NSW SCIENTIFIC COMMITTEE

Final Determination

The Scientific Committee, established by the Threatened Species Conservation Act, has made a Final Determination to list the Mount Kaputar high elevation and dry rainforest land snail and slug community in the Nandewar and Brigalow Belt South Bioregions, as an ENDANGERED ECOLOGICAL COMMUNITY in Part 3 of Schedule 1 of the Act. Listing of Endangered Ecological Communities is provided for by Part 2 of the Act.

The Scientific Committee has found that:

1. Mount Kaputar high elevation and dry rainforest land snail and slug community in the Nandewar and Brigalow Belt South Bioregions is the name given to the ecological community which is naturally restricted to the higher altitudes (above about 1000 m) and dry rainforest (including semi-evergreen vine thicket) areas at lower elevations (above 500 m) in and around Mount Kaputar. The community is characterised by the species assemblage listed in paragraph 2. These bioregions are as defined by IBRA 7. A map of this version of the Interim Biogeographic Regionalisation of Australia is available at:
   http://www.environment.gov.au/parks/nrs/science/bioregion-framework/ibra/maps.html

2. Mount Kaputar high elevation and dry rainforest land snail and slug community in the Nandewar and Brigalow Belt South Bioregions is characterised by the following assemblage of native species, some of which are endemic to the community:

   Snails
   Austrochloritis kaputarensis (isolated population at Mount Kaputar)
   Coenocharopa 'Mt Kaputar' (endemic to community)
   Cralopa kaputarensis (endemic to community)
   Discocharopa stenomphala (isolated population)
   Kaputarenesta nandewarensis (isolated population)
   Scelidoropa nandewar (endemic to community)
   Thersites sp. 1 (endemic to community)
   Vitellidelos kaputarensis (endemic to community)

   Slug
   Triboniophorus aff. graeffei (morphologically distinct population at Mount Kaputar, likely endemic)

3. The total species list of the community is considerably larger than that given above, including a range of other native snail taxa that are more widespread and/or occur down to lower elevations (*e.g. Diphyoropa* 'Nandewar'; *Austrorhytida nandewarensis*; *Brevisentis kaputarensis*). The species composition of a site will be influenced by its disturbance (including fire) history. The species listed above are land snail and slug species; the community also includes vascular and non-vascular plants, micro-organisms, fungi, cryptogamic plants and a diverse fauna, both vertebrate and other invertebrates.

4. The Mount Kaputar high elevation and dry rainforest land snail and slug community in the Nandewar and Brigalow Belt South Bioregions occurs in the vicinity of Mount Kaputar. The species assemblage found at Mount Kaputar is distinct from other snail and slug communities with respect to its species composition and has a high level of endemism (F. Köhler pers. comm. Nov. 2011; J. Stanisic pers. comm. Nov. 2011). Mount Kaputar has the highest number of endemic snail species of all the high elevation refugial areas on the western side of the Great Dividing Range in NSW. The Community includes a spectacular but undescribed athoracophorid slug which is the most westerly record from the family in Australia and the only member of this family found on the western side of the Great Dividing Range (M. Shea pers. comm. Nov. 2011). Snail assemblages in other high-altitude regions

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are largely composed of different snail and slug species, with some overlap of a few widely-distributed taxa (F. Köhler pers. comm. Nov. 2011).

5. Dominant trees associated with the Mount Kaputar high elevation and dry rainforest land snail and slug community in the Nandewar and Brigalow Belt South Bioregions include Snow Gum (*Eucalyptus pauciflora*), Ribbon Gum (*E. viminalis*), Mountain Gum (*E. dalrympleana*), Rough-barked Mountain Gum (*E. volcanica*), Silvertop Stringybark (*E. laevopinea*) and Red Stringybark (*E. macrorhyncha*). The vegetation assemblages containing these dominant trees have been described by Hunter and Alexander (2000) and Porteners (1997; 1998) as follows: New England Blackbutt - Stringybark Open Forests (Community 5, Hunter and Alexander 2000), Stringybark – New England Blackbutt Open Forests (Community 6, Hunter and Alexander 2000), Mountain Gum – Ribbon Gum Open Forests (Community 7, Hunter and Alexander 2000), Snow Gum, Ribbon Gum and Mountain Gum (Community 1, Porteners 1997), Silver-Top Stringybark and Rough-Barked Mountain Gum (Community 2, Porteners 1998). Mount Kaputar high elevation and dry rainforest land snail and slug community in the Nandewar and Brigalow Belt South Bioregions can also occur in other non-eucalypt dominated vegetation assemblages including *Kunzea* sp. - Tea Tree (*Leptospermum polygalifolium*) wet heath on high elevation rocky outcrops (Hunter and Alexander 2000) and dry rainforest (including semi-evergreen vine thicket) down to about 500 m. The dry rainforest (*sensu* Curran *et al.* 2008) in the Mt Kaputar area includes both dry rainforest and vine thickets and falls in the Dry Rainforest class of Keith (2004) and some areas of Western Vine Thickets (Keith 2004). It includes the dry rainforest parts of unit 10 'River Oak Riparian Forest with Dry Rainforest' (Porteners 1998) and unit 1 'River Oak Riparian Forests' (Hunter & Alexander 2000). The Mount Kaputar high elevation and dry rainforest land snail and slug community in the Nandewar and Brigalow Belt South Bioregions tends to occur in favourable habitat with low average temperatures, high precipitation and high humidity, resulting in favourable moisture conditions for the land snails and slugs.

