



**FLORA & FAUNA  
GUARANTEE**

NOMINATION NO. **647**  
PTP

## FLORA AND FAUNA GUARANTEE - SCIENTIFIC ADVISORY COMMITTEE

### FINAL RECOMMENDATION ON A NOMINATION FOR LISTING

#### **Loss of coarse woody debris from Victorian native forests and woodlands** (Potentially Threatening Process)

**Date of receipt of the nomination:** 26 November 2002  
**Date of preliminary recommendation:** 11 February 2003  
**Date of final recommendation:** 4 April 2003

**File No.:** FF/54/0246

**Validity:** The nomination is for a valid item

**Prescribed Information:** The prescribed information was provided.

**Name of the Nominator** is adequately provided.

#### **Name and Description of the process:**

In the opinion of the SAC the process is adequately defined and described.

The nominated process is defined as the loss of coarse woody debris (CWD, here defined as fallen dead trees, logs and large branches) from Victorian terrestrial habitats which occurs as a result of: the removal of forest and woodland waste left after timber harvesting, collecting for firewood, burning on site, mulching on site, and the removal of fallen branches and litter as general 'tidying up'.

The impacts of this process are recognised as major factors contributing to the loss of biological diversity in Australian woodlands (ANZECC 2001). It has been estimated that an average of 20 tonnes per hectare (*t/ha*) of CWD remains on the floodplains of south-eastern Australia where it has been estimated that 90-125 *t/ha* were once present (Mac Nally *et al.* 2001). This may be of the order of 15% of the pre-European-settlement levels (Mac Nally *et al.* 2000a,b). Fallen timber volumes in Victorian forests and woodlands have been massively manipulated both through direct means (fire-wood collection, fuel reduction) and through indirect activities (silvicultural management preventing trees reaching senescence).

Many species of trees shed lateral branches as a natural part of growth and development and self pruning is well known in many species of eucalypts (Lindenmayer *et al.* 2002). When large trees (or parts thereof) eventually collapse or fall, they provide a range of resources for different groups of fauna. This fallen timber (CWD), is a major habitat structural element for animals and some plants throughout forested areas worldwide. Hollow logs on the forest or woodland floor are used by many birds and ground-dwelling animals (particularly mammals) for shelter and as foraging sites (eg. How 1983; Dickman 1991; Scotts 1991). Logs have many values for forest and woodland biodiversity including: (a) providing nesting and sheltering sites for biota, (b) providing foraging substrates for predators ranging from snakes to velvet worms, (c) providing hibernation sites for biota, (d) providing basking sites for reptiles, (e) facilitating animal movement, (f) providing places for key social behaviours, (g) acting as plant germination sites, (h) providing substrates to promote the growth of fungi, (i) providing mesic refugia for an array of organisms during drought and/or fire, and (j) contributing to heterogeneity in the litter layer and patterns of ground cover (Lindenmayer *et al.* 2002).

Coarse woody debris or 'mature timber habitat' (Grove 2001) has been stripped from many rivers and floodplains in Australia. On floodplains CWD is thought to be ecologically significant because it: (i) yields structural habitat for floodplain fauna during both dry periods (invertebrates, non-fish vertebrates) and inundated phases (eg. fish, aquatic invertebrates and micro-organisms) (ii) may be a nutrient source/trap for invertebrates and for flora (including fungi), and (iii) provides retentive structures for trapping finer debris, in-flowing nutrients and sediment, producing much more complex local microhabitats for animals. The removal of woody debris from freshwater streams is already listed as a threatening process in Victoria (SAC 1991) and is not covered in this nomination.

- The nominated process has an impact across all woodland and forest types in Victoria.
- There is strong evidence that many flora and fauna species, and the communities they inhabit, are adversely affected by the nominated process.

**The range of flora or fauna affected or potentially affected** was adequately stated in the nomination.

**Significance of the threat which the potentially threatening process poses or has the potential to pose** was adequately stated in the nomination.

