches are identified through *minimum condition thresholds*.

Condition classes are also used to distinguish between patches of the ecological community of different qualities, to aid environmental management decisions.

In order to be protected as a matter of national environmental significance areas of the ecological community must meet both:

- the key diagnostic characteristics ([section 2.1](#)) AND
- at least the minimum condition thresholds (Table 1).

Table 1 outlines the different condition classes that apply to the ecological community. The minimum condition thresholds are designed to identify those patches that retain sufficient conservation values to be considered a matter of national environmental significance, to which the referral, assessment, approval and compliance provisions of the EPBC Act apply. These include all patches in Classes A, B, and C.

Patches that do not meet the minimum condition thresholds for at least Class C are excluded from protection under the EPBC Act. In many cases, the loss and degradation are irreversible because natural characteristics have been permanently removed. However, although not protected under the EPBC Act, many of these patches may still retain important natural values and may be protected through state and local laws or planning schemes.

In addition, patches that can be restored should not be excluded from recovery and other management actions. Suitable recovery and management actions may improve a patch's condition, such that it subsequently can be included as part of the ecological community fully protected under the EPBC Act. Management actions should be designed to restore patches to high quality condition where practical.

When assessing condition of a patch of the ecological community it is important to also consider the key diagnostics ([section 2.1](#)) and patch definition information ([section 2.2](#)).

Recent disturbance by fire is likely to result in the ecological community presenting in a temporarily altered state that may include severely reduced canopy cover, simplified vegetation structure, resprouting trees and shrubs that have been partially or completely topkilled and may lack several obligate seeder species that must complete the primary juvenile phase following fire. This condition is likely to be temporary and if effects are severe consider postponing survey for several years, or else projections should be made by inference from species life histories.

Table 1: Condition classes and thresholds

<div><div>Patch size threshold →</div><div>Biotic thresholds ↓</div></div>	Large patch ≥ 1 ha	Small contiguous patch ³ ≥ 0.1 ha within an area of native vegetation ≥ 2 ha	Small patch ≥ 0.1 ha
<div><div>High condition</div><div>Total of ≥ 11 native understorey/ground layer¹ species per plot²</div><div>AND</div><div>Total of ≥ 80% understorey/ground layer¹ plant cover per plot² is native species</div></div>	<div><div>CLASS A1</div><div>Large or contiguous patch in high condition</div></div>	<div><div>CLASS B1</div><div>Small patch in high condition</div></div>	
<div><div>Good condition</div><div>Total of ≥ 8 native understorey/ground layer¹ species per plot²</div><div>AND</div><div>Total of ≥ 50% understorey/ground layer¹ plant cover per plot² is native species</div></div>	<div><div>CLASS B2</div><div>Large or contiguous patch in good condition</div></div>	<div><div>CLASS C1</div><div>Small patch in good condition</div></div>	
<div><div>Moderate condition</div><div>Total of ≥ 5 native understorey/ground layer¹ species per plot²</div><div>AND</div><div>> 30% total understorey/ground layer¹ plant cover per plot² is native species</div></div>	<div><div>CLASS C2</div><div>Large of contiguous patch in moderate condition</div></div>	<div><div>Not protected</div></div>	
<div><div>¹Understorey/ground layer is inclusive of all flora below canopy layer, including both the juvenile forms of canopy species and fire/drought-affected canopy trees that are resprouting.</div><div>²The minimum acceptable plot size is 0.04 ha</div><div>³Contiguous patches are connected to other patches of native vegetation, or are within 30 m of other native vegetation</div></div>			

Consultation Questions on the condition classes, categories and thresholds

- How can we improve on the proposed condition information?
- Are the proposed *measures* (understorey species richness, weediness) appropriate to distinguish between patches of different condition?
- Are the proposed *thresholds* for these measures appropriate to distinguish the different condition classes?

2.4 Habitat critical to the survival of the ecological community

The habitat or areas most critical to the survival of the ecological community are those patches that are in the best condition (i.e. Classes A and B in Table 1). These represent those parts of the ecological community closest to the benchmark state of the ecological community; they are the patches that retain the highest diversity and most intact structure and ecological function and have the highest chance of persisting in the long-term.

However, other patches (i.e. Class C or lower in Table 1) may occur in locations or landscape positions that are particularly important for biodiversity or function and/or may contain suites of species or habitat features that are important in a regional or local context (see Section 2.5). Hence these areas can still be critical to the survival of the ecological community may be ideal targets for ecological restoration programs.

Consultation Questions on the habitat critical to the survival

- Can you provide any information on particular locations or habitat that would be *critical* to the survival of this ecological community?

2.5 Areas of high value - surrounding environment and landscape context

For natural resource management activities or actions that may have ‘significant impacts’ and require approval under the EPBC Act, it is important to consider the whole environment surrounding patches of the ecological community. Patches of the ecological community do not occur in isolation. The surrounding vegetation and other landscape considerations will also influence how important a patch is to the ecological community as a whole.

Patches that are larger and less disturbed are likely to provide greater biodiversity value. Patches that are spatially linked, whether ecologically or by proximity, are particularly important as wildlife habitat and to the viability of those patches of the ecological community into the future. However, this still does not necessarily consider the full landscape context. For example, in heavily cleared areas, some patches that meet the minimum condition thresholds occur in isolation. Such patches require protection and could benefit from revegetation activities to link them with other patches. In other areas, patches that are interconnected to other native vegetation may not, in their current state, meet the minimum condition thresholds, but have high conservation value. Such patches could benefit from restoration works to improve their condition so that they do meet the minimum condition thresholds.

The ecological community often occurs in association with other native vegetation types. Patches of the ecological community that remain connected with other native vegetation have a better chance of future survival and restoration success, because connected patches are buffered from disturbance by the surrounding native vegetation.

The following indicators of high-value should be considered when assessing the impacts of proposed actions under the EPBC Act, or when determining priorities for protection, recovery, management and funding.

- Patches that meet, or are closest to the high quality (Class A) condition for this ecological community. These may be based on on-site observations or known past management history.
- Patches with a larger area to boundary ratio – such patches are more resilient to edge effect disturbances such as weed invasion and human impacts.
- Patches within or near to a larger native vegetation remnant and that contribute to a mosaic of vegetation types present at a site. Areas of mosaic native vegetation provide a wider range of habitats that benefit flora and fauna diversity. Other patches are important as linkages among remnants, acting as ‘stepping stones’ of native remnants

in the landscape. Connectivity includes actual or potential connectivity to restoration works (e.g. native plantings).

- Patches that occur adjacent to other vegetation types that contain rainforest/mesic forest elements. Dispersal of rainforest/mesic species into Araluen Scarp Grassy Forest may be an important ecological process, especially following major or short-interval disturbances where more sensitive species may have been depleted.
- Patches that occur in areas where the ecological community has been most heavily cleared and degraded such as lower slopes or low-lying flatter areas, which may contain large, mature trees.
- Patches that are at the natural edge of its range, particularly where there is genetic distinction, or absence of some threats. These may include unique variants of the ecological community, e.g. with a unique flora and/or fauna composition, or a patch that contains flora or fauna that have largely declined across the broader ecological community or region.
- Patches that show evidence of recruitment of key native plant species or the presence of a range of age cohorts (including through successful assisted regeneration or management of sites).
- Patches with good faunal habitat as indicated by diversity of landscape, diversity of plant species and vegetation structure, diversity of age class, presence of movement corridors, mature trees (particularly those with hollows), logs, watercourses, etc.
- Patches containing nationally or state-listed threatened species.
- Patches with high species richness, as shown by the variety of native understorey plant species, or high number of native fauna species (vertebrates and/or invertebrates).
- Patches with relatively low levels of weeds and feral animals or areas where these can be managed efficiently.
- Patches that do not experience grazing or show low-levels of disturbance caused by grazing by domestic livestock or feral herbivores.
- Patches that do not contain mine diggings or mining-associated impacts such as vehicle tracks and water pollution.

Consultation Questions on the areas of high value

- Can you provide any additional information on qualities that would denote areas of particularly high conservation value?

3 Cultural significance

The Araluen Scarp Grassy Forest occurs within country (the traditional lands) of the Walbunja people of the Yuin Nation. We acknowledge their culture and continuing link to the ecological community and the country it inhabits.

The significance of the ecological community, particular species, spiritual and other cultural values are diverse and varied for the Indigenous peoples that live in the vicinity and care for Country. This section describes some examples of this significance but is not intended to be comprehensive or applicable to, or speak for, all Indigenous people. Such knowledge may be only held by Indigenous groups and individuals who are the custodians of this knowledge.

Consultation is ongoing, and we are seeking feedback from Traditional Owners on Indigenous cultural values, preferred ways to present the information, as well as permissions to include such information. Information included in the Conservation Advice can highlight cultural values and inform future management.

For millennia the Yuin People have lived along the Deua River and in the surrounding catchment area, which includes Majors Creek State Conservation Area, Berlang State Conservation Area and Frogs Hole Nature Reserve (NSW NPWS, 2019). There are specific cultural rituals and general cultural activities that are related to this area (NSW NPWS, 2019). The slopes and escarpments of the Araluen Valley where the ecological community occurs provide important physical links between the coastline and tablelands, enabling movement for social, cultural and practical purposes (NSW NPWS, 2019).

Several plants have been identified within Araluen Scarp Grassy Forest that are utilised as food sources or for materials by Aboriginal communities, including *Geitonoplesium cymosum*, *Lomandra longifolia*, *Plantago debilis*, *Ficus rubiginosa*, *Einadia* spp., *Daucus glochidiatus*, *Arthropodium minus* (Caton and Hardwick, 2016).

Consultation Questions on the cultural significance

For Traditional Custodians:

- Do you have any information you are willing to share about the cultural significance of the ecological community, forests in the area generally or the country that supports the ecological community?
- Do you know any people or organisations we could contact in the region who may have information they are willing to share?
- Do you know of any books, articles or online resources about Yuin Peoples relationships with forests or the landscape you think would be sources of appropriate information?

4 Threats

Araluen Scarp Grassy Forest has been primarily impacted by land clearing, overgrazing from domestic and feral animals (particularly goats), changes to fire and drought regimes, timber and mineral extraction and invasion by weeds.

4.1 Threat table

Table 2 outlines the key threats facing the ecological community. The key threats faced by the ecological community are described to help explain why this ecological community merits listing as threatened and supports the assessment against the criteria at section 6. Although presented as a list, in reality these threats often interact, rather than act independently.

Table 2: Summary of threats facing the ecological community

Threat	Threat Status*	Threat impacts
Fire regimes which cause biodiversity decline	Timing: ongoing Severity: major Scope: whole	The majority (approximately 68%) of Araluen Scarp Grassy Forest has not experienced wildfire or planned since the beginning of reliable fire history record keeping in NSW (e.g. 1970 onwards; NPWS, 2021), or has experienced only one fire, almost entirely during the 2019 – 2020 fire season. Around 26% of the ecological community burnt during the 2019–2020 fire season, with around two-thirds of this burning at high or very high fire severity. Extreme fire impacts and changes to fire regime are a potential threat to the persistence of Araluen Scarp Grassy Forest. It is likely that consecutive short intervals fires have the capacity to fundamentally alter the community composition and vegetation structure of temperate eucalypt forests such as Araluen Scarp Grassy Forest, in particular, loss or decline of understorey elements (NSW NPWS, 2011, Fairman et al., 2016, Nolan et al., 2021a, Kenny et al., 2004, DAWE, 2021c). Other climate-change related changes to fire regimes may increase pressures on biodiversity, such as expansion of the fire season (e.g. potential for fires earlier and later than normal), changes to the dominant fire type (e.g. a shift from low severity understorey fires toward higher severity crown fires) and changes to the spatial patterns of fire in the landscape (DAWE, 2021c). For example, the highly spatially restricted nature of Araluen Scarp Grassy Forest places it at risk of being entirely burnt within a single fire event. Mega-fires, such as those experienced in the 2019-2020 fire season, can burn a significant proportion of the ecological community (an estimated 26% of the ecological community was within the extent of the 2019-20 bushfires (DAWE 2020) and the surrounding vegetation in a single event, which compounds these detrimental impacts. Fires also have effects on biotic interactions, such as herbivore-plant interactions (e.g. altering resource availability), predator-prey interactions (e.g. facilitating easier access for feral predators to native fauna) and abiotic interactions, such as combined drought and fire, which may have compounding effects on rates of plant mortality and regenerative capacity (DAWE, 2021c).

