

FLORA & FAUNA
GUARANTEE

NOMINATION NO. **886**
POTENTIALLY THREATENING PROCESS

FLORA AND FAUNA GUARANTEE - SCIENTIFIC ADVISORY COMMITTEE

PRELIMINARY RECOMMENDATION ON A NOMINATION FOR LISTING

Invasion of native vegetation habitat by Karamu *Coprosma robusta* Raoul (Potentially Threatening Process)

Dates of consideration: 6 May, 13 June, 8 August, 22 October, 5 December 2019 and 6 February, 6 March, 13 May and 19 June 2020

File No.: FF/54/3799

Validity: The nomination is for a valid item

Prescribed Information: The prescribed information was provided.

Name of the Nominator is adequately provided.

Name of the Item is adequately provided.

In the opinion of the Scientific Advisory Committee (SAC) the process is adequately defined and described. The nominated process is defined as the 'Invasion of native vegetation habitat by Karamu *Coprosma robusta* Raoul'.

The nomination provided the following description of the potentially threatening process (PTP).

Detailed assessments of the impact potential of Karamu of relevance to its listing as a Threatening Process are contained in tabular form in Agriculture Victoria (2019a,b) and in comparison with other environmental weeds in White et al. (2018). Here the SAC expands on these listings using more recent information and expert advice from the Mornington Peninsula area.

Biology: Karamu is a fast-growing, highly-invasive New Zealand native vascular-plant to 6 m that has gained a foothold in the Mornington Peninsula, Dandenong Ranges (Parks Victoria 2017), and Glenelg regions (VicFlora 2019). It forms dense thickets, creating a monoculture capable of destroying existing understory vegetation in 2–3 years (DPIPWE 2019; Agriculture Victoria 2019a; Michelle Stacy *pers. comm.* 2019; Gidja Walker *pers. comm.* 2019). In the longer term it acts like a transformer - smothering existing vegetation communities and preventing growth of other flora (Agriculture Victoria 2019 a,b; MCCLG 2019). This potential is emphasised by recent experiences in Tasmania where Karamu has spread rapidly over substantial areas along the Derwent River, including across wetlands, and even into the water (DPIPWE 2019).

Karamu has been found to hybridise with native species (*Coprosma quadrifida*) and is considered to have high potential for hybridisation with other endemic species such as *Coprosma hirtella* (MCCLG 2019). It also has proved difficult to eradicate in Tasmania, requiring a comprehensive plan for removal and follow-up action – and as a result, Karamu recently has been declared as a noxious weed in Tasmania (DPIPWE 2019).

Status: In Australia, Karamu mostly has been confined to Tasmania and Victoria. In Victoria, it is listed as a major weed for the Yarra Ranges National Park (Parks Victoria 2019), and is rapidly spreading and hybridising on the Mornington Peninsula (MCCLG 2019).

Invasive Potential: Extensive New Zealand experience indicates Karamu is a robust, invasive species that is established “throughout coastal, lowland and lower montane habitats within shrublands and open sites within forest” (NZPCN 2019). Thus, Karamu has the potential to pose a threat to large tracts of Victoria, as is confirmed by the biodiversity risk assessment in White et al. (2018). They placed Karamu in the top 20 of all Victorian environmental weeds based on the following attributes: impact on natural systems; area of potential distribution remaining; potential for invasion; rate of dispersal; and range of susceptible habitat types. This ranking is higher than those for species currently listed under Potentially Threatening Processes, such as Coast and Sallow Wattles *Acacia longifolia* subsp. *sophorae* and *Acacia longifolia* subsp. *longifolia* (SAC 2016), and Sweet Pittosporum *Pittosporum undulatum* (SAC 1994). Karamu also was assessed by White et al (op. cit) as a higher risk than such widely-advertised state prohibited weeds as Mexican Needle Grass *Nassella tenuissima*, and regionally prohibited or controlled weeds such as Gorse *Ulex europaeus*.