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

The nominated item satisfies at least one criterion of the set of criteria prepared and maintained under Section 11 of the **Flora and Fauna Guarantee Act 1988**, and stated in Schedule 1 of the Flora and Fauna Guarantee Regulations 2001.

**Evidence that criteria are satisfied:**

**Criterion 5.1:** *The potentially threatening process poses or has the potential to pose a significant threat to the survival of a range of flora or fauna.*

**Evidence:**

Dead trees and fallen timber provide important habitat for a suite of vertebrate and invertebrate species that depend on dead wood (logs, hollows) for their survival. These include a range of species which feed, breed, or shelter on or in dead wood or may be a predator, or a parasitoid dependent on species that live on dead wood (Table 1, 2).

The continued, unsustainable removal of coarse woody debris from woodlands is likely to have long term detrimental effects on biodiversity. Ecological impacts include loss of habitat and food sources for native fauna, a decline in soil nutrients and quality, and soil erosion.

**Sub-criterion 5.1.1** *The potentially threatening process poses or has the potential to pose a significant threat to the survival of two or more taxa.*

**Evidence:**

The survival of a range of flora and fauna has been significantly compromised to the point where a number of taxa are facing possible extinction and many more are in decline, as a result of loss and removal of coarse woody debris. Loss and removal of logs and dead trees has adversely affected a number of rare and threatened taxa in Victoria and there have already been a number of local extinctions of these taxa.

The following FFG-listed taxa are directly affected by the loss and removal of dead timber:

Bush Thick-knee, Grey-crowned Babbler, Spot-tailed Quoll      Turquoise Parrot, White-browed Treecreeper, Hooded Robin  
Carpet Python, Bandy Bandy      Rosenberg's Goanna, Brush-tailed Phascogale

In addition, two FFG-listed fauna communities are likely to be affected by the nominated process (Table 3)

**Additional Information**

- There is a large literature related to the loss of coarse woody debris and its affect on native flora and fauna (see references).
- The NSW Scientific Committee recently recommended for listing a similar process in that state (NSW Scientific Committee 2002).

**Table 1:** Victorian mammal and bird species affected by loss of coarse woody debris.  
(FFG-listed species underlined)

| Taxon                                                          | Current conservation status | Mature timber habitat use | Main habitat |
|----------------------------------------------------------------|-----------------------------|---------------------------|--------------|
| <b>Mammals</b>                                                 |                             |                           |              |
| Agile Antechinus <i>Antechinus agilis</i>                      | S                           | F                         | R,D          |
| Yellow-footed Antechinus <i>Antechinus flavipes</i>            | S                           | F                         | W,D          |
| <u>Western Quoll</u> <i>Dasyurus geoffroyi</i>                 | X                           | F                         | M,R          |
| <u>Spot-tailed Quoll</u> <i>Dasyurus maculatus</i>             | E                           | F                         | W            |
| <u>Eastern Quoll</u> <i>Dasyurus viverrinus</i>                | X                           | F                         | D,R,W,G      |
| <u>Red-tailed Phascogale</u> <i>Phascogale calura</i>          | X                           | O                         | M            |
| <u>Brush-tailed Phascogale</u> <i>Phascogale tapoatafa</i>     | V                           | O                         | D,W,R        |
| Western Pigmy-Possum <i>Cercartetus concinnus</i>              | S                           | F                         | M            |
| Little Pigmy-Possum <i>Cercartetus lepidus</i>                 | S                           | F                         | M            |
| Eastern Pigmy-Possum <i>Cercartetus nanus</i>                  | S                           | F                         | W            |
| Southern Freetail Bat <i>Mormopterus</i> sp. (long penis form) | S                           | O                         | D,G,M,R      |
| Inland Freetail Bat <i>Mormopterus</i> sp. (short penis form)  | S                           | O                         | D,G,M,R      |
| Eastern Freetail Bat <i>Mormopterus</i> sp. (eastern form)     | S                           | O                         | D,G,M,R      |
| White-striped Freetail Bat <i>Tadarida australis</i>           | S                           | O                         | D,G,M,R,W    |
| Gould's Wattled Bat <i>Chalinolobus gouldii</i>                | S                           | F                         | D,G,M,W      |
| Chocolate Wattled Bat <i>Chalinolobus morio</i>                | S                           | F                         | D,M,W        |
| Inland Forest Bat <i>Vespadelus baverstocki</i>                | S                           | F                         | M            |
| Large Forest Bat <i>Vespadelus darlingtoni</i>                 | S                           | F                         | D,W          |
| Southern Forest Bat <i>Vespadelus regulus</i>                  | S                           | F                         | D,M,R,W      |
| Little Forest Bat <i>Vespadelus vulturinus</i>                 | S                           | F                         | D,M,R,W      |
| Eastern False Pipistrelle <i>Falsistrellus tasmaniensis</i>    | S                           | O                         | D,R,W        |
| Large-footed Myotis <i>Myotis macropus</i>                     | NT                          | F                         | R            |
| Lesser Long-eared Bat <i>Nyctophilus geoffroyi</i>             | S                           | F                         | D,G,M,R,W    |

