

NSW SCIENTIFIC COMMITTEE

Final Determination

The Scientific Committee, established by the *Threatened Species Conservation Act* 1995 (the Act), has made a Final Determination under Section 23 of the Act to list Elderslie Banksia Scrub Forest in the Sydney Basin Bioregion as a CRITICALLY ENDANGERED ECOLOGICAL COMMUNITY in Part 2 of Schedule 1A of the Act and, as a consequence, to omit reference to Elderslie Banksia Scrub Forest Community as an Endangered Ecological Community on Part 3 of Schedule 1 of the Act.

This determination contains the following information:

- Parts 1 & 2:** Section 4 of the Act defines an ecological community as “an assemblage of species occupying a particular area”. These defining features of Elderslie Banksia Scrub Forest in the Sydney Basin Bioregion are described in Parts 1 and 2 of this Determination, respectively.
- Part 3:** Part 3 of this Determination describes the eligibility for listing of this ecological community in Part 2 of Schedule 1A of the Act according to criteria as prescribed by the *Threatened Species Conservation Regulation* 2010.
- Part 4:** Part 4 of this Determination provides additional information intended to aid recognition of this community in the field.

Part 1. Assemblage of species

- 1.1 Elderslie Banksia Scrub Forest in the Sydney Basin Bioregion (hereafter Elderslie Banksia Scrub Forest) is characterised by the assemblage of species listed below.

<i>Acacia decurrens</i>	<i>Glycine clandestina</i>
<i>Acacia ulicifolia</i>	<i>Gompholobium minus</i>
<i>Angophora subvelutina</i>	<i>Hibbertia diffusa</i>
<i>Aotus ericoides</i>	<i>Imperata cylindrica</i>
<i>Aristida ramosa</i> subsp. <i>ramosa</i>	<i>Kennedia rubicunda</i>
<i>Banksia integrifolia</i>	<i>Kunzea ambigua</i>
<i>Brachyloma daphnoides</i>	<i>Leptospermum polygalifolium</i> subsp. <i>polygalifolium</i>
<i>Clerodendrum tomentosum</i>	<i>Lomandra longifolia</i>
<i>Dianella revoluta</i>	<i>Melaleuca decora</i>
<i>Dichondra repens</i>	<i>Persoonia linearis</i>
<i>Dillwynia glaberrima</i>	<i>Phyllanthus gunnii</i>
<i>Duboisia myoporoides</i>	<i>Pimelea linifolia</i>
<i>Eragrostis brownii</i>	<i>Platysace lanceolata</i>
<i>Eucalyptus botryoides</i>	<i>Pteridium esculentum</i>
<i>Exocarpos cupressiformis</i>	<i>Ricinocarpus pinifolius</i>
<i>Gahnia clarkei</i>	<i>Veronica plebeia</i>
<i>Gleichenia dicarpa</i>	

- 1.2 The total species list of the community across all occurrences is likely to be considerably larger than that given above, with many species present above-ground in only one or two sites or in low abundance. Because of natural variation across the range

NSW SCIENTIFIC COMMITTEE

of the community, the number of species present at any particular site is thus likely to be considerably less than the total listed above.

Characteristic species may be abundant or rare and comprise only a subset of the complete list of species recorded in known examples of the community. Some characteristic species show a high fidelity (are relatively restricted) to the community, but may also occur in other communities, while others are more typically found in a range of communities.

The number and identity of species recorded at a site is a function of sampling scale and effort. In general, the number of species recorded is likely to increase with the size of the site and there is a greater possibility of recording species that are rare in the landscape.

Species presence and relative abundance (dominance) will vary from site to site as a function of environmental factors such as soil properties (chemical composition, texture, depth, drainage), topography and climate and through time as a function of disturbance (*e.g.* fire, logging, grazing) and weather (*e.g.* flooding, drought, extreme heat or cold).

At any one time, above ground individuals of some species may be absent but the species may be represented below ground in the soil seed bank or as dormant structures such as bulbs, corms, rhizomes, rootstocks or lignotubers.

The species listed above are vascular plants, however the community also includes micro-organisms, fungi, cryptogamic plants and a diverse vertebrate and invertebrate fauna. These components of the community are less well documented.

