

Nomination to change the conservation class of a species under the Queensland *Nature Conservation Act 1992*

Complete this form to nominate a species for assessment of its conservation class under the *Nature Conservation Act 1992* (NC Act). Any subspecies, variety, race, hybrid, mutation or geographically separate population (hereafter 'species') can be nominated. The appropriate conservation class will be selected during an expert assessment process and, following approval processes, reflected in the next suitable update of the NC Act.

A species may be nominated to an appropriate conservation class from any other conservation class. The nomination assessment process may result in a species being recommended to the conservation class as nominated, or to a class better supported by scientific data and expert opinion. Assessments and nominations will be shared with the Commonwealth and other Australian jurisdictions within the species' distribution.

All plant and vertebrate species native to Queensland are protected under the NC Act and classified as Least Concern unless found eligible for a different conservation class. Invertebrate species are only protected under the NC Act if specifically named under a conservation class. A species can be nominated for listing or reassignment from any conservation class to:

A national threat category:

- Extinct (EX), Extinct in the Wild (EW), Critically Endangered (CR), Endangered (E) or Vulnerable (V) if it meets at least one of the International Union for Conservation of Nature (IUCN) criteria for species at risk of extinction

A state threat class:

- Near Threatened (NT) if the species meets at least one of the criteria for species at risk of becoming threatened in the future based on concerns relating to population dynamics or threats
- Least Concern (LC) if evidence is provided that no criteria for a higher class have been met, and the species won't become eligible for a higher class in the foreseeable future should conservation actions cease due to reclassification.

The assessment of species against the national threat categories reflected in this form complies with the [Memorandum of Understanding](#) for the Common Assessment Method (CAM) between the Commonwealth and Australian states and territories. The objective of the CAM is for partner jurisdictions to adopt each other's national assessments as appropriate. Information about the CAM can be found at <https://www.qld.gov.au/environment/plants-animals/wildlife-permits/common-assessment>.

To nominate a species with an Australian distribution that is not restricted to Queensland, use the nomination form and guidelines at <http://www.environment.gov.au/biodiversity/threatened/nominations/forms-and-guidelines> and email the completed form to the Australian Government at EPBC.nominations@environment.gov.au.

Important notes for completing this form

- **To enable a species eligibility for listing to be assessed against the criteria, please complete the form as comprehensively as possible by providing a response in each box with an orange border.**
- Completing a nomination is a demanding task. Nominators are encouraged to seek advice from experts where appropriate to assist in completing the nomination form.
- The opinion of scientific experts may be cited as personal communication with their approval. Please provide the experts names, qualifications and contact details (including employment in a government agency if relevant) in the reference list at the end of the form.
- Include any available information and analysis or state when the required information is not available.
- Figures, tables and maps can be included at the end of the form or provided as separate electronic files or hardcopy documents (referenced as appendices or attachments in your nomination).
- Cross-reference relevant areas of the nomination form where needed.
- **Reference all information sources**, both in the text and in a reference list at the end of the form.
- Identify confidential material and the reason it is sensitive. With the exception of information you have identified as confidential, nominations under the CAM process may be made available by a state, territory or the Commonwealth Government to experts or the public for comment.
- If the species is listed nationally, the Australian Government will publish nomination information on its website. Your details as nominator will not be released and will be treated as confidential information.
- Guidance on interpreting this nomination form can be found in the “*Guidelines for Assessing the Conservation Status of Native Species*” developed by the Australian Government under the EPBC Act here <http://www.environment.gov.au/biodiversity/threatened/nominations/forms-and-guidelines>. Although not fully relevant under the NC Act, the guidelines provide assistance on several aspects of this form. Please email SpeciesTechnical.Committee@des.qld.gov for further advice on completing the nomination.

Further information on selected questions

INTRODUCTION

Species native to Queensland may be nominated to any conservation class under the NC Act, including to transfer between classes. If the taxon at risk is a population or hybrid, or if you wish to know if it has been unsuccessfully nominated under the NC Act in the past, please contact the Queensland Department of Environment and Science for advice at SpeciesTechnical.Committee@des.qld.gov.au.

To search for a species' conservation class under the NC Act please refer to the *Nature Conservation (Wildlife) Regulation 2006*: <https://www.legislation.qld.gov.au/view/html/inforce/current/sl-2006-0206>.

You can also search the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) list of threatened species in the Species Profile and Threats Database (SPRAT) at www.environment.gov.au/cgi-bin/sprat/public/sprat.pl.

The full lists of threatened fauna and flora under the EPBC Act are available here: www.environment.gov.au/cgi-bin/sprat/public/publicthreatenedlist.pl?wanted=fauna
www.environment.gov.au/cgi-bin/sprat/public/publicthreatenedlist.pl?wanted=flora.

You can find a list of nominated species that did not meet the assessment criteria for listing under the EPBC Act at www.environment.gov.au/biodiversity/threatened/unsuccessful-species.html.

A nomination to transfer a species from a threatened conservation class to Least Concern or Near Threatened under the NC Act need not address sections marked with an asterisk (*).

SCIENTIFIC AND COMMON NAMES OF NOMINATED SPECIES

- Provide the currently accepted scientific and common name(s) for the species (including Indigenous names, where known). Note any other scientific names that have been used recently such as superseded names.

TAXONOMY

- Record the species' authority and the taxonomic group to which it belongs (Family name is sufficient for plants; both Order and Family name are required for fauna).
- Is the species known to hybridise with other species? Describe any cross-breeding with other species in the wild, indicating where and how frequently this occurs.

DISTRIBUTION

- In accordance with the CAM, the Commonwealth is the default assessment 'lead' for species occurring across multiple Australian jurisdictions, and the nomination will be subject to the prioritisation and assessment process under the EPBC Act. Download the nomination form here <http://www.environment.gov.au/system/files/pages/d72dfd1a-f0d8-4699-8d43-5d95bbb02428/files/nomination-form-species.pdf>, and email it to epbc.nominations@environment.gov.au. Further information on the EPBC Act nomination, prioritisation and assessment process is available at <http://www.environment.gov.au/biodiversity/threatened/nominations>.
Note: where the relevant jurisdictions agree, a State or Territory (rather than the Commonwealth) may take the lead on assessing a cross-jurisdictional species, in consultation with the Commonwealth and other jurisdictions.
- A nomination for a species endemic to Queensland or with its only Australian distribution in Queensland, for example a species only occurring in Queensland and Papua New Guinea, can be assessed under the NC Act. Please submit your completed nomination form to SpeciesTechnical.Committee@des.qld.gov.au.
- Describe the species' current geographic distribution within Queensland, and where applicable, outside Australia.
- Provide a map, if available, indicating latitude, longitude, map datum and location names
 - Indicate the percentage of the global population that occurs in Queensland, and what is its significance?
 - Is the Queensland population distinct, geographically isolated, or does part or all of the population migrate into/out of the Queensland jurisdiction?
 - Explain the relationship between the Queensland population and the global population.
 - Do global threats affect the Queensland population?
- Give locations of other existing or proposed populations such as populations that are captive, propagated, naturalised outside their range, recently re-introduced to the wild, and planned to be re-introduced. Note if these sites have been identified in recovery plans. Provide latitude, longitude, map datum and location name, where available, in an attached table.
- Give details of fauna species' home ranges/territories including any relevant daily and seasonal or irregular movement patterns, such as arrival/departure dates if migratory.
- Does the species occur within an EPBC Act listed ecological community? You will find a list of EPBC Act listed ecological communities here: www.environment.gov.au/cgi-bin/sprat/public/publiclookupcommunities.pl.

BIOLOGY/ECOLOGY

- **Life cycle:** Provide detail on the age at sexual maturity, average life expectancy, natural mortality rates, and generation length
 - “*Generation length*” is defined as the average age of parents of the current cohort (i.e. newborn individuals in the population), and reflects the turnover rate of breeding individuals in a population. Generation length is greater than the age at first breeding and less than the age of the oldest breeding individual, except in species that breed only once. Where generation length varies under threat, use the more natural pre-disturbance generation length. It is often calculated as = (longevity + age at maturity)/2. Provide details of the method(s) used to calculate the generation length.
- **Reproduction:** Provide detail on the reproductive requirements of this species.
 - **Flora:** When does the species flower and set fruit? What conditions are needed for this? What are the pollinating and seed dispersal mechanisms? If the species reproduces vegetatively, describe when, how and what conditions are needed. Does the species require a disturbance regime (e.g. fire, cleared ground) to reproduce?
 - **Fauna:** provide an overview of the species' breeding system and breeding success, including: when it breeds; what conditions are needed for breeding; whether there are any breeding behaviours that may make it vulnerable to a threatening process.
- **Habitat**
 - Provide information on aspect, topography, substrate, climate, forest type, associated species, sympatric species and anything else that is relevant to the species' habitat.
 - Explain how habitats are used (e.g. breeding, feeding, roosting, dispersing, basking, etc.).
 - Does the species use refuge habitat (e.g. in times of fire, drought or flood)? Describe this habitat.
- **Feeding (fauna):**

- Summarise the feeding behaviours, diet, and the timing/seasonality associated with these. Include any behaviour that may make the species vulnerable to a threatening process.
- **Movement (fauna):** provide information on daily and seasonal movement patterns.