|                                                        |    |      |       |
|--------------------------------------------------------|----|------|-------|
| Gould's Long-eared Bat <i>Nyctophilus gouldi</i>       | S  | O    | D,W   |
| Greater Long-eared Bat <i>Nyctophilus timoriensis</i>  | V  | O    | M     |
| Inland Broad-nosed Bat <i>Scotorepens balstoni</i>     | S  | O    | D,M   |
| Little Broad-nosed Bat <i>Scotorepens greyii</i>       | DD | O    | D     |
| Eastern Broad-nosed Bat <i>Scotorepens orion</i>       | S  | O    | W     |
| <b>Birds</b>                                           |    |      |       |
| Turquoise Parrot <i>Neophema pulchella</i>             | NT | O    | D,G   |
| Hooded Robin <i>Melanodryas cucullata</i>              | NT | F(i) | D,G   |
| Crested Bellbird <i>Oreoica gutturalis</i>             | NT | F(i) | D,M   |
| Chestnut-rumped Thornbill <i>Acanthiza uropygialis</i> | V  | O    | D,M   |
| Buff-rumped Thornbill <i>Acanthiza reguloides</i>      | S  | F    | D,G   |
| Southern Whiteface <i>Aphelocephala leucopsis</i>      | S  | O    | G,M   |
| Red-browed Treecreeper <i>Climacteris erythroptis</i>  | S  | O(r) | W     |
| White-browed Treecreeper <i>Climacteris affinis</i>    | V  | O    | M     |
| Brown Treecreeper <i>Climacteris picumnus</i>          | S  | O(r) | D,G,R |
| Bush Thick-knee                                        | E  | O(r) | G     |
| Speckled Warbler                                       | V  | O    | D,G   |
| Brown Treecreeper                                      | NT | O    | D,G   |
| Apostlebird                                            | -  | F    | D,G,M |
| Spotted Quail-thrush                                   | NT | O(r) | D     |
| Chestnut-rumped Heathwren                              | V  | O(r) | D     |
| Gilbert's Whistler                                     | -  | F    | D,G   |
| Jacky Winter                                           | -  | F    | D,G   |
| Red-capped Robin                                       | -  | O    | D,G   |
| Diamond Dove                                           | NT | O    | D,G   |
| Brown Quail                                            | NT | O(r) | D     |
| Painted Button-quail                                   | -  | O(r) | D     |

**Table codes**

**Conservation Status** (in Victoria, source NRE 2000): X=Extinct, E=Endangered, V=Vulnerable, NT=Near Threatened, DD=Data Deficient, S=Secure.

**Mature timber habitat (MTH) Use:** O=Obligatory, F=Facultative, (i)=infrequent, (r)=both roosts and breeds (birds only); Some of the species marked O will also use holes in rocks, caves or buildings when available.