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Threat	Threat Status*	Threat impacts
Severe drought and climate change	<p>Timing: ongoing</p> <p>Severity: major</p> <p>Scope: whole</p>	<p>Severe drought can cause mass canopy dieback in eucalypt forests and may decrease the capacity for forests to regenerate following fire (Choat et al., 2018, Nolan et al., 2021b, Blackman et al., 2019). Araluen Scarp Grassy Forest is known to be susceptible to severe drought (NSW Scientific Committee, 2011). Occurrence of drought-related dieback of canopy trees and understorey plants has been identified during field surveys of this community (Tozer et al., 2010).</p> <p>Drought may interact with overgrazing to exacerbate negative effects on this community (NSW Scientific Committee, 2011), e.g. reduced availability of palatable ground layer vegetation during drought is likely to lead to increased browsing of woody shrubs and trees, potentially inhibiting plant recruitment (Pahl, 2019, Tasker and Bradstock, 2006). Drought may also interact with fire regimes, e.g. increases in the likelihood of large and severe wildfires (Andrade et al., 2019, Nolan et al., 2020a).</p> <p>Current and future drought episodes are occurring against the background of rising global temperatures, with predictions that drought and heatwave severity will increase for south-eastern Australia (Kirono et al., 2020). Some models predict that the frequency of severe drought will also increase in this region (Herold et al., 2021). Specifically, the South East and Tablelands Region of NSW is predicted to experience higher severity drought in future, along with a 10–50% increase in the number of severe fire weather days (DECCW, 2010, OEH, 2014). For this region, OEH (2014) also predicts that:</p> <ul style="list-style-type: none"> • Maximum temperatures are predicted increase by 0.5–1°C within the next 20 years and by 1.8–2.5°C within 40–60 years; • Minimum temperatures are predicted to increase by 0.4–0.7°C within the next 20 years and by 1.4–2.3°C within the next 40–60 years; • The number of days >35°C will increase and the number of nights <2°C will decrease; • Rainfall will decrease in spring and winter, while rainfall will increase in summer and autumn.
Clearing for agricultural activities and rural dwellings	<p>Timing: mostly past / some ongoing</p> <p>Severity: extreme</p> <p>Scope: minority</p>	<p>European settlement and subsequent extensive land clearing for agriculture on the NSW south coast and hinterland began as early as the late 1820s (Keith and Bedward, 1999).</p> <p>Land clearing for agricultural activities and hobby farms and fire protection is a known ongoing threat currently facing Araluen Scarp Grassy Forest (NSW Scientific Committee, 2011).</p>

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Threat	Threat Status*	Threat impacts
Over grazing by feral animals and domestic livestock	Timing: ongoing Severity: major Scope: majority	Overgrazing by feral animals including Goat (<i>Capra hircus</i>) and Deer (<i>Cervus</i> spp.) and by domestic livestock, are known threats currently affecting Araluen Scarp Grassy Forest (NSW Scientific Committee, 2011, Tozer et al., 2010). Other species known to occur within reserves that contain Araluen Scarp Grassy Forest include: Rabbit (<i>Oryctolagus cuniculus</i>) and Pig (<i>Sus scrofa</i>). Known issues associated with overgrazing in this community include reduced ground layer diversity, reduced recruitment of woody plants, damage to, and erosion of sensitive upper soil horizons and interactions with drought and weed invasion that may increase negative effects on vegetation and soils (NSW Scientific Committee, 2011). The majority of this community occurs on private land or other tenure where livestock potentially occurs. Overgrazing, and its interaction with erosion and weed invasion is resulting in habitat degradation and reducing the ecological function of Araluen Scarp Grassy Forest (NSW Scientific Committee, 2011).
Invasive plant species	Timing: ongoing Severity: major Scope: majority	Invasive species have the capacity to transform ecosystems and inhibit or alter ecological function (Vilà et al., 2011). Invasion of natural ecosystems by introduced plant species is most likely to occur on edges where land conversion has taken place (Vilà and Ibáñez, 2011). Invasive plant species are a known issues within Araluen Scarp Grassy Forest (NSW Scientific Committee, 2011). Weed invasion, and its interaction with overgrazing and erosion is likely to be resulting in habitat degradation and reducing the ecological function of Araluen Scarp Grassy Forest (NSW Scientific Committee, 2011). Known invasive species within Araluen Scarp Grassy Forest include (but are not limited to): <i>Ailanthus altissima</i> , <i>Bidens pilosa</i> , <i>Centaurium erythraea</i> , <i>Cirsium vulgare</i> , <i>Cytisus scoparius</i> , <i>Hypochaeris radicata</i> , <i>Lepidium africanum</i> , <i>Nassella trichotoma</i> , <i>Opuntia</i> spp., <i>Paronychia brasiliensis</i> , <i>Phytolacca octandra</i> , <i>Plantago lanceolata</i> , <i>Rosa rubiginosa</i> , <i>Rubus ulmifolius</i> , <i>Senecio</i> spp., <i>Sida rhombifolia</i> , <i>Solanum pseudocapsicum</i> , <i>Sonchus asper</i> , <i>Sonchus oleraceus</i> , <i>Stellaria media</i> , <i>Taraxacum officinale</i> , <i>Verbascum virgatum</i> , and <i>Verbena rigida</i> (NSW Scientific Committee, 2011, NSW Government, 2021).
Mineral extraction	Timing: past / future Severity: major Scope: minority	Land clearing, habitat degradation and pollution associated with mineral extraction is a potential threat to Araluen Scarp Grassy Forest. Historically, the majority of land known to support patches of Araluen Scarp Grassy Forest has been leased for mineral mining (primarily gold; NSW Geoscience 2021). Currently there are both active mining leases and leases under application for the majority of this community (NSW Geoscience, 2021). Additionally, there are numerous prospecting sites listed within patches of the ecological community (NSW Geoscience 2021).
Invasive predators	Timing: ongoing Severity: minor Scope: unknown	Invasive predator species known to occur within National Park estate that contains patches of Araluen Scarp Grassy Forest include: Cat (<i>Felis catus</i>), European red fox (<i>Vulpes vulpes</i>), Wild dog (<i>Canis lupis</i> subsp.) (NSW NPWS, 2019). At present these species, along with invasive herbivores, are managed in Berlang SCA, Frogs Hole NR and Majors Creek SCA in accordance with the relevant NPWS plan of management (NSW NPWS, 2019). For example, a mass aerial shooting program took place in December 2021 targeting feral animals (Allen, 2021).

Threat	Threat Status*	Threat impacts
Firewood harvesting	Timing: ongoing Severity: minor Scope: minority	Removal of standing and fallen trees for firewood, fencing and other rural uses is a known threat to Araluen Scarp Grassy Forest (NSW Scientific Committee, 2011). Such activities are likely to interact with the effects of drought, fire and overgrazing by further contributing to disturbance, exacerbating impacts on Araluen Scarp Grassy Forest. For example coarse woody debris influence leaf litter moisture content and soil conditions, moderating the effects of drought on soil moisture (Goldin and Hutchinson, 2014) and on fire behaviour. Further, interactions between selective timber removal and livestock grazing may alter bird assemblages, e.g. increasing the abundance of aggressive birds such as the noisy miner (<i>Manorina melanoccephala</i>) (Eyre et al., 2009). The majority of this ecological community occurs on private land or other tenure where firewood harvesting potentially occurs.
<p>*Timing – the threat occurs in the past (and unlikely to return), is ongoing (present/continuing), is likely to occur/return in the future, or timing is unknown</p> <p>Severity – the threat causes or has the potential to cause impacts that are extreme (leading to loss or transformation of affected patches/occurrences), major (leading to degradation of affected patches/occurrences), minor (impacting some components of affected patches/occurrences), negligible or unknown</p> <p>Scope – the threat is affecting the whole (>90%), a majority (>50%), a minority (<50%), a negligible amount, or unknown amount of the ecological community</p>		

4.1.1 Key threatening processes

The EPBC Act provides for the identification and listing of key threatening processes. A process is defined as a key threatening process if it threatens or may threaten the survival, abundance or evolutionary development of a native species or ecological community.

The following are EPBC-listed key threatening processes, current at the date of writing, that may be relevant to the ecological community or specific plants and animals that comprise it:

- Land clearance
- Novel biota and their impact on biodiversity
- Loss of plant species and erosion caused by overgrazing by feral animals and domestic livestock.
- Competition and land degradation by unmanaged goats
- Predation, Habitat Degradation, Competition and Disease Transmission by Feral Pigs
- Predation by feral cats
- Predation by European red fox
- Competition and land degradation by rabbits

Any approved threat abatement plans or advice associated with these items provides information to help landowners manage these threats and reduce their impacts to biodiversity.

These can be found at <http://www.environment.gov.au/cgi-bin/sprat/public/publicgetkeythreats.pl>.

Consultation Questions on the threats

- Do you agree with the information in the Threats table?
- Are any of the listed threats more, or less, severe or of different timing or scope than currently proposed for this ecological community?
- Are any threats (current or potential) missing, and if so please specify?
- Is logging a threat to this ecological community in areas outside the Araluen Valley?
- Please provide additional examples of threat impacts, including potential threats, and references.

5 Conservation of the ecological community

5.1 Primary conservation objective

To prevent the extinction of the Araluen Scarp Grassy Forest and help recover its biodiversity and function through protecting it from significant impacts as a Matter of National Environmental Significance under national environmental law, and by guiding implementation of management and recovery, consistent with the recommended priority conservation and research actions set out in this advice.

5.2 Existing protection and management plans

5.2.1 Existing protections

Araluen Scarp Grassy Forest in the South East Corner Bioregion is listed as an endangered ecological community in NSW, under the *NSW Biodiversity Conservation Act 2016*.

Patches of the community are known to exist within NPWS reserves, which have varying levels of regulation, active management and public access, including Araluen Nature Reserve, Berlang State Conservation Area, Majors Creek State Conservation Area and Frogs Hole Nature Reserve.

Around 24% of the community currently lies within conservation reserves.

5.2.2 Existing management plans

The following list may not be comprehensive. It is intended to help guide where some other information relevant to the management of the ecological community and broader landscape may be found.

A management strategy associated with the NSW listing of the community has been developed under the Saving Our Species program:

- Saving Our Species (2019). *Help save Araluen Scarp Grassy Forest in the South East Corner Bioregion*. NSW Department of Planning, Industry and Environment. <https://www.environment.nsw.gov.au/savingourspeciesapp/ViewFile.aspx?ReportProjectID=1058&ReportProfileID=20145>
- NSW NPWS 2008. *Araluen Nature Reserve Plan of Management*. In: NPWS (ed.). Narooma, NSW: NSW DECC. <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Parks-reserves-and-protected-areas/Parks-plans-of-management/araluen-nature-reserve-plan-of-management-080658.pdf>
- NSW NPWS 2019. *Deua Catchment Parks Incorporation Berlang State Conservation Area, Frogs Hole Nature Reserve, and Majors Creek State Conservation Area Plan of Management*. In: NPWS (ed.). Sydney, NSW: NSW DPIE. <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Parks-reserves-and-protected-areas/Parks-plans-of-management/deua-catchment-parks-plan-of-management-190541.pdf>

Consultation Questions on existing protections and management plans

- Are there other existing protections you know of that are not covered in the above sections?
- Do you know of any other management plans relevant to the ecological community or the broader landscape that are worth including above?

5.3 Principles and standards for conservation

To undertake priority actions to meet the conservation objective, the overarching principle is that it is preferable to maintain existing areas of the ecological community that are relatively intact and of high quality. There are good, practical reasons to do so. It is typically more cost-effective to retain an intact remnant than to allow degradation and then attempt to restore it or another area. The more disturbed and modified a patch of the ecological community, the greater the recovery effort that is required. Also, intact remnants are likely to retain a fuller suite of native plant and animal species, and ecological functions. Certain species may not be easy to recover in practice, if lost from a site.

This principle is highlighted in the *National Standards for the Practice of Ecological Restoration in Australia* (Standards Reference Group SERA, 2021):

“Ecological restoration is not a substitute for sustainably managing and protecting ecosystems in the first instance.

The promise of restoration cannot be invoked as a justification for destroying or damaging existing ecosystems because functional natural ecosystems are not transportable or easily rebuilt once damaged and the success of ecological restoration cannot be assured.”

Standards Reference Group SERA (2021) – Appendix 2.

The principle discourages ‘offsets’ where intact remnants are removed with an undertaking to set aside and/or restore other, lesser quality, sites. The destruction of intact sites represents a net loss of the functional ecological community because there is no guarantee all the species and ecological functions of the intact site can be replicated elsewhere.

Where restoration is to be undertaken, it should be planned and implemented with reference to the *National Standards for the Practice of Ecological Restoration in Australia*. These Standards guide how ecological restoration actions should be undertaken and are available online from the Standards Reference Group SERA (2021). They outline the principles that convey the main ecological, biological, technical, social and ethical underpinnings of ecological restoration practice.

5.4 Priority conservation and research actions

Priority actions are recommended for the abatement of threats and supporting recovery of the ecological community. They are designed to provide guidance for:

- planning, management and restoration of the ecological community by State agencies, landholders, Traditional custodians, NRM and community groups and other land managers;
- conditions of approval for relevant controlled actions under national environment law (the EPBC Act); and
- prioritising activities in applications for Australian Government funding programs.

Detailed advice on actions may be available in specific plans, such as management plans for weeds, fire or certain parks or regions. The most relevant at the time this conservation advice was developed are listed in [section 5.2](#).