IDENTIFICATION OF KNOWN THREATS AND IMPACTS OF THE THREATS

- For each threat, describe:
 - a. whether it is actual or potential
 - b. how and where it impacts on this species
 - c. what its effect has been so far (is the threat known or suspected?, does it only affect certain populations?) Present supporting information/research).
 - d. its expected effect in the future (is the threat known or suspected?, does it only affect certain populations?, is there supporting research/information?) Present supporting information/research).
 - e. its relative importance or the magnitude of the impact on the species.
- Identify and explain any additional biological characteristics particular to the species that are threatening to its survival (e.g. low genetic diversity).
- If subject to natural catastrophic events, i.e. events with a low predictability that are likely to severely affect the species, identify the type of event, its likely impact, and its likelihood of occurrence (e.g. a drought/cyclone in the area every 100 years). If **climate change** is an important threat to the species, provide referenced information on how climate change might significantly increase the species' vulnerability to extinction. Please refer to the *Guidelines for Assessing the Conservation Status of Native Species*:
<http://www.environment.gov.au/system/files/pages/d72dfd1a-f0d8-4699-8d43-5d95bbb02428/files/tssc-guidelines-assessing-species-2018.pdf>.

*CONSERVATION ADVICE: THREAT ABATEMENT AND RECOVERY ACTIONS

- Describe how threats are or could be abated and/or species recovered.
- Identify who is undertaking these activities and how successful the activities have been to date.
- Describe any mitigation measures or approaches that have been developed specifically for the species at identified locations. Identify who is undertaking these activities and how successful the activities have been to date.
- For species nominated as Extinct in the Wild, provide location details for any naturalised or captive populations and the level of human intervention required to sustain the species.

IMPACT OF TRANSFERRING A THREATENED SPECIES TO NEAR THREATENED OR LEAST CONCERN

- Only complete this section if you are nominating a species for transfer to Near Threatened or Least Concern from a class of nationally threatened wildlife (Extinct, Extinct in the Wild, Critically Endangered, Endangered or Vulnerable).
- Provide details of the expected impact on the species if conservation actions ceased following its transfer out of a threatened wildlife class.

CURRENT LISTING CLASS AND CATEGORY

- Note: The term 'class' under the NC Act is equivalent to the term 'category' under the EPBC Act.
- Select the species' current class under the NC Act where applicable. Search the species' NC Act class here: <https://www.legislation.qld.gov.au/view/html/inforce/current/sl-2006-0206>.
- Select the species' current category under the EPBC Act where applicable. Search the Australian Government SPRAT Database here: www.environment.gov.au/cgi-bin/sprat/public/sprat.pl.

NOMINATED LISTING CLASS

- **After completing the section 'Eligibility against the criteria'** sufficient evidence should be available to determine your response to this section. Please select the NC Act class to which the species is being nominated.

REASONS FOR A NOMINATION TO TRANSFER TO ANOTHER CLASS

Please describe why the species is being nominated to transfer to another conservation class in Queensland:

- *Genuine.* The change in class is the result of a genuine status change that has taken place since the previous assessment. For example, the change is due to an increase in the rate of decline, a decrease in population or range size or habitat, or declines in these for the first time (owing to increasing/new threats).
- *Knowledge.* The change in class is the result of new knowledge, e.g. owing to new or newly synthesised information about the status of the taxon (e.g. better estimates for population size, range size or rate of decline).
- *Taxonomy.* The change in class is due to a taxonomic change adopted during the period since the previous assessment. Such changes include:

- *newly split* (the taxon is newly elevated to species level)
- *newly described* (the taxon is newly described as a species)
- *newly lumped* (the taxon is recognised following lumping of two previously recognised taxa)
- *no longer valid/recognised* (either the taxon is no longer valid, e.g. because it is now considered to be a hybrid, variant form or subspecies of another species, or the previously recognised taxon differs from a currently recognised one as a result of a split or lump).
- *Mistake*. The previous class was applied in error.
- *Other*. The change in class is the result of other reasons not easily covered by the above, and/or requires further explanation. Examples include change in assessor's attitude to risk and uncertainty.

INITIAL LISTING

- The reasons for the initial NC Act listing may be available in the original nomination for the species. This can be obtained by emailing the Department of Environment and Science's Species Technical Committee at SpeciesTechnical.Committee@des.qld.gov.au.
- The reasons for EPBC Act listing may also be available. Search for the species' EPBC Act listing and conservation advice for threatened species in the SPRAT Database www.environment.gov.au/cgi-bin/sprat/public/sprat.pl.
- If there is insufficient information to provide details of the reasons for the original listing, please state this.

CHANGES IN SITUATION LEADING TO THE NOMINATION TO TRANSFER TO ANOTHER CLASS

- Describe the changes that have occurred or are likely to occur to the species' population, range or habitat that influence the nomination to change the species' conservation class.

ELIGIBILITY AGAINST CRITERIA

- For a species to be eligible as Near Threatened or a class of threatened wildlife, it must be assessed as meeting **at least one** of the five 'criteria' on this nomination form. For example, for a species listed as Vulnerable to be transferred to the Endangered class, it must meet the threshold/s for at least one of the five criteria for Endangered.
- A species does not have to be found eligible for the same class under all criteria; however, all questions must be answered. If information is not available for a particular criterion, a statement to this effect is required.
- If you hold unpublished data that support assessment of a criterion, you must provide them with the nomination.
- Standards for assessing a species' conservation status in Australia align with the IUCN Red List Criteria and Categories. Please refer to the IUCN guidelines for explanations of how to address the criteria <http://s3.amazonaws.com/iucnredlist-newcms/staging/public/attachments/3151/redlistguidelines.pdf>.

DECLARATION

In signing this nomination form, you agree to grant the Queensland Government (as represented by the Department of Environment and Science) a perpetual, non-exclusive, worldwide, royalty-free licence to use, reproduce, publish, communicate and distribute information that you have provided in the nomination form that is not referenced to other sources with the exception of information specifically identified by you as confidential, in websites and publications and to promote those websites and publications in any medium.

As nominator, your details are automatically subject to the provisions of the *Privacy Act 1988* and will not be divulged to third parties. The Commonwealth, State and Territory governments have agreed to collaborate on national threatened species assessments using the CAM. As part of this collaboration, your nomination, including your details as nominator, may be provided to other government jurisdictions, who will also observe these privacy and confidentiality arrangements.

If you subsequently agree to be cited as the author of specific, cited information, you will be acknowledged in all publications and websites in which that information appears, in a manner consistent with the *Style Manual for Authors, Editors and Printers* (latest edition).

Nomination form to change the conservation class of a species in Queensland

Details of the nominated species

SCIENTIFIC NAME OF SPECIES (SUBSPECIES, VARIETY, ETC. TO BE SPECIFIED WHERE RELEVANT)

Grevillea scortechinii subsp. *scortechinii*

COMMON NAME(S)

Black Grevillea

TAXONOMY

Provide any relevant detail on the species' taxonomy (e.g. authors of taxon or naming authority, year and reference; synonyms; Family and Order).

Grevillea scortechinii (F.Muell. ex Scort.) F.Muell. subsp. *scortechinii*. Published in McGillivray (1986); full taxonomic context in McGillivray & Makinson (1993).

Synonym: *Grevillea ilicifolia* var. *scortechinii* F.Muell. ex Scort. Published in Scortechini (1883).

Family Proteaceae, Order Proteales

*CONVENTIONAL ACCEPTANCE OF TAXONOMY

Is the species' taxonomy conventionally accepted?

Yes

No

If the species is not conventionally accepted, please provide the following information:

- a taxonomic description of the species in a form suitable for publication in conventional scientific literature

OR

- evidence that a scientific institution has a specimen of the species, and a written statement signed by a person who is a taxonomist and has relevant expertise (has worked with, or is a published author on, the group of species nominated) that the species is considered to be a new species.

[Click or tap here to enter text.](#)

*DESCRIPTION

Provide a description of the species. Include where relevant its distinguishing features, size and social structure.

How distinct is this species in its appearance from other species? How likely is it to be misidentified?

This description comes from Makinson (2000).