Fire Potential: Here there are two views: Karamu has been suggested as a “definite fire hazard” as it fills the understory up to 6 m and thus can torch fire up to the crown much more efficiently than the sparse understory scrub

in those EVCs most at threat of invasion (Agriculture Victoria 2019a); but in New Zealand it is considered to be a low fire hazard (Fire and Emergency NZ 2019).

Control and Removal Issues: Treatment of Karamu using combinations of spraying, cut and paint, drill and fill, and slashing can be quite effective at removing existing plants (MCCLG 2019). But new germination rapidly leads to re-establishment of dense seedling cover (MCCLG 2019; DPIPWE 2019). Thus, remedial action requires a substantial commitment of resources over several years.

The SAC provides the following additional background information.

Several assessments of the weed potential of Karamu in Australia have been made. DJPR (2019) provide ratings for various impact categories including social, abiotic, community habitat, fauna, pest animal and agriculture. The highest ratings given to Karamu are for its ability to invade undisturbed sites, fast growth rate, large number of fruit, long reproductive period, range of dispersal mechanisms and potential to disperse long distances. It has been identified as a very serious threat to damp and wet sclerophyll forest communities (Carr et al. 1992; Blood 2001; Muylt 2001). On the Mornington Peninsula it is rated as a 'very high risk' weed species (Schmidt et al. 2018) based on methodology in Carr et al. (1992).

The Advisory List of Environmental Weeds in Victoria (White et al. 2018) describe the impact of Karamu on natural systems as typically significant and that there is extensive potential for further spread within the State (White op cit.). Climate matching for Karamu in Tasmania suggests that it could potentially invade much of coastal Victoria (DPIPWE 2019).

Karamu has invaded some conservation areas in Victoria. For example, it has invaded the general area on the Mornington Peninsula where Dainty Maidenhair (*Adiantum capillus-veneris* – FFG Act listed) has been recorded, and it is thought to pose a direct threat to its survival (Environmental Weeds of Australia 2016). However there is conflicting information regarding the current threat Karamu is having on this fern (Molnar 2003) with some observers noting that Karamu may provide suitable shade viz. Adair & Groves (1998, Appendix) note that: '(*C. robusta* is a)...potential competitor but may offer some shade' and 'Weeds may limit dispersal of *Adiantum*.'

Birds are reported to be the main vectors for the spread of Karamu fruit and seeds in both New Zealand (eg. Burrows 1995; Williams & Karl 1996; Williams 2006; MacFarlane et al. 2016) and Australia. The likely native bird vectors in this respect are Silvereye (*Zosterops lateralis*), Red Wattlebird (*Anthochaera carunculata*) and Mistletoebird (*Dicaeum hirundinaceum*), with introduced species being Common Blackbird (*Terdus merula*) and Song Thrush (*T. philomelos*) (Cleland 1952, Loyn & French 1991). Williams (2006), working on spread of weeds in New Zealand, noted that 'The capacity of blackbirds to consume large numbers of fruit greater than 7–8 mm diameter, i.e. greater than commonly eaten by silvereyes, places blackbirds in a potentially important position as dispersers in a range of habitats.' Given that Blackbirds are a very common inhabitant of much of southern and north-eastern Victoria (Emison et al. 1987, DELWP 2019), and exhibit a high reporting rate in southern Victoria, the potential for spread of Karamu into other areas of the state is high. With respect to native species, Silvereyes are fruit specialists and are common throughout Victoria. In south eastern Australia Silvereyes have been found to be the most abundant consumers of *Coprosma quadrifida* fruits (French et al. 1992), and would be expected to consume fruit from similar species of *Coprosma* when it is encountered.

This report by the SAC is based on an assessment of the available information.