Part 2. Particular area occupied by the ecological community

- 2.1 The assemblage of species listed in Part 1.1 above which characterises the Elderslie Banksia Scrub Forest occurs within the Sydney Basin Bioregion. This Bioregion is defined by SEWPaC (2012) Interim Biogeographic Regionalisation for Australia, Version 7. Department of Sustainability, Environment, Water, Population and Communities.
<http://www.environment.gov.au/parks/nrs/science/bioregion-framework/ibra/maps.html>
- 2.2 It is the intent of the Scientific Committee that all occurrences of the ecological community (both recorded and as yet unrecorded and independent of their condition) that occur within this bioregion be covered by this Determination.

Part 3. Eligibility for listing

- 3.1.1 Occurrences of Elderslie Banksia Scrub Forest have been reduced to very small fragmented remnants by clearing and sand extraction. No reliable estimate of the pre-European distribution is available. Estimates of the current distribution range from 17.3 ha (Clements 2002) to <15 ha (Tozer *et al.* 2010). Clements (2002) identified a total of 12 separate remnant patches, five of which were relatively intact, two were

NSW SCIENTIFIC COMMITTEE

intact but with less native species representation and five were in poor condition. Six of the patches were 1 – 3.2 ha in size, the rest were 0.13 – 0.9 ha (Clements 2002). The patches are localised to the Spring Farm area near Camden (Clements *et al.* 2002) and, even in the intact stands native species richness is low, indicating their degraded nature (M. Tozer *in litt.* Feb 2014). No occurrences of Elderslie Banksia Scrub Forest are presently included in conservation reserves (Tozer *et al.* 2010).

3.1.2 The extent of occurrence (EOO) and area of occupancy (AOO) of Elderslie Banksia Scrub Forest are estimated to be 4 km². The estimate of AOO is based on one 2 x 2 km grid cell, the scale recommended for assessing AOO by IUCN (2014). The geographic distribution of Elderslie Banksia Scrub Forest is thus very highly restricted.

3.1.3 The remnants of Elderslie Banksia Scrub Forest are subject to a range of threats. Land clearing has been extensive in this area, beginning with clearing for agriculture from the early 19th Century. More recent land uses have included poultry farms (1961 – 1990s), sand mining (1960s to present) and urbanisation (1979 to present) (Clements *et al.* 2002). The land uses of the Spring Farm area were described by Clements *et al.* (2002) as ‘sand extraction, abandoned orchards/vineyards, working and abandoned poultry farms, grazing, unmanaged pastures, rubbish tips and drainage ways; small areas of disturbed native vegetation occur within and fringing these areas’. Since that study, a substantial part of the Spring Farm area has been redeveloped with new housing and roads replacing the previous land uses (Camden Council 2011). The small size and fragmented distribution of the remaining stands of Elderslie Banksia Scrub Forest reduces connectivity between patches, increasing the risk of extinction of taxa in very small stands (Stocklin *et al.* 2000). ‘Clearing of native vegetation’ is listed as a Key Threatening Process under the Act.

3.1.4 Elderslie Banksia Scrub Forest occurs on sandy soils which are subject to nutrient enrichment from surrounding development (G. Steenbeeke *in litt.* Oct 2013), facilitating invasion by exotic weeds (Leishman and Thomson 2005). Weed invasion in Elderslie Banksia Scrub Forest occurred in the past and is continuing (Clements 2002). The following exotic invasive plant species have been observed in remnants of Elderslie Banksia Scrub Forest: *Raphiolepis indica* (Indian Hawthorn), *Lycium ferocissimum* (Boxthorn), *Pyracantha angustifolia* (Firethorn), *Olea europaea* subsp. *cuspidata* (African Olive), *Lantana camara* (Lantana) and *Eragrostis curvula* (African Lovegrass) (P. Cuneo *in litt.* Oct 2013; C. Morris *in litt.* Dec 2013). ‘Invasion of native plant communities by exotic perennial grasses’, ‘Invasion of native plant communities by African Olive *Olea europaea* L. subsp. *cuspidata*’, ‘Invasion, establishment and spread of *Lantana camara*’ and ‘Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants’ are listed as Key Threatening Processes under the Act.