Species description: Prostrate to sprawling shrub to 0.8 m tall and 1.2 m* across. Leaves angular-ovate to oblong, 3–11 cm long, 20–60 mm wide, serrato-dentate to pinnatifid or rarely entire, usually with 3–14 lobes or marginal teeth, these sometimes again 2- or 3-dentate; ultimate lobes rounded, broadly subtriangular, to 2 cm long, often pungent; margins slightly recurved; lower surface sericeous. Unit confluence erect to decurved, secund; floral rachis 20–45 mm long. Perianth subsericeous outside. Flower colour: perianth brownish; style dark purplish black; pollen-presenter green. Pistil 19–30 mm long; stipe 1–2.6 mm long; style glabrous. Follicle 8.5–12 mm long, subsericeous.

*Dodd (1991) reported plants up to 2.5 m wide (at Location 4). The largest recorded in 2019 were about 1.5 m (SRWC 2019).

Distinguishing it from *G. scortechinii* subsp. *sarmentosa*: Leaves with lobes usually simple (often 2- or 3-toothed in *sarmentosa*); venation of upper (adaxial) surface prominent (not conspicuous in *sarmentosa*). Pistil 28–30 mm long (19–22 mm long in *sarmentosa*); stipe 2.0–2.6 mm long (1.0–1.6 mm long in *sarmentosa*).

DISTRIBUTION

Provide a succinct overview of the species' known or estimated current and past distribution, including international/national distribution. Provide a map if available.

Is the species' habitat protected within the reserve system (e.g. national parks, Indigenous Protected Areas, or other conservation estates, private land covenants, etc.)? If so, which populations? Which reserves are actively managed for this species? To your knowledge, which reserves are being actively managed in way that provides incidental benefits for this species? Give details.

Black *Grevillea* has a very restricted distribution on the Stanthorpe Plateau in southern Queensland.

Current distribution: The distribution of black grevillea extends north to south about 13 km and east to west about 6 km; its extent of occurrence is about 22 km². It is currently known from 12 small sites in two disjunct areas: the northern sites at Thulimbah, Cottonvale and The Summit are separated by >10 km from the southern sites at Applethorpe and Dalcouth.

The sites have been grouped into four 'locations' based on location and tenure. Tenure is the main determinant of site characteristics such as shape, vegetation structure and grevillea density as well as threats and recovery prospects. The northern sites occur mainly on road reserves (L1) and also on a rail reserve (L2) and private property (L3). The southern sites all occur on private property (L4).

Former distribution: There are records for 14 additional sites at which black grevillea no longer occurs that extend the known distribution much further north, west and east, and increase the extent of occurrence more than five-fold to 120 km².

Reserves: No black grevillea plants are protected within the reserve system. They occur on road and rail reserves (77% of the mature plants counted in 2019) and private land. There is no conservation management of any sites, which is evident in the weediness of most sites.

BIOLOGY/ECOLOGY

Provide a summary of biological and ecological information.

Include information on:

- life cycle including age at sexual maturity, life expectancy and natural mortality rates
- specific biological characteristics
- the species' habitat requirements
- for fauna: feeding behaviour and food preference and daily/seasonal movement patterns
- for flora: pollination and seed dispersal patterns

Life cycle: Little is known. Black *Grevillea* flowers annually from September to January (SRWC 2018) and fruits from December to January (Donatiu 2006). The species reproduces by seed. Vegetative reproduction by rhizomes has not been recorded, although it has at least some capacity to resprout from crown rootstock or stem bases after low-intensity fire (Donatiu 2006, see below). The species is moderately fecund; fruit and seed set rates are high relative to some allied species, although absolute data are lacking (RO [Bob] Makinson pers comm, 4 August 2019). The plant's ability to germinate in response to disturbance (see below) suggests that a moderately plentiful and perhaps long-lived soil seed bank may accumulate, and may be stimulated to germinate by simple mechanical disturbance (possibly with other triggers related to age, temperature or moisture), but no data are available on seed longevity or dormancy/germination mechanisms.

Black *Grevillea* is likely to attain a 'considerable age' of at least 30 years and up to 60 to 70 years (RO Makinson, pers comm, 9 June 2019). Natural rates of mortality are unknown. Surveys in 2019 found recently dead plants equivalent to 3% of the number of mature live individuals, but these were not evenly distributed among sites (at one site, the number of dead was equivalent to 20% of the live population), suggesting the deaths were not all due to natural factors.

Habitat: Black *Grevillea* occurs in granitic, sandy-loamy soils in sclerophyll woodland (Makinson 2000), on well-drained flats and lower slopes (Dodd 1991). Current populations in natural settings occur in association with regional ecosystems 13.12.1, 13.12.2 and 13.12.9 (Holmes & Holmes 2008). However, the majority of plants (>90% of those surveyed in 2019) now occur in highly disturbed cleared areas: along roadsides and railroads, and on and around dam walls and drains.

Pollination and seed dispersal: Black *Grevillea* is thought to be bird-pollinated, but no observations have been recorded. The location of most flowers at ground level may limit the number of visiting birds. Based on observations on related plants elsewhere, seven bird species on the Granite Belt are potential pollinators. The eastern spinebill and red wattlebird have been observed feeding on a prostrate mat-forming shrub in Victoria, *Grevillea repens* (Holmes et al 2008), and the red wattlebird, New Holland honeyeater, spiny-cheeked honeyeater, yellow-tufted honeyeater and brown-headed honeyeater have been recorded feeding on

G. illicifolia (closely related to black grevillea) (Paton & Ford 1977). Noisy miners are also likely to visit ground-level nectar sources (the closely related yellow-throated miner was recorded on *G. illicifolia*). Most closely related grevilleas are thought to be capable of bird-mediated self-pollination as well as outcrossing, although fecundity and fitness may be higher via non-self-mating (Bob Makinson pers comm, 4 August 2019). As is the case for other grevilleas, ants are thought to be the agents of seed dispersal for black grevillea.

Disturbance: Black Grevillea is an opportunist awaiting soil disturbance for germination (Holmes & Holmes 2008). A landowner at Applethorpe reported that when an inflow ditch was constructed to a small dam, many black grevilleas germinated almost simultaneously with the onset of spring (G Meredith, Torwood, cited by Holmes & Holmes 2008). One of the most important sites for black grevillea is an area next to a dam scraped in the early 2000s, where numbers have increased by 50% over the past 10 years. In 2019, some juveniles were growing on recently disturbed areas above a road drain. However, disturbance also favours weeds that compete with black grevillea.

Fire: Clarke and Knox (2002) infer that black grevillea is an obligate seeder due to its morphology and the responses of sister taxa. The other subspecies, *Grevillea scortechinii* subsp. *sarmentosa*, germinated en masse after fires in Warra National Park, NSW (Hunter 2005). However, black grevillea can resprout after low-intensity fire. This was observed after a roadside fire on Thulimbah School Road (Donatiu 2006).

Threats

IDENTIFICATION OF KNOWN THREATS AND IMPACT OF THE THREATS

Identify any known threats to the species in the table below. Describe **past, current or future** threats, whether the threats are **actual or potential**, and the **type and level of impact** you believe each threat is having on the species.

Past threats	Impact of threat
Habitat destruction & modification	<p>Of the 14 sites where black grevillea has become locally extinct, nine may have been due to clearing for horticulture, stock grazing or railway works. In addition, Dodd (1991) noted the clearing of black grevilleas in an orchard adjacent to the most populous site on Thulimbah School Road (site L1/S3) and the grading of roadside populations (site L1/S5), at least some of which were recolonised. One recent egregious example is Queensland Rail destroying the northernmost population by grading a track next to a railway.</p> <p>The current highly fragmented distribution of black grevillea and its restriction mainly to roadsides and rail reserves indicate a major loss of habitat. This is likely to have occurred in part due to clearing on private properties, roadside grading and mowing, and railway works.</p>
Increased density of forest habitats	<p>Although forested sites accounted for 38% of the 2019 occupied habitat area, fewer than 5% of black grevilleas currently occur in these sites (L3/S1, L4/S2–S4) (SRWC 2019). Those proportions have decreased since 2008 from 69% of the occupied habitat area and 27% of the population size (Holmes & Holmes 2008). Over the past 60 years, the majority of local extinctions have also occurred in forested sites on private land, 4 of which are still forested (L3/S2, L3/S3, L3/S6 L4/S6). These losses and declines are likely to have occurred in part due to degradation of sites (e.g. from stock grazing) but also due to forest regrowth and thickening that result in black grevilleas being shaded out and outcompeted. Historical aerial photos show that forest densities have been increasing in and around several black grevillea sites over the past few decades.</p> <p>Lack of fire is contributing to this threatening process. Dodd (1991) reported ‘many large’ black grevilleas at site L3/S1 (on private land adjoining the largest grevillea population at site L1/S3). At the time this site was reportedly burned every 10 years or so and the vegetation was much more open than it is now. Grevilleas occur now only along the boundary with the road reserve, their occupied habitat area having declined by at least 90% since 1991.</p> <p>A lack of fire has also contributed to the decline of black grevilleas at site L2/S1 (the Cottonvale rail reserve), with the vegetation structure in transition from grassland with a few scattered shrubs (Dodd 1991) to a more forest-like structure with invasive pines, eucalypts, and native and exotic shrubs. Most of the black grevilleas occur in a small still-open patch. The grassland had been maintained by regular burning by rail managers (Dodd 1991).</p>