**Habitat** (main habitat where hollow-bearing tree used): D=Dry Forest, G=Grassy Woodland (including open farmland with scattered trees), M=Mallee, R=Riparian River Red Gum Forest/Woodland, W=Wet Forest.

| Common name                 | Scientific name                    | Common name                  | Scientific name                        |
|-----------------------------|------------------------------------|------------------------------|----------------------------------------|
| Eastern Three-lined Skink   | <i>Bassiana duperreyi</i>          | Highland Copperhead          | <i>Austrelaps ramsayi</i>              |
| Red-throated Skink          | <i>Bassiana plalyronum</i>         | Lowland Copperhead           | <i>Austrelaps superbus</i>             |
| Southern Rainbow Skink      | <i>Carlia tetradactyla</i>         | White-lipped Snake           | <i>Drysdalia coronoides</i>            |
| Carnaby's Wall Skink        | <i>Cryptoblepharus carnabyi</i>    | Red-bellied Black Snake      | <i>Pseudechis porphyriacus</i>         |
| <u>Alpine She-oak Skink</u> | <i>Cyclodomorphus praealtus</i>    | Eastern Brown Snake          | <i>Pseudonaja textilis</i>             |
| Tree Skink                  | <i>Egernia striolata</i>           | Common Scaly-foot            | <i>Pygopus lepidopodus</i>             |
| White's Skink               | <i>Egernia whitii</i>              | Gray's Blind Snake           | <i>Ramphotyphlops nigrescens</i>       |
| Yellow-bellied Water Skink  | <i>Eulamprus heatwolei</i>         | Eastern Small-eyed Snake     | <i>Rhinoplocephalus nigrescens</i>     |
| <u>Alpine Water Skink</u>   | <i>Eulamprus kosciuskoi</i>        | Little Whip Snake            | <i>Suta flagellum</i>                  |
| Eastern Water Skink         | <i>Eulamprus quoyii</i>            | <u>Carpet Python</u>         | <i>Morelia spilota mectalfei</i>       |
| Southern Water Skink        | <i>Eulamprus tympanum tympanum</i> | <u>Bandy Bandy</u>           | <i>Vermicella annulata</i>             |
| Three-toed Skink            | <i>Hemiergus decresiensis</i>      | Tree Dragon                  | <i>Amphibolurus muricatus</i>          |
| Bougainville's Skink        | <i>Lerista bougainvillii</i>       | Olive Legless Lizard         | <i>Delma inornata</i>                  |
| Grey's Skink                | <i>Menetia greyii</i>              | Wood Gecko                   | <i>Diplodactylus vittatus</i>          |
| Boulenger's Skink           | <i>Morethia boulengeri</i>         | Gippsland Water Dragon       | <i>Physignathus lesueurii howittii</i> |
| McCoy's Skink               | <i>Nannoscincus maccoyi</i>        | Eastern Bearded Dragon       | <i>Pogona barbata</i>                  |
| Coventry's Skink            | <i>Niveoscincus coventryi</i>      | Mountain Dragon              | <i>Tympanocryptis diemensis</i>        |
| Metallic Skink              | <i>Niveoscincus metallicus</i>     | Blotched Blue-tongued Lizard | <i>Tiliqua nigrolutea</i>              |
| Southern Grass Skink        | <i>Pseudemoia entrecasteauxii</i>  | Common Blue-tongued Lizard   | <i>Tiliqua scincoides</i>              |
| Spencer's Skink             | <i>Pseudemoia spenceri</i>         | <u>Rosenberg's Goanna</u>    | <i>Varanus rosenbergi</i>              |
|                             |                                    | Tree Goanna                  | <i>Varanus varius</i>                  |

**Table 2:** Victorian reptile taxa utilising microhabitats such as logs (adapted from Lindenmayer *et al.* 2002, FFG-listed taxa underlined)

At least two FFG-listed communities (Table 3) are threatened by the loss of coarse woody debris.

|    | Community                                   | Nomination no. |
|----|---------------------------------------------|----------------|
| 1. | Victorian Temperate-woodland Bird Community | 512            |
| 2. | Victorian Mallee Bird Community             | 557            |

**Table 3:** FFG-listed communities threatened by the removal and loss of dead timber  
(source: SAC 2000, 2002)

### Advertisement for public comment

In accordance with the requirements of Section 14 of the **Flora and Fauna Guarantee Act 1988**, the preliminary recommendation was advertised for a period of at least 30 days.