This conservation advice identifies priority conservation actions under the following key approaches:

- PROTECT the ecological community to prevent further losses;
- RESTORE the ecological community by active abatement of threats, appropriate management, restoration and other conservation initiatives;
- COMMUNICATE, ENGAGE WITH AND SUPPORT people to increase understanding of the value and function of the ecological community and encourage their efforts in its protection and recovery; and
- RESEARCH AND MONITORING to improve our understanding of the ecological community and the best methods to aid its management and recovery.

These approaches overlap in practice; and form part of an iterative approach to management that includes research, planning, management, monitoring and review.

The actions below do not necessarily encompass all actions in detail that may benefit the ecological community. They highlight general but key actions required to at least maintain survival of the ecological community at the time of preparing this Conservation Advice.

5.4.1 *PROTECT the ecological community*

This key approach includes priorities intended to protect the ecological community by preventing further losses of occurrences.

- The ecological community should be properly taken into account during the early stages of zoning and development planning decisions, including strategic planning documents at state, regional and local levels, to protect it from clearing and degradation.
- Liaise with local councils and State authorities to ensure that cumulative impacts on the ecological community are reduced as part of broader strategic planning or large projects (e.g. including fire management, road works, developments).
- Undertake activities to mitigate future climate change and therefore reduce the impacts of climate stress on this ecological community.

5.4.1.1 *CONSERVE REMAINING PATCHES*

There should be no further clearance and deliberate damage to patches of this ecological community that meet the minimum condition thresholds because it has an extremely limited extent and had been greatly reduced in its integrity.

- Protect and conserve remaining areas of the ecological community.
- Retain other native vegetation remnants, near patches of the ecological community, where they are important for connectivity, diversity of habitat and act as buffer zones between the ecological community and threats or rural development, forestry or mining zones.
- Protect patches identified as of regional importance in formal conservation reserves. Consider other remnants for less formal conservation tenures, preferably ones that aim for protection over the long-term. This includes investigating formal conservation arrangements, management agreements and covenants to protect patches on private land. This is particularly important for larger patches or areas that link to other patches of native vegetation.
- Where regeneration is occurring, provide measures that will support the regeneration to maturity (e.g. provide fencing to minimise damage risk).
- Protect mature and over-mature trees and stags, particularly with hollows. Large and old trees typically have numerous hollows or fissures that provide shelter and support a diversity of animals.

5.4.1.2 *MANAGE ACTIONS TO MINIMISE IMPACTS*

Apply the mitigation hierarchy to avoid, then mitigate, then offset potential impacts on the ecological community from development or other actions. The priority is to avoid further clearance and fragmentation of remnants with offsetting as the last resort.

- Plan projects to avoid the need to offset, by avoiding significant impacts to the ecological community.
- In circumstances where impacts cannot be totally avoided, then they should be minimised by:
 - retaining and avoiding damage to high quality patches, which should be managed to retain their benchmark state; and
 - protecting important habitat features, such as large mature trees or stags with hollows as these take many decades to develop and cannot be quickly replaced.
- Where impacts are unavoidable, offsets should be used as a last resort to compensate for the adverse impacts of the action deemed unavoidable. The outcomes of offsetting activities are generally highly uncertain. Any proposals considering offsets for this ecological community should aim to:
 - minimise the need to offset the ecological community by designing development around the ecological community and applying buffers;
 - retain medium and higher quality patches of the ecological community, rather than offset them (particularly with lower quality offset sites);
 - manage and protect offset areas in perpetuity in areas dedicated for conservation purposes - avoid risks that reduce may their size, condition and ecological function in the future;
 - select offset sites as close as possible to the impact site, to allow for local and regional variation in the ecological community;
 - increase the area and improve ecological function of existing patches, for example by enhancing landscape connectivity, habitat diversity and condition;
 - extend protection to otherwise unprotected sites (e.g. sites that are currently too small or degraded to meet the minimum condition thresholds, but can reasonably be restored to a better, more intact condition that does meet the thresholds);
 - maintain a register of offsets for the ecological community; and
 - monitor offset areas and the outcomes they deliver over the long-term, to manage them adaptively and improve understanding of the best ways to manage offsets to delivery biodiversity benefits.

Threatened Species Scientific Committee

- Minimise the risk of indirect impacts to the ecological community from actions outside but near to patches of the ecological community, for example avoid building fire-sensitive infrastructure in or immediately adjacent to patches of the community that will encourage fire-hazard reduction activities.
- Prior to removal of any trees or use of heavy machinery that may also damage the understorey, ensure comprehensive flora and fauna surveys have identified threatened or locally important species on site and their potential shelter and nesting sites (for example hollows, burrows, rocks and tree crevices, as well as visible nests). Damage to these should be avoided altogether, but if approved for removal, care should be taken to appropriately relocate or otherwise protect fauna, and avoid undertaking the works during important times, such as during breeding seasons.

5.4.1.3 APPLY BUFFER ZONES

- Protect and apply appropriate buffers, particularly of other native vegetation, around patches of the ecological community to minimise off-site impacts. A buffer zone is a contiguous area adjacent to a patch that is important for protecting the integrity of the ecological community. As the risk of indirect damage to an ecological community is usually greater where actions occur close to a patch, the purpose of the buffer zone is to minimise this risk by guiding land managers to be aware that the ecological community is nearby and take extra care. For instance, the buffer zone will help protect the root zone of edge trees and other components of the ecological community from spray drift (fertiliser, pesticide or herbicide sprayed in adjacent land), weed invasion, polluted water runoff and other damage. The best buffer zones are typically comprised of other native vegetation. Fire breaks and other built asset protection zones do not typically provide a suitable buffer and should be additional to a vegetated buffer.
- The recommended minimum buffer zone is 30 m from the outer edge of the patch as this distance accounts for likely influences upon the root zone. A larger buffer zone (e.g. 100 m) should be applied upslope of any patch and where else practical, to protect patches that are of very high conservation value. Judgement should be exercised to determine an appropriate buffer distance, depending on circumstances and how a patch may be detrimentally impacted.

5.4.1.4 PREVENT THE INTRODUCTION AND SPREAD OF EXOTIC SPECIES

- Support strong border biosecurity and avoid importing or accidentally introducing invasive species and pathogens that may have a serious adverse impact on this ecological community.
- Prevent planting of known or potentially invasive species in gardens, farms, developments and landscaping near the ecological community.

- Prevent dumping of garden, farm or mining waste into bushland, especially in or near patches of the ecological community.
- Cease/prohibit the sale and planting of known invasive species in areas where the ecological community occurs. Review the planting schedule for new developments and landscaping to ensure that potential weeds or other inappropriate plants (e.g. native plants likely to contaminate the local gene pool) are not included.
- Control runoff during nearby construction or mining activities to prevent movement of weeds and pathogens into the ecological community.
- When conducting activities in or around the ecological community, practice good biosecurity hygiene to avoid spreading weeds or pathogens (see DoE, 2015).
- Minimise unnecessary soil disturbance that may facilitate weed establishment.
- If new invasive species incursions do occur, detect and control them early, as small infestations are more likely to be eradicated.
- Limit or prevent access of grazing animals to patches of the ecological community (e.g. construct fences) where practicable. Provide advice and support to landholders to assist with this.
- Limit or prevent access of vehicles to patches of the ecological community.
- Prevent further incursions of feral animals into the ecological community and, where possible, contain pets in nearby residential areas.

5.4.2 *RESTORE and MANAGE the ecological community*

This key approach includes priorities to restore and maintain the remaining occurrences of the ecological community by active abatement of threats, appropriate management, restoration and other conservation initiatives.

- Liaise with landholders and undertake and promote programs that ameliorate threats such as land clearing, grazing, inappropriate fire regimes, land, weed invasion or human disturbance.
- Identify and prioritise other specific threats and undertake appropriate on-ground site management strategies where required.

5.4.2.1 *MANAGE WEEDS, PESTS AND DISEASES*

Implement effective integrated control and management techniques for weeds, pests and diseases affecting the ecological community and manage sites to prevent the introduction of new, or further spread of, invasive species.

- Identify potential new weed incursions early and manage for local eradication, where possible.
- Prioritise weeds and patches for which management is most urgent.
- Target control of key weeds that threaten the ecological community using appropriate methods that avoid impacts to non-target species.
- Encourage appropriate use of local native plant species in developments in the region through local government and industry initiatives and best practice strategies.
- Ensure chemicals, or other mechanisms used to manage weeds, do not have significant adverse, off-target impacts on the ecological community or adjacent native vegetation or waterbodies.
- Control introduced pest animals through coordinated landscape-scale control programs, with a particular focus on goats.

5.4.2.2 MANAGE TRAMPLING, BROWSING AND GRAZING

- Any grazing which may be occurring in the ecological community should cease and fencing may be required for exclusion of stock.
- Low-level grazing, firewood cutting and other uses which may be acceptable in dry forests are not appropriate in this ecological community.
- Manage surface water runoff, seepage and associated nutrient and water enrichment from upslope pastures

5.4.2.3 MANAGE ACTIVITIES AND ACCESS

- Cease/prohibit and monitor wood collection, such as for firewood or fencing, that leads to the loss and damage of trees, stags, logs or disturbs the natural litter layer.
- Cease/prohibit and monitor destructive activities such as off-road trail bike, quad bike or four-wheel driving.
- Cease/prohibit and monitor wildflower, invertebrate and other fauna collection.
- Cease/prohibit and monitor rubbish dumping.
- Cease/prohibit access by domestic pets, by containing them in nearby residential areas or keeping them on leashes.

5.4.2.4 MANAGE APPROPRIATE FIRE REGIMES

- Implement appropriate fire management regimes for the ecological community and for the landscapes surrounding the ecological community. Take into account Indigenous knowledge and scientific research results.

- Where hazard reduction burns or prescribed fires are undertaken in areas near to the ecological community, ensure that the potential for the fire to escape is appropriately risk assessed and management responses are in place to protect the ecological community.
- Use a landscape-scale approach and available local knowledge on fire histories to identify sites that would benefit from reinstating appropriate fire frequency to prevent further declines of patches affected by either too low, or too high, fire frequency.
 - For areas of the ecological community affected by too high fire frequency, identify options for reducing the frequency of fires and protecting important features, such as habitat trees.
 - Fire management strategies at each location should take into account patch size, habitat features (e.g. protect hollow-bearing trees and large logs), vegetation structure and the surrounding landscape (including property protection) to minimise damage, maintain refuges for fauna (during and after fire) and increase habitat variability
- Fires (including planned burns nearby) must be managed to: maintain the integrity of the ecological community and avoid disruption of the life cycles of the component species; support rather than degrade the habitat; avoid invasion of exotic species; and avoid increased detrimental impacts of other threats such as drought, grazing or predation by feral predators. Isolated faunal populations, the rainforest understorey, and threatened plants are particularly vulnerable to local extinction following intense fires combined with other threats.
 - Ensure that an invasive species risk assessment and management program is planned and budgeted for ahead of proposed burning.
 - Use available ecological information to avoid detrimental fire impacts on key and susceptible species in the ecological community. For instance, do not undertake planned burns in areas adjacent to the ecological community when key, threatened or functionally important flora and fauna (that may be adversely impacted) are flowering, nesting or otherwise reproducing.
 - Consider weather conditions. Do not burn adjacent to the ecological community when soil moisture is low, or dry conditions are predicted for the coming season because flora and fauna will already be stressed, recovery will be too slow and erosion may occur; or, weeds may become established while vegetation cover is reduced.
 - Monitor the outcomes of fire and the consequences of other threats. Manage these within an appropriate timescale (e.g. immediately: put in place erosion control measures; limit access by feral predators and grazers; control weeds as they first appear with follow up treatments as necessary, until native vegetation has regenerated); consider shelter and food needs of native fauna. Ensure

monitoring results are taken into account when planning and implementing future fire regimes.

5.4.2.5 UNDERTAKE RESTORATION

Undertake restoration, including bush regeneration and revegetation, of poorer and medium quality patches to restore them to high quality, including restoration of patches that don't currently meet the minimum condition thresholds for protection to a condition that does (see Table 1).

- Restoration to improve the condition of degraded patches should aspire to the 5 Star Standard of the SERA Standards. Land managers should aim for the highest and best recovery of the ecological community to maximise biodiversity and ecological function based on appropriate metrics for each site (see Condition Thresholds at Table 1 and SERA (2021) for guidance on implementing appropriate standards). This is particularly the case for sites that are being restored or reconstructed from highly altered states.
- Work with landholders to restore and reconnect patches of the ecological community and other adjacent or nearby native vegetation (including buffer areas)
- Maintain stags, logs, and mature and old-growth trees with hollows as they provide important habitat for fauna.
- If necessary, supplement, (but do not replace) habitat as part of restoration projects by placing hollow logs, large rocks or other habitat features (such as artificial hollows or various sized nest boxes) in or near to, the ecological community. This may be particularly important after disturbance such as a severe fire event.
- Use local native species in restoration/revegetation projects for the ecological community and restore understorey vegetation to a structure and diversity appropriate to the site.
- In general, use locally collected seeds, where available, to revegetate native plant species. However, choosing sources of seed closer to the margins of their range may increase resilience to climate change. Take into account key plant species' growing seasons to successfully achieve seed set.
- Ensure commitment to follow up after planting, such as the care of newly planted vegetation by watering, mulching, weeding and use/removal of tree guards.
- Consider the landscape context and other relevant species and communities when planning restoration works. For example, ensure adjacent ecological communities and threatened and migratory species are not adversely impacted by tree planting or other restoration activities for the ecological community.