	<p>Pine invasion and forest thickening have probably been the main causes of the location extinction at site L3/S2. Dodd (1991) reported a conversation with the landholder, who recalled there being a 'considerable number' of grevilleas 60 years prior (in the 1930s). There were just two plants recorded in 2008 and none in 2019. By 1991, the properties were being invaded by <i>Pinus radiata</i> and had a 'quite dense' lower stratum of native shrubs (<i>Leptospermum</i>, <i>Bossiaea</i>, <i>Pultenaea</i>, <i>Boronia</i>, <i>Hakea</i>, <i>Mirbelia</i> and many others). Dodd (1991) concluded that black grevillea had been excluded from the forest by increased competition. Historical aerial photos show that most of the forest north of Pozieres Road is denser now than it has been over the past several decades.</p> <p>It is not known what the pre-European analogues were to the open disturbed habitat now preferred by black grevilleas. Perhaps a more open forest structure maintained by mosaic burning practices by traditional owners suited this taxon.</p>
Current threats	Impact of threat
Weed invasion	<p>Weed invasion is a major threat in almost all sites, particularly on the road and rail reserves, including from pine (<i>Pinus radiata</i>), blackberry (<i>Rubus anglocandicans</i>), African lovegrass (<i>Eragrostis curvula</i>), honeysuckle (<i>Lonicera japonica</i>) and whisky grass (<i>Andropogon virginicus</i>). The weeds are smothering and shading black grevillea plants, competing for space and resources and increasing the flammability of black grevillea habitats.</p> <p>As discussed above, competition with native shrubs and trees is also a threat, particularly in forested areas, all of which are becoming denser.</p>
Habitat destruction & modification	<p>Habitat destruction and modification have occurred along road and rail reserves through maintenance activities (grading, slashing and, possibly, herbicide spraying; line maintenance by Ergon and/or Telstra has also resulted in tree and shrub debris covering the plants beneath). The northernmost population of black grevilleas, on a rail reserve, with 80 plants recorded in 2008, was destroyed in 2012 due to grading (Jenny Holmes, pers comm, May 2019). (<i>Boronia repanda</i> plants, listed as Endangered, were also destroyed.) Roadside slashing that occurred soon after the 2019 surveys damaged or killed some plants in sites L1/S1 and L1/S3, although slashing may also benefit black grevillea by reducing competition from other plants. Habitat destruction is also a threat at Location 4, with most of this population occurring on a horticultural farm near a road and dam used for farming. At full dam capacity, it is likely that some plants would be submerged. Horse grazing has also modified habitats and may have contributed to local extinctions at L4/S6 and next to L3/S1.</p>
Future threats – actual	Impact of threat
Weed invasion	<p>Unless there is active management, it is inevitable that weed invasion will continue to reduce the population and area of occupancy of the black grevillea in almost all sites. In the few places where weeds are not competing with black grevillea – in natural forest – competition with native trees and shrubs is a threat as indicated by the very low and declining densities of black grevillea in these sites.</p>
Habitat destruction & modification	<p>All sites are at risk of future habitat destruction due to road or rail works, grading, herbicide spraying, mowing or slashing. Most of the plants on private land occur around dams, some of which could be subject to modification in future (e.g. to deepen the dams or modify drainage). Horses could be a threat in future if they are introduced into privately owned sites. They are likely to have contributed to local extinctions at L4/S6 and next to L3/S1.</p>
Future threats – potential	Impact of threat
Disease	<p>In a few sites – particularly on the rail reserve (L2/S1) and one of the private land sites at Applethorpe (L3/S1) – several black grevilleas appeared stressed/unhealthy and there had been recent deaths (although whether this was due to disease is unknown). The number of dead plants at site L2/S1 (11) was equivalent to 21% of the live population and those at site L3/S1 (12) were equivalent to 25% of the live population. Dodd (1991) also observed that many of</p>

	the plants on the rail reserve site were unhealthy, with widespread chlorosis, leaf miner attack and death. A fungal leaf spot (<i>Pestalotiopsis</i> sp.) was well entrenched. Disease could become a more serious threat in future if genetic diversity declines and as the climate changes.
Stochastic effects	Due to extreme fragmentation and the resulting small numbers in disjunct sites, many subpopulations have probably been lost due to genetic, demographic or environmental stochastic processes, such as inbreeding, lack of pollination or disease. Two sites in 2008, which had fewer than five plants each, had none in 2019. In 2019, three sites had fewer than 20 plants and eight sites (75% of all sites) had fewer than or just over 50 plants.

***CONSERVATION ADVICE: THREAT ABATEMENT AND RECOVERY ACTIONS**

Give an overview of recovery and threat abatement/mitigation actions that are underway, have been formally proposed or that you would like to recommend. Address all threats listed or state threats that lack conservation advice.

Current threats	Abatement or recovery action underway
Competition from weeds and native trees and shrubs	No abatement or recovery actions are occurring. This threat is growing.
Habitat destruction & modification	Conservation signs have been erected in road and rail reserves but these have failed to stop the destruction of plants, including the complete destruction of one subpopulation of black grevillea in a rail reserve in 2012 (site L2/S2) and the loss of plants in a road reserve at site L5/S1 since 2006 (from causes unknown). Private landowners have mostly been unaware of the species and its significance. Their future intentions for the sites with black grevillea are unknown. Future access to the sites on private land for monitoring is not guaranteed, so destruction could occur without anyone noticing for a long time.
	Abatement or recovery action proposed
Competition from weeds and native trees and shrubs	The recommended actions in the Commonwealth threatened Species Scientific Committee's 2008 Conservation Advice (TSSC 2008) are to identify and remove weeds, ensure chemicals or other mechanisms used to eradicate weeds do not have a significant adverse impact, and manage sites to prevent introduction of weeds. We recommend a concerted weed management effort (by hand not spraying) to remove weeds competing with black grevillea, particularly in the road and rail reserves. Research on appropriate fire regimes is needed to determine how best to reduce competition from weeds and native plants. However, it is unlikely to be feasible to undertake prescribed burning on private lands.
Habitat destruction & modification	The recommended actions in the federal conservation advice (TSSC 2008) include monitoring to identify key threats and the progress of recovery, identification of populations of high conservation priority, ensuring road widening and maintenance activities do not adversely impact known populations, minimising adverse impacts from land use, controlling access routes to constrain public access to known sites on public land (this is not practical) and investigating formal conservation arrangements such as the use of covenants. We recommend the development of a management agreement with the local government and railroad managers specifying the actions necessary to protect existing populations. The landholder with the largest population on private land could be approached to discuss likely future uses of the main black grevillea site and a management agreement to protect it. Research is needed on the impacts of disturbance and fire as the basis for developing management recommendations. It may be feasible to extend some habitats by disturbance (e.g. grading) or fire. This should be tested. A high priority should be the propagation of black grevillea for the purpose of rehabilitating sites. If propagation is feasible, it would make an attractive garden plant.

Future threats – actual	Abatement or recovery action underway
Habitat destruction & modification	None
Weed invasion	None
Abatement or recovery action proposed	
Habitat destruction & modification	See above under current threats.
Weed invasion	See above under current threats.
Future threats – potential	Abatement or recovery action underway
Disease	None
Stochastic events	None
Abatement or recovery action proposed	
Disease	This has not been addressed in the approved conservation advice. We recommend an investigation by a pathologist into the diseases or conditions affecting black grevillea, particularly at site L2/S1 as a basis for determining recovery actions.
Stochastic effects	Basic research into the taxon is needed to determine its pollinators and seed dispersers and the potential for restoring genetic flow between sites. Several sites that are highly vulnerable due to low numbers or a small occupied habitat area should be targeted for rehabilitation should propagation prove feasible.

IMPACT OF TRANSFERRING A THREATENED SPECIES TO NEAR THREATENED OR LEAST CONCERN

Omit this section and proceed to 'Listing class/category' if the nomination does not involve transferring a species from a threatened class to Least Concern or Near Threatened.

If the threatened species (Extinct, Extinct in the Wild, Critically Endangered, Endangered or Vulnerable) were moved to Least Concern or Near Threatened, what would be the impact if conservation actions for the species were reduced or ceased? Would the species decline at such a rate that it would be eligible for listing under a threatened class again in the foreseeable future? Provide evidence, expert advice and appropriate references to support your response.