The nomination identified three FFG Regulations criteria, 5.1.1, 5.1.2 and 5.2.1 of the Flora and Fauna Guarantee Regulations 2011. The 2011 Regulations have been replaced by the Flora and Fauna Guarantee Regulations 2020. The SAC is now required to consider the nomination according to the 2020 Regulations and the equivalent criteria are now 1.1, 1.2 and 2.1 of Schedule 3. The SAC's response to these is as follows:

Evidence provided:

Criterion 1.1 *The potentially threatening process poses, or has the potential to pose, a significant threat to the survival of two or more taxa*

Evidence:

The nomination argued that:

- certain plant species (Table 1) were potentially threatened by the invasion of *C. robusta* into native vegetation

Table 1: Species identified in the nomination as at risk due to the invasion of *Coprosma robusta* in Victoria.

Scientific name	Common name	Victorian advisory listing (DEPI 2014)	FFG Act listed	EPBC Act listed
<i>Acacia</i> species including <i>Acacia melanoxylon</i> and <i>Acacia dealbata</i> ¹	Wattles	-	-	-
<i>Acrotriche cordata</i>	Coast Ground-berry	Rare	-	-
<i>Adiantum capillus-veneris</i>	Dainty Maidenhair Fern	Endangered	Listed	-
<i>Caladenia thysanochila</i>	Fringed Spider-orchid	Extinct	Listed	Endangered
<i>Coprosma hirtella</i>	Rough Coprosma	-	-	-
<i>Coprosma quadrifida</i>	Prickly Currant Bush	-	-	-
<i>Exocarpos syrticola</i>	Coast Ballart	Rare	-	-
<i>Glycine latrobeana</i>	Clover Glycine	Vulnerable	Listed	Vulnerable
<i>Leptospermum</i> species ¹	Tea-tree	-	-	-
<i>Ninox strenua</i>	Powerful Owl	Vulnerable	Listed	-
<i>Prasophyllum litorale</i>	Coast Leek-orchid	Vulnerable	Listed	-
<i>Pterostylis cucullata</i>	Leafy Greenhood	Endangered	Listed	Vulnerable
<i>Stackhousia spathulata</i>	Coast Stackhousia	Poorly known	-	-
Non-threatened fauna such as thornbills (<i>Acanthiza</i>), wrens (<i>Malurus</i>), other insectivores.	-	-	-	-

1. Some species are listed at state or national level as threatened.

Table 2: Ecological Vegetation Classes identified by nominator as threatened by the invasion of *Coprosma robusta*

EVC Number	Ecological Vegetation Class
29	Damp Forest (Southern Fall)
23	Herb-rich Foothill (Southern Fall)
201	Shrubby Wet Forest (Southern Fall)

The nominator also argued that the native Prickly Currant Bush *Coprosma quadrifida* was threatened by hybridisation with *C. robusta*. viz. 'Observed cross hybridisation with Karamu, apparently spreading rapidly, potential for impacted evolution of this native species.'

The SAC notes that for the nominated item to be supported for listing, two or more flora (or fauna) taxa need to be identified as threatened by the described process. Although a number of species were identified in the nomination document as being potentially threatened by the spread of Karamu, it is the opinion of the SAC that such threats to these taxa have not been clearly and adequately demonstrated. DJPR (2019) noted at the time of their assessment, there were no documented impacts to threatened flora or fauna species by Karamu, and that conversion of habitat is likely to lead to a reduction in numbers of individuals. The SAC acknowledges there is potential that Karamu is a threat to some taxa (threatened or otherwise) though argument for significant threats to the survival of two or more taxa are insufficient. Threats to any flora or fauna in Victoria where Karamu has been recorded were not identified in the nomination material provided by the nominator. The SAC may regard evidence of Karamu impacts where it demonstrates a clear threat to the survival of a taxon that is geographically restricted or comprises small dispersed populations. As Karamu is in its early development stage of naturalisation in Victoria, it is tractable with appropriate intervention to the extent that there should be negligible impacts to native taxa. Comments on potential threats to species in Table 1 are provided for further clarification.