- Close and rehabilitate unnecessary roads and tracks and otherwise control access to restored patches.

5.4.3 *COMMUNICATE, engage with and support*

This key approach includes priorities to promote the ecological community to build awareness and encourage people and groups to contribute to its recovery. This includes communicating, engaging with and supporting the public and key stakeholders to increase their understanding of the value and function of the ecological community and to encourage and assist their efforts in its protection and recovery. Key groups to communicate with include landholders, land managers, land use planners, researchers, community members and Indigenous communities.

5.4.3.1 *RAISE AWARENESS*

- Communicate with landholders/managers, relevant agencies and the public to emphasise the value of the ecological community, the key threats, its significance, and appropriate management. Encourage landholders to talk with local NRM organisations and other knowledgeable groups.
- Undertake effective community engagement and education to highlight the importance of minimising disturbance (e.g. during recreational activities) and of minimising pollution and littering (e.g. via signage).
- Inform landholders about incentives, such as conservation agreements, stewardship projects, funding and government NRM programs etc. that may apply to help look after sites on private lands.

5.4.3.2 *PROVIDE INFORMATION*

- Develop education programs, information products and signage to help the public recognise the presence and importance of the ecological community, and their responsibilities under state and local regulations and the EPBC Act.
- Install signage to discourage damaging activities such as the removal of dead timber, dumping garden waste and other rubbish, creating informal paths and tracks, and the use of off-road vehicles or mineral prospecting in patches of the ecological community.
- Install significant vegetation markers along roads to designate areas of the ecological community to protect and prevent inappropriate road side maintenance from occurring.
- Promote knowledge about local weeds and what garden/agricultural plants to avoid planting. Recommend local native species for revegetation and landscaping or safe alternative garden/agricultural plants.

5.4.3.3 COORDINATE EFFORTS

- Encourage local participation in restoration and ‘landcare’ efforts through local conservation groups, creating ‘friends of’ groups, field days and planting projects, etc.
- Liaise with local fire management authorities and agencies and engage their support in fire management of the ecological community. Ensure land managers are given information about how to manage fire risks to conserve this and other threatened ecological communities and species.
- Develop coordinated incentive projects to encourage conservation and stewardship of the ecological community on private land, and link with other programs and activities, especially those managed by regional Natural Resource Management groups.
- Support opportunities for traditional owners/custodians or other members of the Indigenous community to manage the ecological community.
- Promote awareness and protection of the ecological community with relevant agencies and industries. For example with:
 - state and local government planning authorities, to ensure that planning takes the protection of remnants into account; infrastructure or development works involving substrate or vegetation disturbance do not adversely impact the ecological community; maintenance activities (e.g. roads and roadsides) avoid the introduction or spread of weeds; with due regard to principles for long-term conservation;
 - land owners and developers, to minimise threats associated with land conversion and development;
 - Natural Resource Management organisations, conservation organisations and groups volunteering time for restoration and ecological management.

5.4.4 RESEARCH and monitoring

This key approach includes priorities for research into the ecological community, and monitoring, to improve understanding of the ecological community and the best methods to aid its recovery through restoration and protection. Relevant and well-targeted research and other information gathering activities are important in informing the protection and management of the ecological community.

5.4.4.1 MAPPING

- Collate existing vegetation mapping information and associated data for this ecological community and identify gaps in knowledge.

- Comprehensively map and ground-truth the extent and condition of the ecological community at fine-scale resolution across its range:
 - support field survey and interpretation of other data such as aerial photographs and satellite images to more accurately document current extent, condition, threats, function, presence and use by regionally significant or threatened species.
 - support and enhance existing programs to model the pre-1750 extent across the entire range of the ecological community to inform restoration;
 - identify the most intact, high conservation value remnants and gain a better understanding of variation across the ecological community;
 - identify and map the fire interval status of the ecological community and surrounding fire-dependent and/or fire sensitive vegetation;
 - collate existing information on populations of fauna characteristic of the ecological community across its range.

5.4.4.2 *OPTIONS FOR MANAGEMENT*

- Investigate key ecological interactions, such as the role of fauna in pollination, seed dispersal and nutrient cycling.
- Research into appropriate and integrated methods to manage pests and weeds that affect the ecological community.
- Assess the vulnerability of the ecological community to climate change and investigate ways to improve resilience through other threat abatement and management actions.
- Assess the impact that nearby or proposed mining activities may have on surface water flows/quality and ground water flows/quality within patches of the ecological community.
- Improve understanding of how fire regimes affect life history processes and population dynamics of component flora and fauna, including indirect effects through interactions with threats posed by periodic droughts, invasive species and other threats.
- Use improved knowledge of fire ecology to investigate the efficacy of alternative fire management strategies for conservation of the community on different land tenures and land uses.
- Conduct research leading to the development of effective landscape-scale restoration techniques for the ecological community. Investigate the interaction between

disturbance types, such as fire and invasion by weeds and feral animals, to determine how an integrated approach to threat management can be implemented.

- Investigate the most cost-effective options for restoring landscape function, including re-vegetation or assisted regeneration of priority areas, potentially buffering, connecting and protecting existing remnants.

5.4.4.3 MONITORING

- It is important that any monitoring is planned before management commences and considers what data are required to address research questions. Monitoring must also be resourced for management activities, especially for those using a novel approach, and applied during and following the management action.
 - Monitor for signs of decline, in terms of known problems e.g. drought-related dieback, loss of vegetation structure, loss of rainforest elements, weed incursion, and new incursions, e.g. *Phytophthora* dieback, myrtle rust.
 - Monitor changes in the condition, composition, structure and function of the ecological community, including response to all types of management actions and use this information to increase understanding of the ecological community and inform recommendations for future management.

Consultation Questions on the priority actions

- Is this list of proposed priority actions to conserve this ecological community complete and appropriate?
- Is there any evidence to inform fire management that would maintain the ecological community? Do you have an opinion about appropriate fire-regimes that would maintain both the understorey and canopy layer?
- The Committee and Department would appreciate any additional information or advice to improve this section, including an indication of what are the highest priorities and why.

6 Listing assessment

The Threatened Species Scientific Committee has provided this draft assessment for consultation.

6.1 Reason for assessment

This assessment follows prioritisation of a nomination from the Threatened Species Scientific Committee in response to the impacts of the 2019-2020 bushfires.

6.2 Eligibility for listing

This assessment uses the criteria set out in the [EPBC Regulations](#) and TSSC [Guidelines for Nominating and Assessing Threatened Ecological Communities](#), as in force at the time of the assessment.

6.2.1 Criterion 1 – decline in geographic distribution

Not eligible under Criterion 1.

	Category		
	Critically Endangered	Endangered	Vulnerable
Its decline in geographic distribution is:	very severe	severe	substantial
<i>decline relative to the longer-term/1750 timeframe</i>	≥90%	≥70%	≥50%
<i>decline relative to the past 50 years</i>	≥80%	≥50%	≥30%

Source: TSSC 2017

Evidence:

Based on analysis of the extant versus pre-1750 NSW State Vegetation Type Mapping (SVTM) (DPIE, 2021b, DPIE, 2020), the geographic distribution of the Araluen Scarp Grassy Forest is estimated to have declined by 17% since pre-1750. The NSW Scientific Committee (2011) estimated that the ecological community has declined by less than 25% since pre-1750. This falls below the threshold for vulnerable.

Following assessment of the data the Committee has determined that the ecological community is not eligible for listing in any category under Criterion 1.

6.2.2 Criterion 2 – limited geographic distribution coupled with demonstrable threat

Eligible under Criterion 2 for listing as **Endangered**.

Its geographic distribution is:		very restricted	restricted	limited
<i>Extent of occurrence (EOO)</i>		< 100 km ² = <10,000 ha	<1,000 km ² = <100,000 ha	<10,000 km ² = <1,000,000 ha
<i>Area of occupancy (AOO)</i>		< 10 km ² = <1,000 ha	<100 km ² = <10,000 ha	<1,000 km ² = <100,000 ha
<i>Average patch size</i>		< 0.1 km ² = <10 ha	< 1 km ² = <100 ha	-
AND the nature of its distribution makes it likely that the action of a threatening process could cause it to be lost in:				
the immediate future	10 years or 3 generations (up to a maximum of 60 years)	Critically endangered	Endangered	Vulnerable
the near future	20 years or 5 generations (up to a maximum of 100 years)	Endangered	Endangered	Vulnerable
the medium term future	50 years or 10 generations (up to a maximum of 100 years)	Vulnerable	Vulnerable	Vulnerable

Source: TSSC 2017

Evidence:

The geographic distribution for this ecological community has been calculated from the NSW SVTM: NSW Plant Community Type (DPIE, 2021b).

The estimated Extent of Occupancy (EoO) for the ecological community is 225,225 ha or 2252 km². This represents a **limited** geographic distribution. The estimated Area of Occupancy (AoO) for the ecological community is 6274 ha or 63 km². This represents a **restricted** geographic distribution. The median patch size is 1.66 ha or 0.0166 km². This represents a **very restricted** geographic distribution. Around 58% of the ecological community exists as patches smaller than 10 ha in size.

The ecological community's highly patchy distribution makes management initiatives and actions difficult to coordinate across its range and increases the ecological community's susceptibility to immediate threats such as clearing or degradation through inappropriate management. Only around 24% of the community currently lies within land reserved for nature conservation.

The small patch size of the community and conversion of much of the surrounding landscape for agriculture also makes it vulnerable to edge effects such as weed ingress, changes to microclimate, changes to species richness and abundance and changes to vegetation structure (Laurance et al., 2002). The community shares a common boundary with cleared land along 22% of its edge. Small patches are also susceptible to cumulative losses to small-scale clearing and 'tidying'. Analysis of recent woody vegetation change data (DEE, 2017) suggests that up to 6% of the community may have been recently cleared for either agriculture or rural development. Further loss of patches may reduce connectivity and therefore the

ability of some species to disperse between patches (Opdam and Wascher, 2004, Fischer and Lindenmayer, 2007).

Severe drought has the potential to cause mass tree mortality and destabilise temperate forest ecosystems (see Criterion 4 – reduction in community integrity). Severe drought is also a known driver of large and severe wildfires (Andrade et al., 2019, Nolan et al., 2020a). Severe drought episodes are likely to interact with fire regimes that cause biodiversity decline in a number of ways detrimental to fauna and flora (see Threats). Intensified fire regimes, such as those being experienced within south-eastern Australia (Boer et al., 2020, Collins et al., 2021a), will likely compound the risks that many small patches face, making them less likely to persist in the landscape. The ability of the species that represent the community to persist and disperse between patches will likely become more difficult if conditions become less suitable for them in future (Opdam and Wascher, 2004, Fischer and Lindenmayer, 2007).

Large-scale wildfires occurring at short intervals have the capacity to fundamentally change the ecology of Araluen Scarp Grassy Forest, e.g. via extirpation of fire-sensitive mesic elements, to the point where patches of the community may no longer meet the description in 1.2 or the key diagnostics in 2.1. Catastrophic losses of vertebrate and invertebrate populations now occur during some fire seasons in south eastern NSW, with potentially long-lived or permanent changes ecosystems as a result (Marsh et al., 2021, Wintle et al., 2020). Dramatic shifts in fire regimes that may be conducive to such scenarios are recognised to be occurring globally and are linked to anthropogenic climate change (Kirchmeier-Young et al., 2019, Bowman et al., 2020).

Considering the period from 1988 to 2021, the maximum size of areas affected by contiguous high severity fire in this region can be up to approximately 149,000 ha, averaging around 38,000 ha, while the median size of fires overall is approximately 7400 ha (Collins et al., 2021a). Thus, the median fire size within this region exceeds the Area of Occupancy for Araluen Scarp Grassy Forest (6274 ha), and vastly exceed the average patch size for the community (1.66 ha). Further, predicted increases in drought severity and frequency across southeastern Australia (Kirono et al., 2020, Herold et al., 2021) are likely to lead to increased occurrence of large and severe wildfires in this region (Andrade et al., 2019, Nolan et al., 2020a). A 10–50% increase in the number of severe fire weather days is predicted for the South East and Tablelands region specifically within the next 60 years (DECCW, 2010, OEH, 2014).

The interacting effects of severe drought associated with climate change and overgrazing by livestock and feral herbivores (see Threats and Criterion 4 – reduction in community integrity) are likely to be exacerbated by intensified fire regimes. Together, these threatening processes have the potential to cause the loss of the ecological community within 100 years (5 generations of the dominant canopy species).

This represents a **very restricted** geographic distribution, and the nature of this distribution makes it likely that the action of a threatening process could cause it to be lost in the **near future**. Following preliminary assessment, the Committee therefore considers that the

ecological community is likely to meet the relevant elements of Criterion 2 to make it eligible for listing as **Endangered**.