Conservation action	Impact on the species if abatement/recovery action is reduced or ceases
Click or tap here to enter text.	Click or tap here to enter text.
Click or tap here to enter text.	Click or tap here to enter text.
Click or tap here to enter text.	Click or tap here to enter text.

Listing class/category

CURRENT LISTING CLASS/CATEGORY

[Please mark the boxes that apply by double clicking them with your mouse.]

In what class is the species currently found under the **NC Act**?

<input type="checkbox"/> Extinct	<input type="checkbox"/> Extinct in the Wild	<input type="checkbox"/> Critically Endangered	<input type="checkbox"/> Endangered
<input checked="" type="checkbox"/> Vulnerable	<input type="checkbox"/> Near Threatened	<input type="checkbox"/> Least Concern	<input type="checkbox"/> Not listed

In what category is the species currently listed under the **EPBC Act**?

<input type="checkbox"/> Extinct	<input type="checkbox"/> Extinct in the Wild	<input type="checkbox"/> Critically Endangered	<input type="checkbox"/> Endangered
<input checked="" type="checkbox"/> Vulnerable	<input type="checkbox"/> Conservation Dependent		<input type="checkbox"/> Not listed

NOMINATED LISTING CLASS

To what class under the **NC Act** is the species being nominated?

<input type="checkbox"/> Extinct	<input type="checkbox"/> Extinct in the Wild	<input checked="" type="checkbox"/> Critically Endangered	<input type="checkbox"/> Endangered
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Vulnerable Near Threatened Least Concern Not listed

Nominating a species to transfer to another class

REASON FOR A NOMINATION TO TRANSFER TO ANOTHER CLASS

What is the reason for the nomination?

Genuine change of status New knowledge Mistake Other
 Taxonomic change - 'split' newly described 'lumped' no longer valid

INITIAL LISTING

Describe the reasons for the species' initial listing under the NC Act and/or the EPBC Act and, if available, the criteria under which it was formerly considered eligible.

The reasons for the original listing under Schedule 1 of the *Endangered Species Protection Act 1992* (Cwlth) are not specified in any public document.

CHANGES IN SITUATION LEADING TO THE NOMINATION TO TRANSFER TO ANOTHER CLASS

Please complete (a), (b) OR (c) as appropriate to the nomination.

(a) Critically Endangered, Endangered, Vulnerable or Near Threatened

Describe the change in circumstances that make the species eligible for listing in a class other than Extinct and Extinct in the Wild.

Since the original listing of black grevillea, surveys have been conducted (in 2008 and 2019) that clarify its occurrence and population size, and show that the extent of occurrence, area of occupancy, occupied habitat areas and the size of some subpopulations have declined. The major threats have not been abated.

(b) Extinct in the Wild

A native species is eligible to be included in the Extinct in the Wild class if: (a) thorough searches have been conducted for the species; and (b) the species has not been seen in the wild over a period appropriate for its life cycle or form. The species may still survive in cultivation, captivity or as a naturalised population (or populations) well outside the historic range.

Describe how circumstances have changed that now make the species eligible for listing as Extinct in the Wild. Provide details of the last valid record or observation of the species in the wild.

Click or tap here to enter text.

(c) Extinct

A native species is eligible to be included in the Extinct class if there is no reasonable doubt that the last member of the species has died. A taxon is presumed Extinct when exhaustive surveys in the known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual.

Describe how circumstances have changed that now make the species eligible for listing as Extinct. Provide details of the last valid record or observation for the species in the wild and captivity.

Click or tap here to enter text.

Eligibility against the criteria

Standard of scientific evidence and adequacy of survey

For this assessment it is considered that the survey of the species has been adequate and there is sufficient scientific evidence to support the listing outcome.

CRITERION A

Population size reduction (reduction in total numbers) measured over the longer of 10 years or 3 generations based on any of A1 to A4

	Critically Endangered (CR)	Endangered (EN)	Vulnerable (VU)	Near Threatened (NT)
A1	≥ 90%	≥ 70%	≥ 50%	≥ 20%
A2, A3, A4	≥ 80%	≥ 50%	≥ 30%	≥ 20%

A1	Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.	<i>based on any of (a) to (e)</i>	(a)	direct observation [<i>except A3</i>]
A2	Population reduction observed, estimated, inferred or suspected in the past where the causes of the reduction may not have ceased OR may not be understood OR may not be reversible.		(b)	an index of abundance appropriate to the taxon
A3	Population reduction, projected or suspected to be met in the future (up to a maximum of 100 years) [(a) <i>cannot be used for A3</i>]		(c)	a decline in area of occupancy, extent of occurrence and/or quality of habitat
A4	An observed, estimated, inferred, projected or suspected population reduction where the time period must include both the past and the future (up to a max. of 100 years in future), and where the causes of reduction may not have ceased OR may not be understood OR may not be reversible.		(d)	actual or potential levels of exploitation
			(e)	the effects of introduced taxa, hybridisation, pathogens, pollutants, competitors or parasites

Please identify whether the species meets A1, A2, A3 or A4. Include an explanation, supported by data and information, on how the species meets the criterion (A1 – A4). If available include information on:

- whether the population trend is increasing, decreasing or static
- estimated generation length and method used to estimate the generation length

You must provide a response. If there is no evidence to demonstrate a population size reduction, this **must be** stated.

Black Grevillea meets criterion A2(c) for Endangered based on an *inferred* population decline, as indicated by a reduction in *area of occupancy, extent of occurrence and quality of habitat* of >50% over three generations.

Based on other grevillea species and an inferred longevity of 60–70 years, grevillea expert Bob Makinson (pers comm, 9 June 2019) estimates a generation length of 10–30 years. Therefore, we assume here that three generations equate to a minimum of 30 years and a maximum of 90 years, although we focus on a maximum period of 60 years due to a lack of records prior to that.

Extent of occurrence (EOO)

10-year decline: there has been an 18% decline in EOO since 2009 due mainly to the loss of the northernmost site, site L2/S2 on a rail reserve, which was graded by Queensland Rail in 2012 (Jenny Holmes, pers comm May 2019).

30-year decline: there has been a 69% decline in EOO since 1989 due to the loss of two sites west of the current sites (L1/S7 & L1/S8, both on road reserves) as well as the northernmost site noted above (L2/S2). Note: the original sources of the two road reserve records are unknown.

60-year decline: there has been a 69% decline in EOO since 1959 due mainly to the loss of four sites west of the current sites (L1/S7 & L1/S8 on road reserves; L3/S6 & L3/S7 on freehold land), two sites east of current sites (L3/S4 & L3/S5 on freehold land) and one site north (L2/S2)

Area of occupancy (AOO)

10-year decline: there has been a 17% decline in AOO since 2009 due to the loss of a site from one grid (L2/S2 on a rail reserve).

30-year decline: there has been a 44% decline in AOO since 1989 due to the loss of sites from three grids (L1/S7 & L1/S8 on road reserves; L3/S3 on freehold land).

60-year decline: there has been a 55% decline in AOO since 1959 due to the loss of sites from six grids (L1/S7 & L1/S8 on road reserves; L3/S4, L3/S5, L3/S6 & L3/S7 on freehold land).

Quality of habitat

We assume in the following estimates that declines in ‘occupied habitat area’ (OHA) represent declines in the quality of habitat. There are unlikely to be habitat areas that are not occupied, except perhaps at one site (L4/S1), due to grading creating a new area for colonisation, although it is likely to have been a habitat area

prior to grading. As discussed in the threats section, the declines in habitat quality are mainly due to weed invasion, increased vegetation density, and habitat destruction.

10-year decline: surveys in 2008 and 2019 found that the OHA had declined by 20%. The OHA declined by >10% at seven sites, increased by >10% at one site, and was stable at seven sites (<10% change). The increase was near a dam where an area had been scraped in the early 2000s, creating a new area for colonisation (site L3/S1). The largest OHA losses occurred in: (a) a rail reserve, with the complete destruction of site L2/S2; (b) on freehold land in a forested area, probably due to the loss of sparsely distributed plants as the forest thickened (site L4/S5); and (c) on a roadside verge (site L1/S5), possibly due to weed invasion and roadside modification. The OHA changes are mostly reflected in changes in population sizes at each site, with declines at nine sites and increases at four sites. The main increase in numbers was recorded at the most populous site (site L1/S3) – a 90% increase despite the OHA staying the same – which led to an overall increase in the population of black grevillea by 19% since 2008. The numbers may have been suppressed in 2008 due to recent fire (noted by Donatiu 2006) and mowing (noted by Holmes & Holmes 2008).

30-year decline: there has been an estimated 57% decline in OHA since 1989, mainly due to declining habitat quality.