Criterion 1.2 *The potentially threatening process poses, or has the potential to pose, a significant threat to the survival of a community of flora or fauna*

Evidence:

The nomination argued that:

- 'Left unchecked, Karamu poses a high risk threat to the survival of entire communities' (Table 2)
- at least three Ecological Vegetation Classes (EVCs)(Table 2) were threatened by the invasion of *C. robusta*

The nomination identifies three Ecological Vegetation Classes as well as unspecified communities across Victoria in coastal, lowland and lower montane ecosystems. The SAC is of the view that the specific communities at risk have been insufficiently described in the nomination and argues that those described are too broad for consideration of possible impacts by Karamu. The nomination states its 'proven ability to smother entire communities', however the SAC views this as patch or site disturbance rather than a potentially significant threat to a defined community. A scenario with absence of management

intervention at the scale of a community is considered implausible by the SAC and therefore unlikely to lead to a significant threat to a community.

The origin of Karamu in Australia is attributed to horticulture with the first Australia herbarium collection from Tasmania in 1937 and the first Victorian collection from Mount Dandenong (Vic) in 1977 (Hosking et al. 2007, ALA 2019). Karamu has since demonstrated capacity to naturalise in some areas of Victoria, as described in the nomination. Its introduction to NSW is apparently more recent where it is known from a few sites (Hosking et al. 2007). Despite its capacity to spread, there is little evidence that Karamu has surfaced more widely over the last 30 years as a naturalised component of native vegetation in Victoria.

Criterion 2.1 *The potentially threatening process poses or has the potential to pose a significant threat to the evolutionary development of two or more taxa.*

Evidence:

The nomination argued that:

- 'Karamu therefore has the potential to pose an evolutionary threat to two or more taxa. It already has started hybridisation with *Coprosma quadrifida* on the Mornington Peninsula and is considered to have the potential for hybridisation with other species.'

The reproductive biology of Karamu in the context of hybridisation with Australian native *Coprosma* species has not been studied. A precautionary approach may allow for the consideration of potential evolutionary development impacts to *C. quadrifida* or *C. hirtella* due to observations of putative hybrids (photographic evidence provided by the nominator) and absence of other information. Both *Coprosma* species nominated as being at risk are widespread species with large population sizes. The SAC considers it unlikely that development of hybrids within the limited areas of co-occupation will manifest to a significant threat to the evolutionary development of these species. There are no native *Coprosma* species with small population sizes within the region of current Karamu distribution which would require further consideration. Furthermore, the reproductive capacity or ecological effects of the resulting hybrids is not known.

Ineligibility for listing as a potentially threatening process under the Flora and Fauna Guarantee

It is the view of the SAC that, on the evidence currently available, the nominated item does not satisfy at least one criterion of the set of criteria prepared and maintained under Division 2 of Part 3 of the *Flora and Fauna Guarantee Act 1988*, and stated in Schedule 3 of the *Flora and Fauna Guarantee Regulations 2020*.

Additional information

The SAC has previously assessed a suite of other potentially threatening processes attributed to separate weed species impacts on biodiversity. The nomination of 'The invasion of native vegetation by Blackberry *Rubus fruticosus* L. agg.' (PTP 733) was supported for listing by the SAC as it met the relevant criteria. The nominations 'Invasion of native vegetation communities by Tall Wheat-grass *Lophopyrum ponticum*' (PTP 811) and 'Loss of biodiversity as a result of the spread of Coast Wattle and Sallow Wattle into areas outside its natural range' (PTP 877) was supported for listing by the SAC as they met the relevant criteria.

Preliminary Recommendation of the SAC

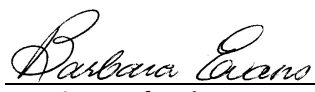
The SAC concludes that on the evidence available the nominated item is not eligible for listing in accordance with Section 16 of the Act because no primary criteria in the *Flora and Fauna Guarantee Regulations 2020* have been satisfied.

The Scientific Advisory Committee makes a preliminary recommendation that the nominated item not be supported for listing under the *Flora and Fauna Guarantee Act 1988*.

Endorsement by the Convenor of the Scientific Advisory Committee

Date

19 June 2020



Emeritus Prof Barbara Evans
Convenor

Selected references:

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