6.2.3 Criterion 3 – decline of functionally important species

There are insufficient data to determine eligibility under Criterion 3.

	Category		
	Critically Endangered	Endangered	Vulnerable
For a population of a native species that is likely to play a major role in the community, there is a:	very severe decline	severe decline	substantial decline
<i>Estimated decline over the last 10 years or three generations, whichever is longer</i>	80%	50%	20%
to the extent that restoration of the community is not likely to be possible in:	the immediate future	the near future	the medium-term future
<i>timeframe</i>	10 years or 3 generations (up to a maximum of 60 years)	20 years or 5 generations (up to a maximum of 100 years)	50 years or 10 generations (up to a maximum of 100 years)

Source: TSSC 2017

Evidence:

The ecological relationships between member species of this community are important for maintaining its ecological function, but specific data related to the decline of individual key species or their functional importance within this ecological community are not available.

The Committee considers that there is insufficient information to determine the eligibility of the ecological community for listing in any category under Criterion 3.

6.2.4 Criterion 4 – reduction in community integrity

Eligible under Criterion 4 for listing as **Endangered**.

	Category		
	Critically Endangered	Endangered	Vulnerable
The reduction in its integrity across most of its geographic distribution is:	very severe	severe	substantial
as indicated by degradation of the community or its habitat, or disruption of important community processes, that is:	very severe	severe	substantial
<i>such that restoration is unlikely (even with positive human intervention) within</i>	<i>the <u>immediate</u> future (10 years or 3 generations up to a maximum of 60 years)</i>	<i>the <u>near future</u> (20 years or 5 generations up to a maximum of 100 years)</i>	<i>the <u>medium-term</u> future (50 years or 10 generations up to a maximum of 100 years)</i>

Source: TSSC 2017

Evidence:

Complex and detrimental interactions involving past land clearing, overgrazing, drought, fire impacts, weed invasion, mining impacts and timber extraction may occur within Araluen Scarp Grassy Forest, causing severe reductions in integrity and degradation of ecological

functions across most of its range. The ecological community has undergone severe changes in structure and function as a result of the threats outlined in [Section 4](#). The ecological community has experienced a reduction in integrity across most of its extent primarily because of:

- Domestic and feral animals;
- Drought-related dieback;
- Mining activity; and
- Timber harvesting.

Domestic and feral animals

Currently up to 68% of the remaining ecological community may be subject to grazing by domestic livestock, e.g. rough-country cattle grazing. Domestic livestock and feral deer are known to preferentially browse grasses, followed by forbs, and will also browse woody shrubs and trees when resources become scarce, such as during drought (Pahl, 2019, Davis et al., 2008, DAWE, 2021a). Feral goats may browse more widely and consume vegetation that is usually avoided by domestic livestock (DAWE, 2021b). As a consequence, overgrazing in this community is likely to result in simplification of understorey vegetation (e.g. reduced plant species abundance and diversity), long term impacts on recruitment of canopy species, removal of shrubs, changes to species dominance, changes in nutrient concentrations, damage to soils and increased erosion (Tasker and Bradstock, 2006, Yates et al., 2000). Presence of introduced herbivores can also negatively impact fauna, e.g. via trampling effects and changes to critical habitat (Hansen et al., 2019, Denmead et al., 2015). Interactions between severe fires and heavy rainfall, i.e., post-fire erosion of bare soils (Tulau et al., 2018), may further exacerbate degradation by overgrazing. Such changes may reduce the effectiveness of future restoration projects (Sims et al., 2019). Livestock are also efficient vectors of transmission for introduced plants species and noxious weeds throughout landscapes, and facilitate the transport of weeds beyond edges and into forest interiors (Castillo-Flores and Calvo-Irabién, 2003, Hogan and Phillips, 2011).

In the NSW south coast and tablelands region, the distribution of feral deer was either patchy or absent in 2009, but had become almost continuous by 2020 (DPI, 2021a). Feral goat distribution has been largely stable and patchy in this region between 2009 to 2016, with localised high density populations, including one centred in the Araluen Valley area (DPI, 2021b). Feral pig distribution has been mostly stable in this region between 2009 to 2016, being present at low to medium densities across the majority of areas containing Araluen Scarp Grassy Forest (DPI, 2021c). Foxes are present in all areas containing Araluen Scarp Grassy Forest (DPI, 2021d). Rabbit distribution has remained largely stable in this region between 2009 to 2016, with continuous low to medium density coverage, except for several notable patches to the north, south and partly within the ecological community, where rabbits are absent or data is deficient (DPI, 2021e).

Drought-related dieback

Drought-related dieback of understorey plants and canopy trees is known to occur within Araluen Scarp Grassy Forest (Tozer et al., 2010, NSW Scientific Committee, 2011). Severe drought has the potential to destabilise ecosystems via changes to canopy conditions and understorey conditions due to insufficient moisture and modified thermal regimes (Allen et al., 2015). There is a wealth of global evidence that indicates severe drought and associated heatwaves can cause mass tree mortality or canopy defoliation in many different types of forested ecosystems (Allen et al., 2010, Brando et al., 2014, Matusick et al., 2013). This phenomenon also occurs in other Australian eucalypt forests that are similar to Araluen Scarp Grassy Forest (Matusick et al., 2013). Further, stands of trees that grow on steep slopes such as Araluen Scarp Grassy Forest may be relatively more susceptible to drought effects than trees that grow in flatter areas, due to higher soil moisture recession (Hawthorne and Miniati, 2017).

Mining activity

Approximately 18.5% of Araluen Scarp Grassy Forest is covered within active mining leases (minerals), while approximately 63% is covered with mining leases under application (NSW Geoscience, 2021). Active leases and leases under application extend across formal reserves in the Araluen area. Almost the entirety of the region has been under mining leases in the past (NSW Geoscience, 2021). More generally, the Araluen Valley was the site of major resource extraction (gold) from in the mid- to late 1800s, when the population of the region grew to several thousand and many structures were built (Wilson, 2008). Anecdotal evidence suggests that gold prospecting and mining was largely confined to waterways and lowlands (McGowan, 1992), although it is likely that disturbances associated with the large human population and mining activity (e.g. unplanned fires, land clearing, timber extraction, changes to hydrology, soil erosion, hunting) have previously impacted vegetation communities and fauna population within the Araluen Valley and Braidwood region more broadly. There have been at least two documented incidents where mining has contaminated waterways that flow into major patches of the community (NSW EPA, 2020, NSW NPWS, 2019). Metal extraction activities typically result in land clearing for mine and road construction, habitat degradation, soil erosion, contamination of land and waterways with heavy metals such as mercury and changes to subsurface water flows (Markham and Sangermano, 2018, González-González et al., 2021, Asner and Tupayachi, 2016). Mining activities are likely to have both direct and indirect negative consequences for biodiversity at multiple spatial scales (Alvarez-Berrios et al., 2016, Murguia et al., 2016).

Timber harvesting

Timber harvesting for firewood or other rural uses is a known issue in Araluen Scarp Grassy Forest (NSW Scientific Committee, 2011). Dead trees and fallen timber provide important habitat for a wide variety of vertebrates and invertebrates and are routinely removed from areas of the ecological community (Walter and Maguire, 2005, Castro and Wise, 2010). The

amount of coarse woody debris available within forest influences leaf litter dynamics, soil conditions and the diversity and abundance of fauna; some species may be absent if adequate coarse woody debris is not available (Mac Nally et al., 2001, Kappes et al., 2009, Kappes et al., 2006). Continued harvesting of firewood or timber for other rural uses from Araluen Scarp Grassy Forest, which is experiencing multiple other pressures is likely to compound interacting negative impacts and further degrade remaining habitat.

Conclusion

The combination of these threat impacts has impacted the structure, species assemblage and ecological function across the range of the ecological community.

This represents a **severe** reduction in integrity across most of its geographic distribution, as indicated by a **severe** degradation of the community of its habitat. Following preliminary assessment, the Committee therefore considers that the ecological community is likely to meet the relevant elements of Criterion 4 to make it eligible for listing as Endangered.

6.2.5 Criterion 5 – rate of continuing detrimental change

There are insufficient data to determine eligibility under Criterion 5.

	Category		
	Critically Endangered	Endangered	Vulnerable
Its rate of continuing detrimental change is: as indicated by:	very severe	severe	substantial
(a) rate of continuing decline in its geographic distribution, or a population of a native species that is believed to play a major role in the community, that is: OR	very severe	severe	serious
(b) intensification, across most of its geographic distribution, in degradation, or disruption of important community processes, that is:	very severe	severe	serious
<i>an observed, estimated, inferred or suspected detrimental change over the immediate past, or projected for the immediate future (10 years or 3 generations, up to a maximum of 60 years), of at least:</i>	80%	50%	30%

Source: TSSC 2017

Evidence:

Although continuing detrimental change is occurring within this ecological community, data on the rate of this change is not available to support specific analysis against Criterion 5 and its indicative thresholds.

The Committee considers that there is insufficient information to determine the eligibility of the ecological community for listing in any category under Criterion 5.

6.2.6 Criterion 6 – quantitative analysis showing probability of extinction

There are insufficient data to determine eligibility under Criterion 6.

	Category		
	Critically Endangered	Endangered	Vulnerable
A quantitative analysis shows that its probability of extinction, or extreme degradation over all of its geographic distribution, is:	at least 50% in the immediate future	at least 20% in the near future	at least 10% in the medium-term future
<i>timeframes</i>	<i>10 years or 3 generations (up to a maximum of 60 years)</i>	<i>20 years or 5 generations (up to a maximum of 100 years)</i>	<i>50 years or 10 generations (up to a maximum of 100 years)</i>

Source: TSSC 2017

Evidence:

Quantitative analysis of the probability of extinction or extreme degradation over all its geographic distribution has not been undertaken. Therefore, there is insufficient information to determine the eligibility of the ecological community for listing in any category under this criterion.

Consultation Questions on the listing assessment

- Do you agree with the draft conclusions against the listing criteria? If not, why not?
- How could the analysis against each of the criteria be improved?
- Please provide any additional data or evidence to support the assessment against the criteria?

Appendix A - Species lists

This Appendix lists the assemblage of native species that characterises the ecological community throughout its range at the time of listing, particularly characteristic and frequently occurring vascular plants at [Table 3](#) and macroscopic animals at [Table 4](#). The ecological community also includes fungi, cryptogamic plants and other species; however, these are relatively poorly documented.

The species listed may be abundant, rare, or not necessarily be present in any given patch of the ecological community, and other native species not listed here may be present. The total list of species that may be found in the ecological community is considerably larger than the species listed here.

Species presence and relative abundance varies naturally across the range of the ecological community based on factors such as historical biogeography, soil properties (e.g. moisture, chemical composition, texture, depth and drainage), topography, hydrology and climate. They also change over time, for example, in response to disturbance (by logging, fire, or grazing), or to the climate and weather (e.g. seasons, floods, drought and extreme heat or cold). The species recorded at a particular site can also be affected by sampling scale, season, effort and expertise. In general, the number of species recorded is likely to increase with the size of the site.

Scientific names used in this Appendix are nationally accepted names as per the Atlas of Living Australia, as at the time of writing.

A1 Flora

Table 3: Flora that are known to occur within the ecological community.