Since 1989, nine sites, 40% of recorded sites, have been completely lost – four on road reserves, one on a rail reserve and four on private property – an estimated decline in OHA of 13,400 m². Where there is no information about OHA, we have assumed that lost sites had an OHA equivalent to the median OHA of current sites. This is a highly conservative assumption given the OHA declines over the past 10 years for most sites. There is also evidence for, or reason to suspect, OHA decline in seven still-existing sites – by an estimated 54,300 m². Taking into account the increased OHA at site L4/S1 since 2008, the OHA has declined by an estimated 44,000 m², 57%, over the past 30 years.

This is a conservative estimate given the likely far larger occurrence of black grevillea on freehold land that was never documented. Aerial photos show a consistent trend over the past few decades of increased forest density on freehold land that has presumably reduced the quality of habitat over a much larger area than recorded. Dodd (1991) describes the Applethorpe forest sites (L4/S2–S4) as having grevilleas ‘scattered over a wide area’ and counted 74 over an area of 120 m² (for bud studies) whereas there are now just over 100 plants in three fragmented forest sites over an area of 12,700 m².

60-year decline: there has been an estimated 61% decline in OHA since 1959, mainly due to declining habitat quality. A total of 13 black grevillea sites have been lost, four in addition to those recorded since 1989, all on freehold land. There are only eight useful records (by five collectors) between 1959 and 1989, so the number of unrecorded sites is likely to be high.

Conclusion

Based on the >50% decline in EOO (over 30 years), AOO (over 60 years) and habitat quality (OHA) (over 30 years) summarised in the following table, in combination with the fragmentation, very high threat levels, small patch sizes, and low plant numbers at current sites, it is reasonable to infer a population decline over 30 years (the minimum estimated three-generation time) of at least 50%. The causes of decline in some cases are: known and irreversible (land clearing or degradation); known and potentially reversible (weed invasion); suspected and probably irreversible (increased forest density on private land due to regrowth/thickening and pine invasion); and are unknown in other areas (see the Threats section).

Time period	EOO decline	AOO decline	OHA decline
10 years (since 2008)	18%	17%	20%
30 years (since 1989)	69%	44%	57%
60 years (since 1959)	69%	55%	61%

CRITERION B:

Geographic distribution is precarious for either extent of occurrence AND/OR area of occupancy

	Critically Endangered (CR)	Endangered (EN)	Vulnerable (VU)	Near Threatened (NT)
B1. Extent of occurrence (EOO)	< 100 km ²	< 5,000 km ²	< 20,000 km ²	< 40,000 km ²
B2. Area of occupancy (AOO)	< 10 km ²	< 500 km ²	< 2,000 km ²	< 4,000 km ²
AND at least 2 of the following 3 conditions for CR, EN or VU:				AND (b) for NT
(a) Severely fragmented OR Number of locations	= 1	≤ 5	≤ 10	Not applicable
(b) Continuing decline observed, estimated, inferred or projected in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent and/or quality of habitat; (iv) number of locations or subpopulations; (v) number of mature individuals				≥ 10% within the longer of 10 years or 3 generations
(c) Extreme fluctuations in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) number of locations or subpopulations; (iv) number of mature individuals				Not applicable

Please refer to the '[Guidelines for Using the IUCN Red List Categories and Criteria](#)' for assistance with interpreting the criterion particularly in relation to calculating 'extent of occurrence', 'area of occupancy' and understanding of the definition and use of 'severely fragmented', 'locations', 'continuing decline' and 'extreme fluctuations'.

Please identify whether the species meets B1 or B2. Except for Near Threatened species, include an explanation, supported by data and information, on how the species meets at least 2 of (a), (b) or (c). For Near Threatened species, include an explanation, supported by data and information, on how the species meets (b).

Please note that locations must be defined by a threat. A location is a geographically or ecologically distinct area in which a single threatening event can rapidly affect all individuals of the species present.

If available, include information on:

- Whether there are smaller populations of the species within the total population and, if so, the degree of geographic separation between the smaller populations within the total population
- Any biological, geographic, human induced or other barriers enforcing separation

You must provide a response. If there is no evidence to demonstrate that the geographic distribution is precarious for either extent of occurrence AND/OR area of occupancy, this **must be** stated.

Black Grevillea meets criterion B for Critically Endangered on the basis of B1ab(i,ii,iii,iv,v) and Endangered on the basis of B2ab(i,ii,iv,v).

Extent of occurrence (EOO) (B1): 22 km², meeting the threshold for Critically Endangered.

Area of occupancy (AOO) (B2): 20 km², meeting the threshold for Endangered.

Fragmentation (B1a, B2a): Black Grevillea is 'severely fragmented' with more than half of its occupied habitat area in small or isolated patches. The occupied habitat areas of 58% of sites are ≤2,000 m², and 25% are <100 m² (see table below). The average patch size is 2,800 m². The largest patches are mostly in forested areas, where black grevillea plants occur at very low and rapidly declining densities. The minimum distance between neighbouring sites ranges from 160 to 1020 m (see table below). The northern locations (L1, L2, L3) are separated from the southern location (L4) by more than 10 km.

Table 1. Patch size and distance between patches

Site	Tenure	Patch size (m ²)	Closest site: metres distant
L1/S1	Road reserve	90	L1/S2: 1020 m
L1/S2	Road reserve	90	L1/S3: 450 m
L1/S3	Road reserve	2,700	L1/S2: 450 m*
L1/S4	Road reserve	80	L1/S3: 440 m
L1/S5	Road reserve	230	L2/S1: 530 m

L2/S1	Rail reserve	1,430	L1/S5: 530 m
L3/S1	Freehold (forest)	300	L1/S5: 780 m*
L4/S1	Freehold (forest & dam)	13,000	L4/S2: 160 m
L4/S2	Freehold (forest)	2,000	L4/S3: 140 m
L4/S3	Freehold (forest)	2,800	L4/S2: 140 m
L4/S4	Freehold (forest & dam)	7,900	L4/S3: 160 m
L4/S5	Freehold (dam)	2,900	L4/S4: 570 m

*The closest site has only six small plants, so the second-closest site has been recorded here.

Locations (B1a, B2a): the current number of locations is four. These have been distinguished by both their location (northern or southern) and tenure (road reserve, rail reserve or freehold) on the basis that tenure type is the main determinant of the site characteristics (shape, vegetation, habitat quality, management) and threats/recovery prospects. Location 1 sites (northern road reserves, managed by local government) are very narrow, linear and mainly treeless, with the highest grevillea densities, currently threatened mainly by weed invasion and stochastic processes (for the smaller sites). Because they are all on the same road or around the corner, they could all be threatened by a single event such as weed spraying or roadworks. The location 2 site (a northern rail reserve managed by Queensland Rail) is also linear, but wider than L1 sites, and much less open in vegetation structure. It has moderate grevillea densities, and is threatened mainly by railway works, weed invasion, increased vegetation density and disease. Location 3 (northern) and Location 4 (southern) sites are on freehold land in forested sites and, for L4 sites, around dams. They mostly have low grevillea densities, and are threatened by increased forest density, farm activities (such as dam modification, track creation, horse grazing), and weed invasion.

Continuing decline (B1b, B2b): declines in extent of occurrence, area of occupancy and occupied habitat area over the past three generations are summarised in the following table.

Table 2. Declines in extent of occurrence, area of occupancy and occupied habitat area over the past three generations.

Time period	EOO decline	AOO decline	OHA decline
10 years (since 2008)	18%	17%	20%
30 years (since 1989)	69%	44%	57%
60 years (since 1959)	69%	55%	61%

Continuing decline in extent of occurrence, B1/2b(i): as summarised in the table above, there has been a continuous decline in the EOO – estimated to be 69% over the past 30 years (the minimum estimated three-generation time) and 18% over the past 10 years. This decline in EOO is likely to continue due to the high vulnerability of sites at the edges of the current range of black grevillea due to small population sizes (vulnerable to stochastic effects as well as unabated threats), small occupied habitat areas and/or a recent precipitous decline:

- *northernmost site (L1/S4):* small population size (six small grevillea plants in 2019) and small occupied habitat area (<100 m² in 2019)
- *westernmost site (L1/S1):* small occupied habitat area (<100 m² in 2019), and a 70% decline in OHA over the past 10 years
- *southernmost site (L4/S5):* small population size (20 in 2019) and a 67% decline in population over the past 10 years.

None of the major threats to these sites are being abated, so ongoing decline in EOO exceeding the 10% threshold can be inferred.