The preliminary recommendation was advertised in:

'The Age' - on 26 February 2003

'The Weekly Times' - on 26 February 2003

The *Government Gazette* - on 27 February 2003

Submissions closed on 31 March 2003.

### Further evidence provided:

Two submissions were received but no evidence was provided to warrant a review of the Scientific Advisory Committee's preliminary recommendation that the potentially threatening process is eligible for listing.

### Documentation

The published information provided to the SAC has been assessed. Based on the available evidence, the SAC believes that the data presented are not the subject of scientific dispute and the inferences drawn are reasonable and well supported.

### Final Recommendation of the Scientific Advisory Committee

The Scientific Advisory Committee concludes that on the evidence available the nominated item is eligible for listing in accordance with Section 11 of the Act because primary criterion 5.1 has been satisfied. The SAC also concludes that sub-criteria 5.1.1 has been satisfied and that no evidence exists to suggest that primary criterion 5.1 cannot be satisfied as a consequence of sub-criteria 5.1.1 being satisfied.

The Scientific Advisory Committee recommends that the nominated item be supported for listing on Schedule 3 of the **Flora and Fauna Guarantee Act 1988**.

### Selected references:

- Andrew, N., Rogerson, L. & York, A. (2000) Frequent fuel-reduction burning: the role of logs and associated leaf litter in the conservation of ant biodiversity. *Austral Ecology* **25**: 99-107.
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- Grove, S. J. (2001) Developing appropriate mechanisms for sustaining mature timber habitat in managed natural forest stands. *International Forestry Review* 3 (4): 272-284.
- (2002a) Tree basal area and dead wood as surrogate indicators of saproxylic insect faunal integrity: a case study from the Australian lowland tropics. *Ecological Indicators* 1 (3): 171-188.
- (2002b) The influence of forest management history on the integrity of the saproxylic beetle fauna in an Australian lowland tropical rainforest. *Biological Conservation* 104: 149-171.
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- (1997b) Final Recommendation on a nomination for listing: Grey Box - Buloke Grassy Woodland Community (Nomination no. 434). Scientific Advisory Committee, Flora and Fauna Guarantee. Department of Natural Resources and Environment: Melbourne.
- (2000) Final Recommendation on a nomination for listing: Victorian Temperate-woodland Bird Community (Nomination no. 512). Scientific Advisory Committee, Flora and Fauna Guarantee. Department of Natural Resources and Environment: Melbourne.
- (2002a) Final Recommendation on a nomination for listing: The spread of *Phytophthora cinnamomi* from infected sites into parks or reserves, including roadsides, under the control of a state or local government authority (Potentially Threatening Process) (Nomination no. 514). Scientific Advisory Committee, Flora and Fauna Guarantee. Department of Natural Resources and Environment: Melbourne.
- (2002b) Final Recommendation on a nomination for listing: Victorian Mallee bird Community (Nomination no. 557). Scientific Advisory Committee, Flora and Fauna Guarantee. Department of Natural Resources and Environment: Melbourne.

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**Relevant websites:**

- Australian Greenhouse Office, *Decay of Coarse woody debris* (report) –  
<http://www.greenhouse.gov.au/ncas/reports/tech06.html>
- Coarse woody debris in the Brigalow (Qld) - <http://www.env.qld.gov.au/environment/science/wildlife/fera/coarsewoody.html>
- Ecological significance of coarse woody debris on south-eastern Australian floodplains –  
<http://www-personal.monash.edu.au/~dacelo/pdf/R7007.I.pdf>
- Impact & use of firewood in Australia - <http://www.recycledfuels.com.au/impact.asp>

**Endorsement by the Convenor of the Scientific Advisory Committee****Date**

4/4/03



**Dr Michael Clarke**  
**Convenor**