Scientific name	Common name/s	Fire response ¹	EPBC status ²	State status ³	Source
Canopy tree species					
<i>Angophora floribunda</i>	Rough-barked Apple	R	Not listed	Not listed	NSW Scientific Committee (2011)
<i>Eucalyptus angophoroides</i>	Apple-topped Box	R	Not listed	Not listed	Tozer et al. (2010)
<i>Eucalyptus elata</i>	River Gum	R	Not listed	Not listed	Tozer et al. (2010)
<i>Eucalyptus eugenioides</i>	Thin-leaved Stringybark	R	Not listed	Not listed	Tozer et al. (2010)
<i>Eucalyptus globoidea</i>	White Stringybark	R	Not listed	Not listed	Tozer et al. (2010)
<i>*Eucalyptus kartzoffiana</i>	Araluen Gum	R	Vulnerable	Vulnerable	Tozer et al. (2010)
<i>Eucalyptus maidenii</i>	Maiden's Blue Gum	R	Not listed	Not listed	NSW Scientific Committee (2011)
<i>Eucalyptus melliodora</i>	Yellow Box	R	Not listed	Not listed	NSW Scientific Committee (2011)
<i>Eucalyptus muelleriana</i>	Yellow Stringybark	R	Not listed	Not listed	Tozer et al. (2010)
<i>Eucalyptus pilularis</i>	Blackbutt	R; St only	Not listed	Not listed	Tozer et al. (2010)
<i>Eucalyptus polyanthemus</i> <i>subsp. tarda</i>	Red Box	R	Not listed	Not listed	Tozer et al. (2010)

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Scientific name	Common name/s	Fire response ¹	EPBC status ²	State status ³	Source
<i>Eucalyptus tereticornis</i>	Forest Red Gum	R	Not listed	Not listed	NSW Scientific Committee (2011)
Understorey trees and shrubs					
<i>Acacia mearnsii</i>	Black Wattle	R; seedlings > 1 year	Not listed	Not listed	NSW Scientific Committee (2011)
<i>Ficus rubiginosa</i>	Port Jackson Fig	R	Not listed	Not listed	NSW Scientific Committee (2011)
<i>Meliccytus dentatus</i>	Tree Violet	R; B only	Not listed	Not listed	NSW Scientific Committee (2011)
<i>Pittosporum undulatum</i>	Sweet Pittosporum	R	Not listed	Not listed	NSW Scientific Committee (2011)
*† <i>Pomaderris cotoneaster</i>	Cotoneaster Pomaderris	OS	Endangered	Endangered	DAWE (2021d)
*† <i>Pomaderris parrisiae</i>	Parris' Pomaderris	U	Vulnerable	Vulnerable	DAWE (2021d)
*† <i>Zieria adenophora</i>	Araluen Zieria	U	Endangered	Critically Endangered	DAWE (2021d)
Herb and orchid and sedge/graminoid species					
<i>Arthropodium minus</i>	Small Vanilla Lily		Not listed	Not listed	NSW Scientific Committee (2011)
<i>Carex breviculmis</i>	Short-stem Sedge		Not listed	Not listed	NSW Scientific Committee (2011)
<i>Crassula sieberiana</i>	Australian Stonecrop		Not listed	Not listed	NSW Scientific Committee (2011)
<i>Daucus glochidiatus</i>	Australian Carrot		Not listed	Not listed	NSW Scientific Committee (2011)
<i>Desmodium varians</i>	Slender Tick-trefoil		Not listed	Not listed	NSW Scientific Committee (2011)
<i>Dichondra</i> spp.	NA		Not listed	Not listed	NSW Scientific Committee (2011)
<i>Einadia hastata</i>	Berry Saltbush		Not listed	Not listed	NSW Scientific Committee (2011)
<i>Euchiton gymnocephalus</i>	NA		Not listed	Not listed	NSW Scientific Committee (2011)
<i>Hydrocotyle laxiflora</i>	Stinking Pennywort		Not listed	Not listed	NSW Scientific Committee (2011)
<i>Lagenifera stipitata</i>	Blue Bottle-daisy		Not listed	Not listed	NSW Scientific Committee (2011)
<i>Oxalis perennans</i>	Grassland Wood-sorrel		Not listed	Not listed	NSW Scientific Committee (2011)
<i>Plantago debilis</i>	Shade Plantain		Not listed	Not listed	NSW Scientific Committee (2011)
<i>Plectranthus parviflorus</i>	Cockspur Flower		Not listed	Not listed	NSW Scientific Committee (2011)
<i>Rumex brownii</i>	Swamp Dock		Not listed	Not listed	NSW Scientific Committee (2011)
<i>Sigesbeackia orientalis</i> subsp. <i>orientalis</i>	NA		Not listed	Not listed	NSW Scientific Committee (2011)
<i>Solanum pungetium</i>	Eastern Nightshade		Not listed	Not listed	NSW Scientific Committee (2011)
<i>Stellaria pungens</i>	Prickly Starwort		Not listed	Not listed	NSW Scientific Committee (2011)
<i>Veronica plebeia</i>	Trailing Speedwell		Not listed	Not listed	Tozer et al. (2010)
<i>Xerochrysum bracteatum</i>	Golden Everlasting		Not listed	Not listed	Tozer et al. (2010)
Ferns					

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Scientific name	Common name/s	Fire response ¹	EPBC status ²	State status ³	Source
<i>Asplenium flabellifolium</i>	Necklace Fern		Not listed	Not listed	NSW Scientific Committee (2011)
<i>Cheilanthes sieberi</i>	Poison Rock Fern		Not listed	Not listed	NSW Scientific Committee (2011)
<i>Pellaea falcata</i>	Sickle Fern		Not listed	Not listed	NSW Scientific Committee (2011)
Scramblers, climbers, epiphytes					
<i>Clematis aristata</i>	Old Man's Beard	R	Not listed	Not listed	NSW Scientific Committee (2011)
<i>Clematis glycinoides</i> var. <i>glycinoides</i>	Headache Vine	R; B only	Not listed	Not listed	NSW Scientific Committee (2011)
<i>Geitonoplesium cymosum</i>	Scrambling Lily	R; B only	Not listed	Not listed	NSW Scientific Committee (2011)
<i>Glycine clandestina</i>	Twining Glycine	R	Not listed	Not listed	NSW Scientific Committee (2011)
<i>Marsdenia rostrata</i>	Milk Vine	R	Not listed	Not listed	NSW Scientific Committee (2011)
<i>Pandorea pandorana</i>	Wonga Wonga Vine	R	Not listed	Not listed	NSW Scientific Committee (2011)
<i>Tylophora barbata</i>	Bearded Tylophora	R	Not listed	Not listed	NSW Scientific Committee (2011)
Grasses					
<i>Cenchrus caliculatus</i>	Hillside Burrgrass		Not listed	Not listed	Tozer et al. (2010)
<i>Echinopogon ovatus</i>	Forest Hedgehog Grass		Not listed	Not listed	NSW Scientific Committee (2011)
<i>Anthosachne scabra</i>	Common Wheat Grass		Not listed	Not listed	NSW Scientific Committee (2011)
<i>Lomandra longifolia</i>	Mat Rush		Not listed	Not listed	NSW Scientific Committee (2011)
<i>Microlaena stipoides</i>	Weeping Grass		Not listed	Not listed	NSW Scientific Committee (2011)
<i>Rytidosperma longifolium</i>	Long-leaved Wallaby Grass		Not listed	Not listed	NSW Scientific Committee (2011)
<i>Oplismenus imbecillis</i>	Creeping Beard Grass		Not listed	Not listed	NSW Scientific Committee (2011)

¹ For woody species, the likely fire response is given as: R = resprouter, St = stem resprouter only, B = basal resprouter only, OS = non-resprouter, U = resprouter-type unknown. Species of conservation concern are indicated with *. Species marked with † are predicted to occur within the ecological community but may not have been observed. Sources for fire responses: (Benson and McDougall, 1993, Benson and McDougall, 1994, Benson and McDougall, 1995, Benson and McDougall, 1996, Benson and McDougall, 1997, Benson and McDougall, 1998, Benson and McDougall, 1999, Benson and McDougall, 2000, Benson and McDougall, 2001, Nicolle, 2006, Clarke et al., 2009).

² Species listed under the EPBC Act at the time this document was prepared. Source: <https://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>

³ Species listed under the State Act at the time this document was prepared. Source: <https://www.environment.nsw.gov.au/threatenedspeciesapp/>

Sources: (Tozer et al., 2010, NSW Scientific Committee, 2011, DAWE, 2021d).

A2 Fauna

Table 4: Fauna likely or known to occur in the ecological community. Species of conservation concern are indicated with *.

Scientific name	Common name/s	EPBC status ¹	State status ²	Source
Mammals				
* <i>Dasyurus maculatus</i>	Bindjulang, Spot-tailed Quoll	Endangered	Vulnerable	DAWE (2021d)
* <i>Petauroides volans</i>	Greater Glider	Vulnerable	Not listed	DAWE (2021d)
* <i>Phascolarctos cinereus</i>	Koala	Vulnerable	Vulnerable	DAWE (2021d)
* <i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	Vulnerable	Vulnerable	DAWE (2021d)
<i>Tachyglossus aculeatus</i>	Short-beaked Echidna	Not listed	Not listed	DPIE survey (ALA, 2021)
<i>Vombatus ursinus</i>	Common Wombat	Not listed	Not listed	DPIE survey (ALA, 2021)
Birds				
<i>Acanthiza chrysorrhoa</i>	Yellow-tail	Not listed	Not listed	Unknown (ALA, 2021)
<i>Acanthiza lineata</i>	Striated Thornbill	Not listed	Not listed	Unknown (ALA, 2021)
<i>Acanthiza nana</i>	Yellow Thornbill	Not listed	Not listed	Unknown (ALA, 2021)
<i>Acanthiza pusilla</i>	Brown Thornbill	Not listed	Not listed	Unknown (ALA, 2021)
<i>Acanthiza reguloides</i>	Buff-rumped Thornbill	Not listed	Not listed	Unknown (ALA, 2021)
<i>Acanthorhynchus tenuirostris</i>	Eastern Spinebill	Not listed	Not listed	Unknown (ALA, 2021)
<i>Accipiter fasciatus</i>	Brown Goshawk	Marine	Not listed	Unknown (ALA, 2021)
<i>Accipiter novaehollandiae</i>	Grey Goshawk	Not listed	Not listed	Unknown (ALA, 2021)
<i>Acrocephalus australis</i>	Australian Reed Warbler	Marine	Not listed	Unknown (ALA, 2021)
<i>Alisterus scapularis</i>	Australian King-parrot	Not listed	Not listed	Unknown (ALA, 2021)
<i>Anthochaera carunculata</i>	Red wattlebird	Not listed	Not listed	Unknown (ALA, 2021)
* <i>Anthochaera phrygia</i>	Regent Honeyeater	Critically Endangered	Critically Endangered	DAWE (2021d)
<i>Anthus novaeseelandiae</i>	Australian Pipit	Marine	Not listed	Unknown (ALA, 2021)
<i>Aquila audax</i>	Wedge-tailed Eagle	Not listed	Not listed	Unknown (ALA, 2021)

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<i>Ardea pacifica</i>	White-necked Heron	Not listed	Not listed	Unknown (ALA, 2021)
<i>*Artamus cyanopterus</i>	Dusky Woodswallow	Not listed	Vulnerable	Unknown (ALA, 2021)
<i>Artamus superciliosus</i>	White-browed woodswallow	Not listed	Not listed	Unknown (ALA, 2021)
<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	Not listed	Not listed	Unknown (ALA, 2021)
<i>Cacomantis flabelliformis</i>	Fan-tailed Cuckoo	Marine	Not listed	Unknown (ALA, 2021)
<i>Cacomantis pallidus</i>	Pallid Cuckoo	Marine	Not listed	Unknown (ALA, 2021)
<i>Cacomantis variolosus</i>	Brush Cuckoo	Not listed	Not listed	Unknown (ALA, 2021)
<i>*Callocephalon fimbriatum</i>	Gang-gang Cockatoo	Not listed	Vulnerable	Unknown (ALA, 2021)
<i>Calyptorhynchus funereus</i>	Yellow-tailed Black-cockatoo	Not listed	Not listed	Unknown (ALA, 2021)
<i>Ceyx azureus</i>	Azure Kingfisher	Not listed	Not listed	Unknown (ALA, 2021)
<i>Chalcites basalis</i>	Horsfield's Bronze-cuckoo	Marine	Not listed	Unknown (ALA, 2021)
<i>Chalcites lucidus</i>	Shining Bronze-cuckoo	Marine	Not listed	Unknown (ALA, 2021)
<i>Chenonetta jubata</i>	Maned Duck	Not listed	Not listed	Unknown (ALA, 2021)
<i>*Chthonicola sagittata</i>	Speckled Warbler	Not listed	Vulnerable	Unknown (ALA, 2021)
<i>Cincloramphus cruralis</i>	Brown Songlark	Not listed	Not listed	Unknown (ALA, 2021)
<i>Cincloramphus mathewsi</i>	Rufous Songlark	Not listed	Not listed	Unknown (ALA, 2021)
<i>Cinclosoma punctatum</i>	Spotted Quail-thrush	Not listed	Not listed	Unknown (ALA, 2021)
<i>Climacteris erythrops</i>	Red-browed Treecreeper	Not listed	Not listed	Unknown (ALA, 2021)
<i>Colluricincla harmonica</i>	Grey Shrike-thrush	Not listed	Not listed	Unknown (ALA, 2021)
<i>Coracina novaehollandiae</i>	Black-faced cuckoo-shrike	Marine	Not listed	Unknown (ALA, 2021)
<i>Coracina tenuirostris</i>	Cicadabird	Marine	Not listed	Unknown (ALA, 2021)
<i>Corcorax melanorhamphos</i>	White-winged Chough	Not listed	Not listed	Unknown (ALA, 2021)
<i>Cormobates leucophaea</i>	White-throated Treecreeper	Not listed	Not listed	Unknown (ALA, 2021)
<i>Corvus coronoides</i>	Australian Raven	Not listed	Not listed	Unknown (ALA, 2021)