Continuing decline in area of occupancy, B1/2b(ii): as summarised in the table above, there has been a continuous decline in the AOO – estimated to be 44% over the past 30 years (the minimum estimated three-

generation time) and 17% in the past 10 years. Unless there is a concerted recovery effort, this decline is likely to continue due to the vulnerability of many current sites (in particular those with very small numbers and occupied habitat areas), the high threat levels at all sites and recent precipitous declines:

- *Low population size*: three sites (L1/S4, L1/S5, L4/S5) had 20 or fewer plants in 2019 and another five sites had ~50 or fewer plants.
- *Small occupied habitat areas*: three sites (L1/S1, L1/S2, L1/S4) had OHAs of <100 m² in 2019.
- *Recent precipitous declines*: eight sites (L1/S1, L1/S5, L2/S2, L3/S2, L4/S2, L4/S3, L4/S4, L5/S5) have declined in population size and/or occupied habitat area by >50% over the past 10 years.

The likely loss of sites L1/S1 (OHA of <100 m² and 70% decline in OHA over the past 10 years) and L2/S1 (40% decline in numbers over the past 10 years) over the following three generations would lead to a 40% decline in AOO. Other arrangements of the 2 x 2 km² grid would indicate a similar decline due to the likely loss of L1/S4 (six small plants remaining) and L4/S5 (20 plants, population decline of 67% over the past 10 years). None of the major threats to these sites are being abated, so ongoing decline in AOO exceeding the 10% threshold is inferred.

Continuing decline in habitat area, extent and/or quality, B1/2b(iii): as summarised in the table above, there has been a continuous decline in occupied habitat area – estimated to be 57% over the past 30 years (the minimum estimated three-generation time) and 20% in the past 10 years – reflective of declining habitat quality. Over the past 10 years the loss in OHA has been mainly due to habitat destruction (particularly the destruction of site L2/S2 in 2012 due to grading of a rail reserve), increased forest density due to regrowth/thickening and pine invasion (likely to be the major factor in the loss of sites L3/S2, L4/S6 and OHA decline in sites L3/S3, L3/S4) and weed invasion (most sites). None of these major threats have been abated, so ongoing decline in habitat area, extent and/or quality exceeding the 10% threshold is inferred.

Continuing decline in number of locations, B1/2b(iv): over the past 30 years (the estimated three-generation time), there has been the loss of one location (L5, southern road reserves, one site). Two locations, each with just one remaining site after recent losses of other sites, are highly threatened to loss in the near future:

- *L2 (northern rail reserves, one remaining site)*: due to the destruction of site L2/S2 in 2012 and a decline in population size at the other site (L2/S1) by 40% over the past 10 years. There is a very high threat level at L2/S1 due to weed invasion, increased vegetation density, careless site management and disease/stress. There was a large number of plants at this site in 2019 that had recently died (11 plants, equivalent to 21% of the live population).
- *L3 (northern freehold land, one remaining site)*: due to the loss of two sites (L3/S2, L3/S3) over the past 30 years probably due to weed invasion, increased forest density and horse/cattle grazing and the decline in estimated OHA of the existing site (L3/S1) by >90%. This site is currently threatened by weed invasion (particularly pines) and increased forest density. It could easily be destroyed if horses were introduced, as has occurred in the adjoining paddock, where all grevillea plants have been lost.

Due to the likely loss of one or both of these sites, it is reasonable to infer a 25% or 50% decline in locations over the next three generations.

Projected decline in population, B1/2b(v): a population decline exceeding 10% over the next three generations is projected based on observed population declines at locations L2 and L4 over the past 10 years, inferred population declines at L3 over the past 30 years, suspected population declines at L1 over the past 30 years, and the current high level of threats and lack of conservation management at all locations. This is despite an overall population increase of 20% over the past 10 years due to a population doubling at the most populous site (L1/S3). The rationale for projected population declines in each location is as follows:

- *Location 2 (northern rail reserves)*: over the past 10 years, the population size has undergone an observed decline of 69% due to the destruction of one site (L2/S2) and a 40% population decline at the other site (L2/S1). There are very severe threats operating at this remaining site, as mentioned above.
- *Location 4 (southern freehold)*: over the past 10 years, the population size has undergone an observed decline of 34% probably due mainly to increased forest density and weed invasion, threats which are ongoing. The population decline is despite an increased population size at site L4/S1 due to colonisation of an area next to a dam scraped in the early 2000s. The sites at this location are also vulnerable to threats from farming activities. Dam modifications for example, could extirpate most of the subpopulation, which occurs around three linked dams. This is rendered more likely by the recent agreement of the Queensland

Government to part-fund the proposed new Emu Swamp Dam. The horticultural enterprise at this location (Eastern Colour) has indicated an intention to use this water, which would involve installing pipes and possibly increasing dam capacity (Jacobs 2019). Population decline would also occur if horses were grazed (as has occurred in a now former site, L4/S5).

- *Location 3 (northern freehold)*: over the past 30 years, the population size has undergone a substantial inferred decline due to the >90% loss of OHA, including the loss of two sites (see second dot point above for decline in locations). The subpopulation at the remaining site continues to decline due to pine invasion and increased forest density, as well as the potential introduction of horses, which occurred in an adjoining paddock that used to support grevilleas.
- *Location 1 (northern road reserves)*: although the population size of L1 has increased by 90% over the past 10 years, the estimated OHA decreased by 29% over the same period. The most populous site (L1/S3), which hosts 60% of the 2019 population and almost doubled in population size over the past 10 years, had a stable OHA over the past 10 years, but has suffered an estimated 30% loss of OHA over the past 30 years. The recent increase in population may be due to recovery from prior burning (Donatiu 2006) or mowing by landowners (Jenny Holmes, email to federal environment department, April 2017). Two other sites (L1/S1, L1/S5) have suffered an observed >50% contraction in OHA over the past 10 years. The currently severe threat of weed invasion is likely to further reduce the area of habitat available, including at L1/S3, unless there is much better management in future.

Other indicators to support a projection of declining population over the next three generations include:

- a decline in population size by 50–100% over the past 10 years in the majority of sites (nine of the 15 sites surveyed in 2008)
- the loss over the past 30 years of nine of 21 sites (the corresponding population loss is unknown)
- very low population numbers in 75% of current sites (≤ 20 in three sites, ≤ 50 in five additional sites) leaving them vulnerable to stochastic effects
- the precarious level of protection, lack of conservation management and the severity of threats at all sites, including the most populous site with 60% of the current population.

Conclusion: Black Grevillea meets criterion B for Critically Endangered by meeting the following thresholds:

- B1: EOO 22 km² (Critically Endangered)
- B1a: severe fragmentation
- B1b(i,ii,iii,iv): inferred continuing declines of EOO, AOO, OHA and number of locations >10% over three generations
- B1b(v): projected decline of population >10% over three generations.

A note about error levels: there is some degree of uncertainty about the population counts and areas of occupancy due to the following factors: (1) because of the sprawling habit of black grevilleas it can be difficult to discern individual plants in areas where the grevilleas are dense (mainly on road reserves). This is most likely to lead to an overestimate of numbers; (2) because the grevilleas are sparsely distributed in forested areas, some individuals are likely to have been missed, leading to an underestimate in numbers (likely to be minor because the overall numbers in this habitat are low) and the occupied habitat area; and (3) there may be mature individuals on private properties that have not been accessed or surveyed. These are likely to be few in number given the low numbers and densities in the known sites on private properties. There is also some uncertainty about a few past records due to imprecise coordinates or coordinates that conflict with site descriptions.

CRITERION C

Small population size and decline				
	Critically Endangered (CR)	Endangered (EN)	Vulnerable (VU)	Near Threatened (NT)
Estimated number of mature individuals	< 250	< 2,500	< 10,000	< 20,000
AND either (C1) or (C2) is true				AND (C1) is true
C1 An observed, estimated or projected continuing decline of at least (up to a max. of 100 years in the future	25% in 3 years or 1 generation (whichever is longer)	20% in 5 years or 2 generations (whichever is longer)	10% in 10 years or 3 generations (whichever is longer)	10% in 10 years or 3 generations (whichever is longer)
C2 An observed, estimated, projected or inferred continuing decline AND its geographic distribution is precarious for its survival based on at least 1 of (a) or (b):				
(a) (i) Number of mature individuals in each subpopulation	≤ 50	≤ 250	≤ 1,000	Not applicable
(a) OR				
(a) (ii) % of mature individuals in one subpopulation =	90 – 100%	95 – 100%	100%	Not applicable
(b) Extreme fluctuations in the number of mature individuals	Applicable	Applicable	Applicable	Not applicable

Please identify the estimated total number of mature individuals and either an answer to C1 or C2. Include an explanation, supported by data and information, on how the species meets the criteria. **Note:** If the estimated total number of mature individuals is unknown but presumed to be likely to be >10 000, you are not required to provide evidence in support of C1 or C2, just state that the number is likely to be >10 000.

You must provide a response. If there is no evidence to demonstrate small population size and decline this **must be stated**.

Black Grevillea meets criterion C for Endangered. The number of mature individuals counted in 2019 was 1446, meeting the threshold for Endangered, and there is sufficient evidence of decline for C1.