3.2 Criteria for listing

Elderslie Banksia Scrub Forest is eligible to be listed as a Critically Endangered Ecological Community in accordance with Section 12 of the Act as, in the opinion of the Scientific Committee, it is facing an extremely high risk of extinction in New South Wales in the immediate future, as determined in accordance with the following criteria as prescribed by the *Threatened Species Conservation Regulation 2010*:

NSW SCIENTIFIC COMMITTEE

Clause 18 Restricted geographic distribution of the ecological community

The ecological community's geographic distribution is estimated or inferred to be:

- (a) very highly restricted,

and the nature of its distribution makes it likely that the action of a threatening process could cause it to decline or degrade in extent or ecological function over a time span appropriate to the life cycle and habitat characteristics of the ecological community's component species.

Clause 19 Reduction in ecological function of the ecological community

The ecological community has undergone, is observed, estimated, inferred or reasonably suspected to have undergone or is likely to undergo within a time span appropriate to the life cycle and habitat characteristics of its component species:

- (a) a very large reduction in ecological function,

as indicated by any of the following:

- (d) change in community structure,
- (e) change in species composition,
- (f) disruption of ecological processes,
- (g) invasion and establishment of exotic species,
- (h) degradation of habitat.
- (i) fragmentation of habitat.

Professor Michelle Leishman
Chairperson
NSW Scientific Committee

Exhibition period: 20/03/15 – 15/05/15

Proposed Gazettal date: 20/03/15

Part 4. Additional information about the ecological community

The following information is additional to that required to meet the definition of an ecological community under the Act, but is provided to assist in the recognition of Elderslie Banksia Scrub Forest in the field. Given natural variability, along with disturbance history, Elderslie Banksia Scrub Forest may sometimes occur outside the typical range of variation in the features described below.

- 4.1 Elderslie Banksia Scrub Forest is described under the same name in Benson (1977), Benson and Howell (1994), UBBS (1997), Urban Bushland Management Consultants (1998), Clements *et al.* (2002) and Tozer *et al.* (2010).
- 4.2 Elderslie Banksia Scrub Forest is generally associated with alluvium of Tertiary age, on soils which are sandy, with drainage varying from good to poor (Benson 1977). The alluvium occurs on sites that are elevated relative to current river bed, leading to its description as 'high level alluvium' (Benson 1977). Elderslie Banksia Scrub Forest intergrades locally with the endangered ecological communities Cumberland Plain Woodland in the Sydney Basin Bioregion and River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions.

NSW SCIENTIFIC COMMITTEE

- 4.3 The structure of Elderslie Banksia Scrub Forest is generally open-scrub or woodland, or it may occur as remnant trees. Species composition at any site depends on local topography and drainage conditions. In drier areas, *Banksia integrifolia* occurs as the characteristic canopy species, together with *Angophora subvelutina* and *Duboisia myoporoides*; other species include *Brachyloma daphnoides*, *Clerodendrum tomentosum*, *Pteridium esculentum*, *Pimelea linifolia*, *Dillwynia glabberima*, *Ricinocarpos pinifolius*, *Hibbertia diffusa*, *Kunzea ambigua*, *Exocarpos cupressiformis*, *Persoonia linearis* and *Dianella revoluta*. In lower-lying areas with poorer drainage, the canopy changes to *Eucalyptus botryoides* with other species including *Platysace lanceolata*, *Aotus eroicoides*, *Pteridium esculentum* and *Imperata cylindrica*. *Melaleuca decora*, *Gahnia clarkei* and *Gleichenia dicarpa* occur along watercourses (Benson and Howell 1994; reported in Clements *et al.* 2002).
- 4.4 Elderslie Banksia Scrub Forest has been recorded in the Camden local government area (within the Sydney Basin Bioregion), principally near Elderslie in the area known as Spring Farm. However unrecorded stands of the ecological community may occur elsewhere in the Bioregion.
- 4.5 The following threatened fauna have been reported in or adjacent to Elderslie Banksia Scrub Forest (Conacher Travers 2002a, b):

Scientific Name	Common Name	Status
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	Vulnerable (EPBC)
<i>Meridolum corneovirens</i>	Cumberland Land Snail	Endangered
<i>Miniopterus schreibersii oceanensis</i>	Eastern Bentwing Bat	Vulnerable
<i>Mormopterus norfolkensis</i>	Eastern Free-tail Bat	Vulnerable
<i>Pteropus poliocephalus</i>	Grey-headed Flying Fox	Vulnerable (EPBC)
<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	Vulnerable

References:

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NSW SCIENTIFIC COMMITTEE

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- UBBS (1997) *Urban Bushland Biodiversity Survey* (NSW National Park and Wildlife Service: Hurstville).
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