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<i>Corvus mellori</i>	Little Raven	Marine	Not listed	Unknown (ALA, 2021)
<i>Cracticus torquatus</i>	Grey Butcherbird	Not listed	Not listed	Unknown (ALA, 2021)
<i>Dacelo novaeguineae</i>	Kookaburra	Not listed	Not listed	Unknown (ALA, 2021)
<i>*Daphoenositta chrysoptera</i>	Varied Sittella	Not listed	Vulnerable	DPIE (2021c)
<i>Dicaeum hirundinaceum</i>	Mistletoebird	Not listed	Not listed	Unknown (ALA, 2021)
<i>Egretta novaehollandiae</i>	White-faced Heron	Not listed	Not listed	Unknown (ALA, 2021)
<i>Eolophus roseicapilla</i>	Galah	Not listed	Not listed	Unknown (ALA, 2021)
<i>Eopsaltria australis</i>	Eastern Yellow Robin	Not listed	Not listed	Unknown (ALA, 2021)
<i>Eurystomus orientalis</i>	Eastern broad-billed Roller	Marine	Not listed	Unknown (ALA, 2021)
<i>Falco berigora</i>	Brown Falcon	Not listed	Not listed	Unknown (ALA, 2021)
<i>Falco cenchroides</i>	Nankeen Kestrel	Marine	Not listed	Unknown (ALA, 2021)
<i>Falco longipennis</i>	Australian Hobby	Not listed	Not listed	Unknown (ALA, 2021)
<i>Falcunculus frontatus</i>	Crested Shrike-tit	Not listed	Not listed	Unknown (ALA, 2021)
<i>Gallinago hardwickii</i>	Latham's Snipe	Marine; Migratory (EPBC Act, Bonn, JAM BA, ROKAMB A)	Not listed	Unknown (ALA, 2021)
<i>Gerygone olivacea</i>	White-throated Gerygone	Not listed	Not listed	Unknown (ALA, 2021)
<i>Grallina cyanoleuca</i>	Magpie-lark	Not listed	Not listed	Unknown (ALA, 2021)
<i>*Grantiella picta</i>	Painted Honeyeater	Vulnerable	Vulnerable	DAWE (2021d)
<i>Gymnorhina tibicen</i>	Australian Magpie	Not listed	Not listed	Unknown (ALA, 2021)
<i>Haliastur sphenurus</i>	Whistling Kite	Marine	Not listed	Unknown (ALA, 2021)
<i>*Hieraetus morphnoides</i>	Little Eagle	Not listed	Vulnerable	Unknown (ALA, 2021)
<i>*Hirundapus caudacutus</i>	White-throated Needletail	Vulnerable	Not listed	DAWE (2021d)
<i>Hirundo neoxena</i>	Welcome Swallow	Not listed	Not listed	Unknown (ALA, 2021)
<i>Lalage sueurii</i>	White-winged Triller	Not listed	Not listed	Unknown (ALA, 2021)
<i>*Lathamus discolor</i>	Swift Parrot	Critically Endangered	Endangered	DAWE (2021d)
<i>Leucosarcia melanoleuca</i>	Wonga Pigeon	Not listed	Not listed	Unknown (ALA, 2021)

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<i>Malurus cyaneus</i>	Superb Fairy-wren	Not listed	Not listed	Unknown (ALA, 2021)
<i>Manorina melanocephala</i>	Noisy Miner	Not listed	Not listed	Unknown (ALA, 2021)
<i>Manorina melanophrys</i>	Bell Miner	Not listed	Not listed	Unknown (ALA, 2021)
<i>*Melanodryas cucullata</i>	Hooded Robin	Not listed	Vulnerable	Unknown (ALA, 2021)
<i>Meliphaga lewinii</i>	Lewin's Honeyeater	Not listed	Not listed	Unknown (ALA, 2021)
<i>Melithreptus brevirostris</i>	Brown-headed Honeyeater	Not listed	Not listed	Unknown (ALA, 2021)
<i>Melithreptus lunatus</i>	White-naped Honeyeater	Not listed	Not listed	Unknown (ALA, 2021)
<i>Menura novaehollandiae</i>	Superb Lyrebird	Not listed	Not listed	Unknown (ALA, 2021)
<i>Merops ornatus</i>	Rainbow Bee-eater	Marine	Not listed	Unknown (ALA, 2021)
<i>Microeca fascians</i>	Jacky Winter	Not listed	Not listed	Unknown (ALA, 2021)
<i>Monarcha melanopsis</i>	Black-faced Monarch	Marine; Migratory (EPBC Act, Bonn)	Not listed	Unknown (ALA, 2021)
<i>Myiagra inquieta</i>	Restless Flycatcher	Not listed	Not listed	Unknown (ALA, 2021)
<i>Myiagra rubecula</i>	Leaden Flycatcher	Not listed	Not listed	Unknown (ALA, 2021)
<i>Neochmia temporalis</i>	Red-browed Finch	Not listed	Not listed	Unknown (ALA, 2021)
<i>Nesoptilotis leucotis</i>	White-eared Honeyeater	Not listed	Not listed	Unknown (ALA, 2021)
<i>Ninox novaeseelandiae</i>	Southern Boobook	Marine	Not listed	Unknown (ALA, 2021)
<i>*Ninox strenua</i>	Powerful Owl	Not listed	Vulnerable	Unknown (ALA, 2021)
<i>Oriolus sagittatus</i>	Olive-backed Oriole	Not listed	Not listed	Unknown (ALA, 2021)
<i>Pachycephala pectoralis</i>	Golden Whistler	Not listed	Not listed	Unknown (ALA, 2021)
<i>Pachycephala rufiventris</i>	Rufous Whistler	Not listed	Not listed	Unknown (ALA, 2021)
<i>Pardalotus punctatus</i>	Spotted Pardalote	Not listed	Not listed	Unknown (ALA, 2021)
<i>Pardalotus striatus</i>	Striated Pardalote	Not listed	Not listed	Unknown (ALA, 2021)
<i>Petrochelidon ariel</i>	Fairy Martin	Not listed	Not listed	Unknown (ALA, 2021)
<i>Petrochelidon nigricans</i>	Tree Martin	Marine	Not listed	Unknown (ALA, 2021)
<i>Petroica boodang</i>	Scarlet Robin	Not listed	Not listed	Unknown (ALA, 2021)
<i>*Petroica phoenicea</i>	Flame Robin	Marine	Vulnerable	Unknown (ALA, 2021)
<i>Phaps chalcoptera</i>	Common Bronzewing	Not listed	Not listed	Unknown (ALA, 2021)

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<i>Philemon corniculatus</i>	Noisy Friarbird	Not listed	Not listed	Unknown (ALA, 2021)
<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater	Not listed	Not listed	Unknown (ALA, 2021)
<i>Phylidonyris pyrrhoptera</i>	Crescent Honeyeater	Not listed	Not listed	Unknown (ALA, 2021)
<i>Platycercus elegans</i>	Crimson Rosella	Not listed	Not listed	Unknown (ALA, 2021)
<i>Platycercus eximius</i>	Eastern Rosella	Not listed	Not listed	Unknown (ALA, 2021)
<i>Psephotus haematonotus</i>	Red-rumped Parrot	Not listed	Not listed	Unknown (ALA, 2021)
<i>Psophodes olivaceus</i>	Eastern Whipbird	Not listed	Not listed	Unknown (ALA, 2021)
<i>Ptilonorhynchus violaceus</i>	Satin Bowerbird	Not listed	Not listed	Unknown (ALA, 2021)
<i>Ptilotula penicillata</i>	White-plumed Honeyeater	Not listed	Not listed	Unknown (ALA, 2021)
<i>Rhipidura albiscapa</i>	Grey Fantail	Not listed	Not listed	Unknown (ALA, 2021)
<i>Rhipidura leucophrys</i>	Willie Wagtail	Not listed	Not listed	Unknown (ALA, 2021)
<i>Rhipidura rufifrons</i>	Rufous Fantail	Marine; Migratory (EPBC Act, Bonn)	Not listed	Unknown (ALA, 2021)
<i>Scythrops novaehollandiae</i>	Channel-billed Cuckoo	Marine	Not listed	Unknown (ALA, 2021)
<i>Sericornis frontalis</i>	White-browed Scrubwren	Not listed	Not listed	Unknown (ALA, 2021)
<i>Smicrornis brevirostris</i>	Weebill	Not listed	Not listed	Unknown (ALA, 2021)
<i>Stagonopleura guttata</i>	Diamond Firetail	Not listed	Not listed	Unknown (ALA, 2021)
<i>Stizoptera bichenovii</i>	Double-barred Finch	Not listed	Not listed	Unknown (ALA, 2021)
<i>Strepera graculina</i>	Pied Currawong	Not listed	Not listed	Unknown (ALA, 2021)
<i>Strepera versicolor</i>	Grey Currawong	Not listed	Not listed	Unknown (ALA, 2021)
<i>Todiramphus sanctus</i>	Sacred Kingfisher	Marine	Not listed	Unknown (ALA, 2021)
<i>Vanellus miles</i>	Masked Lapwing	Not listed	Not listed	Unknown (ALA, 2021)
<i>Zosterops lateralis</i>	Silvereye	Marine	Not listed	Unknown (ALA, 2021)
Reptiles				
<i>Pseudemoia entrecasteauxii</i>	Tussock Cool-skink	Not listed	Not listed	Other survey (ALA, 2021)
<i>Lampropholis guichenoti</i>	Pale-flecked Garden Sunskink	Not listed	Not listed	Other survey (ALA, 2021)

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<i>Eulamprus heatwolei</i>	Yellow-bellied Water-skink	Not listed	Not listed	Other survey (ALA, 2021)
Amphibians				
<i>Crinia signifera</i>	Common Froglet	Not listed	Not listed	DPIE survey (ALA, 2021)
<i>Litoria peronii</i>	Peron's Tree Frog	Not listed	Not listed	DPIE survey (ALA, 2021)
<i>*Heleioporus australiacus</i>	Giant Burrowing Frog	Vulnerable	Vulnerable	DAWE (2021d)
Fish				
<i>Anguilla australis</i>	Shortfin Eel	Not listed	Not listed	DPIE survey (ALA, 2021)
<i>Galaxias olidus</i>	Inland Galaxias	Not listed	Not listed	DPIE survey (ALA, 2021)
<i>*Prototroctes maraena</i>	Australian Grayling	Vulnerable	Not listed	DAWE (2021d)
Invertebrates				
<i>Egilodonta paucidentata</i>	Braidwood Pinwheel Snail	Not listed	Not listed	Other survey (ALA, 2021)
<i>Aphaenogaster longiceps</i>	NA	Not listed	Not listed	CSIRO (ALA, 2021)
<i>Heteronympha merope</i>	Common Brown	Not listed	Not listed	Citizen science (ALA, 2021)
<i>*Synemon plana</i>	Golden Sun Moth	Critically Endangered	Endangered	DAWE (2021d)
¹ Species listed under the EPBC Act at the time this document was prepared. Source: https://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl ² Species listed under the State Act at the time this document was prepared. Source: https://www.environment.nsw.gov.au/threatenedspeciesapp/				

Sources: (ALA, 2021, DAWE, 2021d)

Consultation Questions on the species lists

- Are the lists of flora and fauna accurate? If not, what species should be added or removed?

Appendix B - Relationship to other vegetation classification and mapping systems

Ecological communities are complex to classify. States and Territories apply their own systems to classify vegetation communities. Reference to vegetation and mapping units as equivalent to the ecological community, at the time of listing, should be taken as indicative rather than definitive. A unit that is generally equivalent may include elements that do not meet the key diagnostics and minimum condition thresholds. Conversely, areas mapped or described as other units may sometimes meet the key diagnostics for the ecological community. Judgement of whether the ecological community is present at a particular site should focus on how the site meets the description ([section 1.2](#)), the key diagnostic characteristics ([section 2.1](#)) and minimum condition thresholds ([section 2.3](#)).

State vegetation mapping units are not the ecological community being listed. However, for many sites (but not all) certain vegetation map units will correspond sufficiently to provide indicative mapping for the national ecological community, where the description matches. On-ground assessment is vital to finally determine if any patch is part of the ecological community.

Table 5: Key features of vegetation types/mapping units that correspond or are considered equivalent to Araluen Scarp Grassy Forest.

Classification system	Name	Key distinguishing features
Corresponding map units		
NSW TEC	Araluen Scarp Grassy Forest in the South East Corner Bioregion	<ul style="list-style-type: none"> • Open forest to woodland with a canopy typically dominated by <i>E. maideni</i>, <i>E. melliodora</i> and <i>E. tereticornis</i>, though a number of other eucalypt species may be present • Typically contains an open shrub layer of <i>Hymenanthera dentata</i>, <i>Pittosporum undulatum</i>, vines and climbers • Sparse, grassy ground layer • Restricted to north and west sides of Araluen Valley, NSW • Occurs on sandy, granite-derived loams on slopes and ridges between 200 – 700 m elevation • Considered equivalent to the TEC
NSW SCIVI	DSF p343: Araluen Scarp Grassy Forest	<ul style="list-style-type: none"> • Eucalypt woodland with a canopy typically co-dominated by <i>E. maidenii</i>, <i>E. melliodora</i>, <i>A. floribunda</i> and <i>E. globoidea</i>, though other eucalypt species may be present • Typically contains an open shrub layer and groundcover of forbs, grasses, ferns and climbers • Occurs on sandy-granite derived loams on steep slopes on north and west sides of Araluen Valley, NSW • Occurs between 200 – 700 m elevation within rain shadow zone • Considered equivalent to the TEC

Classification system	Name	Key distinguishing features
Corresponding map units		
NSW SVTM	3313: Araluen Scarp Grassy Forest	<ul style="list-style-type: none"> This open forest/woodland is characterised as tall <i>Eucalyptus tereticornis</i> is almost always present as a canopy tree. <i>Bursaria spinosa</i> is occasionally present in the understorey In addition to the Araluen Valley area, this community also occurs at Nelligen Creek, Donovan Creek and Merricumbene Valley Considered equivalent to the TEC
Thomas et al. (2000)	FE51: Araluen Acacia Herb/Grass Dry Forest	<ul style="list-style-type: none"> NSW TEC listing considers this community to be part of the TEC
Tindall et al. (2004)	343: Araluen Scarp Grassy Forest	<ul style="list-style-type: none"> NSW TEC listing considers this equivalent to the TEC
Gellie et al. (2005)	G51: Araluen Acacia Herb Dry Grass Forest <i>Eucalyptus melliodora</i> / <i>E. maidenii</i>	<ul style="list-style-type: none"> NSW TEC listing considers some elements of this community to be part of the TEC

Sources: NSW SVTM: NSW Plant Community Type (DPIE, 2021b), NSW TEC: NSW Threatened Ecological Community mapping, NSW SCIVI: Southeast NSW Native Vegetation Classification and Mapping (NSW DPIE, version 14).