C1: a decline over the next two generations (an estimated 20–60 years) is projected based on the following: (a) a decline in the occupied habitat area at all four locations and in population size at two of four locations over the past 10 years; (b) an overall decline in the occupied habitat area by 20% over the past 10 years; (c) the decline in EOO by 69% and AOO by 44% over the past 30 years; (d) the vulnerability of many sites to stochastic effects due to small numbers (eight of 12 sites with ≤50 plants, most of which have suffered recent declines); (e) the high level of threat to most sites by weed invasion or habitat loss or degradation; (f) the lack of conservation management such as weed control and appropriate fire management at any site; (g) the lack of any populations in conservation reserves; and (h) the lack of basic knowledge of this taxon, including appropriate fire and disturbance regimes. Although there has been an overall increase in the population over the past 10 years, due to a 90% increase in plant density in the most populous site (L1/S3, with 60% of the total population), this appears to be a fire-driven fluctuation. Overall, there is sufficient evidence to project a population decline above 20% over the next two generations.

C2(a): the number of mature individuals in two locations (L2, L3) is below the threshold of 250 and just above the threshold in one location (L4), but the number in L1 (about 1000) exceeds the threshold.

C2(b): there is no evidence of extreme fluctuations in the number of mature individuals.

CRITERION D:

Very small population				
	Critically Endangered (CR)	Endangered (EN)	Vulnerable (VU)	Near Threatened (NT)
D1. Number of mature individuals	< 50	< 250	D1. < 1,000	D1. < 3,000
OR				
D2. [Only applies to the VU and NT categories] Restricted area of occupancy or number of locations with a plausible future threat that could drive the taxon to CR or EX in a very short time.	Not applicable	Not applicable	D2. Typically: AOO < 20 km ² or number of locations ≤ 5	D2. Typically: AOO < 40 km ² or number of locations ≤ 10

Please identify the estimated total number of mature individuals and evidence of how the figure was derived.
For Criterion D2, please provide information on the species' area of occupancy, number of locations and plausible threats.

You must provide a response. If there is no evidence to demonstrate eligibility, this **must be** stated.

Black Grevillea meets criterion D2 for Vulnerable. The number of mature individuals counted in 2019 was 1446. The AOO is only 20 km², and the number of locations is four. The current and future threats of vegetation clearing and habitat degradation and the effects of invasive weeds, pests and diseases are acting in each location, so it is plausible that the species could be driven to Critically Endangered or Extinct in the Wild in a very short time.

CRITERION E:

Quantitative Analysis				
	Critically Endangered (CR)	Endangered (EN)	Vulnerable (VU)	Near Threatened (NT)
Indicating the probability of extinction in the wild to be:	≥ 50% in 10 years or 3 generations, whichever is longer (100 years max.)	≥ 20% in 20 years or 5 generations, whichever is longer (100 years max.)	≥ 10% within 100 years	≥ 5% within 100 years

Please identify the probability of extinction and evidence of how the analysis was undertaken.

You must provide a response. If there has been no quantitative analysis undertaken this **must be** stated.

No quantitative analysis has been undertaken.

SUMMARY OF CRITERIA UNDER WHICH THE SPECIES IS ELIGIBLE FOR LISTING AS: CR, EN, V, NT, EW or EX

Please mark the criteria and sub-criteria that apply.

- Criterion A A1 (specify at least one of the following) a) b) c) d) e); **AND/OR**
 A2 (specify at least one of the following) a) b) c) d) e); **AND/OR**
 Endangered A3 (specify at least one of the following) a) b) c) d) e); **AND/OR**
 A4 (specify at least one of the following) a) b) c) d) e)
- Criterion B B1 (specify at least two of the following) a) b) c); **AND/OR**
 Critically Endangered B2 (specify at least two of the following, other than NT) a) b) c)
- Criterion C estimated number of mature individuals **AND**
 C1 **OR**
 C2 a (i) **OR** a (ii) **OR**
 C2 b)
- Criterion D D **OR** D2

Vulnerable

Criterion E

EX

EW

LC

Species nominated to change from a higher conservation class to Least Concern.

No above boxes apply.

Other Considerations

*INDIGENOUS CULTURAL SIGNIFICANCE

Is the species known to have cultural significance for Indigenous groups within Australia? If so, to which groups? Provide information on the nature of this significance if publicly available.

Not known.

FURTHER STUDIES

Identify relevant studies or management documentation that might relate to the species (e.g. research projects, national park management plans, recovery plans, conservation plans, threat abatement plans, etc.).

The only relevant documents are the federal conservation advice (TSSC 2008) and a draft recovery plan for threatened flora of the Stanthorpe Plateau (Donatiu 2006).

ADDITIONAL COMMENTS/INFORMATION

Please include any additional comments or information on the species such as survey or monitoring information, and maps that would assist with the consideration of the nomination.

IMAGES OF THE SPECIES

Please include or attach images of the species if available, and indicate if you are in a position to authorise their use.

[Click or tap here to enter text.](#)

Reviewers and references

REVIEWER(S)

Has this nomination been peer-reviewed? Have relevant experts been consulted on this nomination? If so, please include their names, current professional positions and contact details.

RO (Bob) Makinson
Senior Scientist Threatened Species
NSW Department of Planning, Industry and Environment

Jenny Holmes
Botanist (conducted surveys in 2008)

REFERENCE LIST

Please list key references/documentation you have referred to in your nomination.

Clarke PJ, Knox JE (2002) Post-fire response of shrubs in the tablelands of eastern Australia: do existing models explain habitat differences? *Australian Journal of Botany* 50, 53–62.

Dodd I (1991) The ecology and distribution of *Grevillea scortechinii*. Student research project. University of Queensland.

Donatiu P (2006) *Stanthorpe Plateau Threatened Flora Recovery Plan 2007–2011*. Report to the Department of the Environment and Heritage. Queensland Murray-Darling Committee.

Higgins PJ, Peter JM, Steele WK (editors) (2001) *Handbook of Australian, New Zealand and Antarctic Birds*. Oxford University Press.

Holmes J, Holmes G (2008) *Botanical survey of four threatened plants: Northern Stanthorpe Plateau, Queensland*. Glenn Holmes & Associates.

- Hunter JT (2005). Vegetation and floristics of Warra National Park and Wattleridge, Northern Tablelands NSW. *Cunninghamia* 9(2): 255–274.
- Jacobs (2019) *Granite Belt Irrigation Project*. Detailed business case for Stanthorpe and Granite Belt Chamber of Commerce.
- Makinson RO (2000) *Grevillea*, *Flora of Australia*, Vol 17A, p. 68.
- McGillivray DJ (1986) *New names in Grevillea*. Self-published.
- McGillivray DJ, Makinson RO (1993) *Grevillea - a taxonomic revision*. Melbourne University Press.
- Scortechini B (1883) Contributions to the flora of Queensland. *Proceedings of the Linnean Society of New South Wales* 8: 168–175.
- SRWC (2018) *Flora of the Granite Belt*. Stanthorpe Rare Wildflower Consortium.
- SRWC (2019) Surveys of *Grevillea scortechinii* subsp *scortechinii*, May to July 2019, unpublished results. Stanthorpe Rare Wildflower Consortium.
- TSSC (2008) *Approved conservation advice for Grevillea scortechinii* subsp. *scortechinii* (*black grevillea*). Threatened Species Scientific Committee, Australian Government.

Nominator's Details

Note: Your details are subject to the provisions of the *Privacy Act 1988* and will not be divulged to third parties, except for state and territory governments and scientific committees that have agreed to collaborate on national threatened species assessments using a CAM. If there are multiple nominators please include details below for all nominators.

TITLE (e.g. Mr/Mrs/Dr/Professor/etc.)

Dr/Ms

FULL NAME

Carol Booth / Liz Bourne

ORGANISATION OR COMPANY NAME (IF APPLICABLE)

Stanthorpe Rare Wildflowers Consortium

CONTACT DETAILS

DECLARATION

I declare that, to the best of my knowledge, the information in this nomination and its attachments is true and correct.

Signed: [Click here to enter text.](#)

Date: 12/08/2019

** If submitting by email, please attach an electronic signature*

Lodging your nomination

Completed nominations may be lodged either:

1. by email in Microsoft Word format to: SpeciesTechnical.Committee@des.qld.gov.au
2. by mail to: The Chair
Species Technical Committee
Queensland Herbarium
Mount Coot-tha Rd
Toowong QLD 4066

*** If submitting by mail, you must include an electronic copy on a memory stick.**

Recommended citation:

Booth CJ and Bourne E (2020) Nomination form to change the conservation class of *Grevillea scortechinii* subsp. *scortechinii* in Queensland. Stanthorpe Rare Wildflower Consortium, Stanthorpe.