Table 6: Key features distinguishing Araluen Scarp Grassy Forest from other vegetation types/mapping units that may be adjacent to the ecological community.

Classification system	Name	Key distinguishing features
Woodlands and grassy forests		
NSW SVTM	3332: Southeast Lowland Grassy Woodland	<ul style="list-style-type: none"> Typically occurs below 500 m elevation Does not contain species associated with rainforest flora. Has substantial grass cover (e.g. 40 to 90%)
NSW TEC	Lowland Grassy Woodland in the South East Corner Bioregion	
EPBC	Lowland Grassy Woodland in the South East Corner Bioregion	
NSW SCIVI	e20: Southeast Lowland Grassy Woodland	
NSW SCIVI	GW p220: Southern Tableland Flats Forest	<ul style="list-style-type: none"> Occurs on flat to undulating terrain Extends to higher elevation, from 600 m to 1150 m Grass cover continuous Dominant <i>Eucalyptus</i> species are <i>E. viminalis</i>, <i>E. pauciflora</i> and <i>E. radiata</i> Plant Community Type (PCT) 3951 is restricted to intermittently inundated swampy areas within depressions along tableland ranges. <i>E. dalrympleana</i> may also be present. Shrub layer generally usually present. Range extends to 1400 m elevation
NSW SVTM	3348: Southern Tableland Granites Ribbon Gum Grassy Forest	
NSW SVTM	3348: Southern Tableland Granites Ribbon Gum Grassy Forest	

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Classification system	Name	Key distinguishing features
NSW SVTM	3951: Southern Tableland Ranges Boggy Open Woodland	
TEC	River Flat Eucalypt Forest on Coastal Floodplains	<ul style="list-style-type: none"> Occurs on alluvial flat areas along the margins of floodplains and waterways Tree canopy typically over 20 m high TEC community typically has a dense groundcover of <i>Lomandra longifolia</i> Overlap of species with Araluen Scarp Grassy Forest, but landscape position should distinguish
EPBC	River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	
NSW SVTM	3188: South Coast Riverflat Peppermint Forest	
NSW SVTM	3325: South Coast Valley Flats Ribbon Gum Forest	<ul style="list-style-type: none"> Tall forest that occurs on creek flats only Canopy dominated by <i>E. viminalis</i>, <i>E. melliodora</i>, with <i>Acacia melanoxylon</i> sometimes present Numerous <i>Acacia</i> species in the mid-storey, including <i>A. implexa</i>, <i>A. mearnsii</i>
NSW SVTM	3331: Southeast Gorge Dry Forest	<ul style="list-style-type: none"> Tall forest or woodland occurring at lower elevations on slopes within gorges. Canopy dominated by <i>A. floribunda</i> and stringybark eucalypts Contains a mid-storey of <i>Allocasuarina littoralis</i>, <i>Persoonia linearis</i> and <i>Acacia mearnsii</i> Typically contains a sclerophyllous shrub layers and patchy grasses
Wet sclerophyll forests		
NSW SCIVI	WSF e12: Mountain Wet Fern Forest	<ul style="list-style-type: none"> Usually over 32 m canopy height Groundcover is dominated by ferns Multi-layered mid-storey containing tree ferns (e.g. <i>Cyathea australis</i>) Dominant <i>Eucalyptus</i> species are <i>E. cypellocarpa</i> and <i>E. fastigata</i> Generally occurs at sheltered sites at higher elevations
NSW SVTM	3219: Southeast Mountain Wet Fern Forest	
NSW SVTM	3107: South Coast Red Gum-Fig Sheltered Forest	<ul style="list-style-type: none"> Very tall open forest with canopy dominated by <i>E. tereticornis</i> or <i>E. maidenii</i> Typically contains a dense canopy sub-stratum of <i>F. rubiginosa</i>, <i>P. undulatum</i> and acacia species Only one patch known within Araluen region at 640 m elevation
NSW SVTM	3181: Bega Wet Shrub Forest	<ul style="list-style-type: none"> Occurs in drainage lines and moist lower slopes. <i>Eucalyptus elata</i> is a common dominant canopy species.
NSW SVTM	4138: Araluen Valley Flats Red Gum Forest	<ul style="list-style-type: none"> Occurs on lower slopes at elevations below 90 m. Has greater grass cover.

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Classification system	Name	Key distinguishing features
NSW SVTM	3303: Central Tableland Ribbon Gum Sheltered Forest	<ul style="list-style-type: none">• Very to extremely tall wet forest with canopy dominated by <i>E. viminalis</i>• Small tree layer typically contains <i>Acacia melanoxylon</i>• Found within deep gorges and associated slopes on a variety of substates
NSW SVTM	3190: South Coast Hinterland Monkey Gum Wet Fern Forest	<ul style="list-style-type: none">• Very tall, wet open forest, with groundcover dominated by ferns• Canopy typically dominated by <i>E. cypellocarpa</i>• Layer of small trees typically contains <i>Bedfordia arborescens</i>, <i>Pomaderris aspera</i>, <i>Acacia falciformis</i>
NSW SVTM	3191: South Coast Ranges Moist Gully Forest	<ul style="list-style-type: none">• Tall wet forest occurring in gullies and sheltered aspects, generally below 500 m elevation within higher rainfall areas• Canopy trees present may include <i>E. muelleriana</i>, <i>Syncarpia glomulifera</i>, <i>E. paniculata</i>, <i>A. floribunda</i>, <i>E. botryoides</i>• Complex mid-story and understorey vegetation typical of wet forest
Rainforests		
NSW SCIVI	RF e1: Southeast Dry Rainforest	<ul style="list-style-type: none">• Canopy typically closed• Low, dense canopy dominated by <i>Ficus rubiginosa</i>, with <i>Pittosporum undulatum</i>, <i>Brachychiton populneus</i> and emergent eucalypts occurring occasionally• Occurs on north-facing slopes• Patch-size usually small, less than 10 ha
NSW TEC	Dry Rainforest of the South East Forests in the South East Corner Bioregion	
NSW SCIVI	RF p38: Grey Myrtle Dry Rainforest	<ul style="list-style-type: none">• Low closed forest• Canopy typically dominated by <i>Backhousia myrtifolia</i>
NSW SVTM	3046: Southeast Warm Temperate Rainforest	<ul style="list-style-type: none">• Only found in steep, sheltered gullies• Dense canopy dominated by <i>Syzigium smithii</i>, <i>Pittosporum undulatum</i>, <i>Doryphora sassafras</i>, <i>Ceratopetalum apetalum</i> with sub-stratum of tree ferns• Contains lianas and epiphytic species• May contain large emergent eucalypts• NSW PCT 3045 occurs at low elevations in higher rainfall areas, tree ferns may be absent• PCT 3036 has higher canopy diversity, palms may be present and is not restricted to gullies. Tree ferns may be absent
NSW SVTM	3045: South Coast Temperate Gully Rainforest	
NSW SVTM	3036: South Coast Warm Temperate-Subtropical Rainforest	
NSW SVTM	3037: Sydney Basin Warm Temperate Rainforest	
Dry sclerophyll forests		
NSW SCIVI	DSF p 98: Clyde-Deua Ridgetop Forest	<ul style="list-style-type: none">• Occurs on ridgetops• Lacks eucalypt species associated with woodlands, such as <i>E. tereticornis</i>, <i>E. melliodora</i>• Does not contain <i>E. maidenii</i>• Open, sclerophyllous understorey

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Classification system	Name	Key distinguishing features
NSW SVTM	3659: South Coast Hinterland Silvertop Ash Forest	<ul style="list-style-type: none"> Tall, dry open forest with sclerophyllous shrubs and sparse grasses and ferns Canopy typically dominated by <i>E. sieberi</i> and stringybark eucalypts PCT 3665 is more likely to occur at higher elevations
NSW SVTM	3665: Southeast Hinterland Silvertop Ash-Stringybark Forest	
NSW SCIVI	DSF p98: Batemans Bay Foothills Forest	<ul style="list-style-type: none"> Occurs on ridgetops and dry slopes Lacks eucalypt species associated with grassy woodlands, such as <i>E. tereticornis</i>, <i>E. melliodora</i> Dominant tree species are usually <i>E. agglomerata</i>, <i>E. sieberi</i>, <i>E. consideriana</i>, <i>Corymbia gummifera</i> Does not contain <i>E. maidenii</i> Open understorey with shrubs, forbs, grasses
NSW SVTM	3300: Southeast Escarpment Peaks Dry Shrub Forest	<ul style="list-style-type: none"> Tall to very tall open forest with canopy typically dominated by <i>E. dalrympleana</i> and <i>E. radiata</i> Multi-layered mid-storey of sclerophyllous shrubs Occurs on gentle slopes on a range of substrates
NSW SVTM	3452: Southeast Hinterland Dry Grassy Forest	<ul style="list-style-type: none"> Occurs on exposed west or north-facing slopes Occurs on most substrates with a high proportion of quartz <i>Acacia falciformis</i> occur occasionally as a small tree Typically has moderately dense groundcover of the tussock grass <i>Poa meionectes</i>
NSW SVTM	3651: Gourock Range Peppermint-Ash Shrub Forest	<ul style="list-style-type: none"> Dry, shrubby tall forest that occurs on exposed slopes at higher elevations Canopy dominated by <i>E. sieberi</i> and <i>E. radiata</i> Stratum of small trees containing <i>Acacia falciformis</i> <i>Leucopogon lanceolatus</i> almost always present in understorey
NSW SVTM	3660: South Coast Hinterland Yellow Stringybark Forest	<ul style="list-style-type: none"> Tall, dry and shrubby sclerophyll forest found on exposed slopes, ranges and foothills Canopy typically dominated by <i>E. muelleriana</i>, <i>E. sieberi</i> and <i>A. floribunda</i> Very sparse shrub layer, <i>Persoonia linearis</i> and <i>Acacia falciformis</i> usually present Occurs on quartz-rich sediments, granites
NSW SVTM	3657: South Coast Foothills Monkey Gum Sheltered Forest	<ul style="list-style-type: none"> Tall, dry shrubby forest occurring on upper slopes of sandstone country Canopy dominated by <i>E. cypellocarpa</i> and <i>E. muelleriana</i> Ground layer is dominated by ferns
NSW SVTM	3656: South Coast Foothills Dry Shrub Forest	<ul style="list-style-type: none"> Tall, dry open sclerophyll forest with sparse shrub layer and sparse groundcover of grasses Canopy is typically dominated by stringybark eucalypts, along with <i>E. sieberi</i> <i>Allocasuarina littoralis</i> and <i>Acacia falciformis</i> are typically present in the mid-storey Occurs on exposed ridges and upper slopes
Other vegetation types		

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Classification system	Name	Key distinguishing features
NSW SCIVI	FoW P32: Riverbank Forest	<ul style="list-style-type: none"> • Tall forest dominated by <i>Casuarina cunninghamiana</i> occurring along major waterways • Restricted to alluvial substrates
NSW SVTM	3311: Southeast Escarpment Ash Forest	<ul style="list-style-type: none"> • Tall open forest occurring on exposed sites escarpment rim, typically with substantial areas of rock • <i>Eucalyptus fraxinoides</i> is the dominant canopy species • Patchy understorey
NSW SVTM	4084: Southern Escarpment River Oak Forest	

Sources: NSW SVTM: NSW Plant Community Type (DPIE, 2021b) NSW TEC: NSW Threatened Ecological Community mapping, EPBC: communities listed under the EPBC Act 1999, NSW SCIVI: Southeast NSW Native Vegetation Classification and Mapping (NSW DPIE, version 14).

Consultation Questions on map units

- Does the list of current and superseded map units and classifications include all those that may be related to the ecological community?
- Are the key distinguishing features sufficient to differentiate other vegetation types from the ecological community?

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