6. Mount Kaputar high elevation and dry rainforest land snail and slug community in the Nandewar and Brigalow Belt South Bioregions has a highly restricted geographic distribution. Whilst it is known from areas of elevation higher than 1000 m in the Mount Kaputar area, the community also has a limited occurrence outside this high elevation area, occurring in dry rainforest in topographic micro-climatic refugia at lower elevations in the Mount Kaputar area down to 500 m. The extent of occurrence (EOO) is estimated to be between 1700 – 2300 km^2, and is based on a minimum convex polygon enclosing all likely occurrences of the community, the method of assessment recommended by IUCN (2011). This estimate included likely occurrences in the Mount Kaputar area within Mount Kaputar National Park, all areas above 1000 m altitude in the vicinity of Mount Kaputar, and all areas >500 m altitude in the surrounding area (thought to encompass all or most areas of the dry rainforest habitat in the Mt Kaputar area). The area of occupancy (AOO) is 392 km^2, based on 98 2x2 km grid cells over known areas of the community's habitat, the scale recommended for assessing area of occupancy by IUCN (2011). It includes all areas higher than 1000 m elevation in the Mount Kaputar area, and those known areas of dry rainforest outside the 1000 m elevation area. This may slightly underestimate AOO if there are additional small patches of dry rainforest habitat scattered in the Mount Kaputar area down to about 500 m. The total dry rainforest habitat is highly fragmented and thought to total less than 100 ha.

7. Mount Kaputar high elevation and dry rainforest land snail and slug community in the Nandewar and Brigalow Belt South Bioregions is threatened by anthropogenic climate change. Laurance *et al.* (2011) highlighted restricted mountain ecosystems as inherently susceptible to climate change because of their often narrow environmental envelope, geographically restricted distribution and proximity to climatic thresholds. Many Australian land snail and slug species are known to be narrow-range endemics, which is attributed to their limited ability to disperse in combination with comparatively low ecological tolerance (F. Köhler pers. comm. Nov. 2011). The endemic species that are restricted to the moist refugia of higher elevations in the Mount Kaputar area are of particular concern. These species have evolved from lowland ancestors and have been isolated in an otherwise

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snail-hostile environment as conditions began to dry (J. Stanisic pers. comm. Nov. 2011). As a result they are acutely susceptible to the modifications in habitat structure and distribution that are likely to occur in the future (*e.g.* changed fire regime, altered rainfall patterns and temperatures; F. Köhler pers. comm. Nov. 2011). 'Anthropogenic Climate Change' is listed as a Key Threatening Process under the *Threatened Species Conservation Act* 1995.

8. Mount Kaputar high elevation and dry rainforest land snail and slug community in the Nandewar and Brigalow Belt South Bioregions is also threatened by the invasion and establishment of exotic species, such as feral pigs (*Sus scrofa*) and Black Rats (*Rattus rattus*) (J. Stanisic pers. comm. Nov. 2011). Feral pigs, in particular, cause habitat disturbance when digging-up soil and leaf litter, trampling vegetation, and turning over logs and rocks. Feral pigs significantly reduce litter cover on forest floors and can be responsible for short-term and long-term reductions in the density of macroinvertebrates (Taylor *et al.* 2011). 'Predation, habitat degradation, competition and disease transmission by Feral Pigs, *Sus scrofa* Linnaeus 1758' is listed as a Key Threatening Process under the *Threatened Species Conservation Act* 1995.

9. Mount Kaputar high elevation and dry rainforest land snail and slug community in the Nandewar and Brigalow Belt South Bioregions is not eligible to be listed as a Critically Endangered Ecological Community.

10. Mount Kaputar high elevation and dry rainforest land snail and slug community in the Nandewar and Brigalow Belt South Bioregions is eligible to be listed as an Endangered Ecological Community as, in the opinion of the Scientific Committee, it is facing a very high risk of extinction in New South Wales in the immediate future, as determined in accordance with the following criteria as prescribed by the *Threatened Species Conservation Regulation* 2010:

Clause 18 Restricted geographic distribution of the ecological community
The ecological community's geographic distribution is estimated or inferred to be:
(b) highly restricted,
and the nature of its distribution makes it likely that the action of a threatening process could cause it to decline or degrade in extent or ecological function over a time span appropriate to the life cycle and habitat characteristics of the ecological community's component species.

Clause 19 Reduction in ecological function of the ecological community
The ecological community has undergone, is observed, estimated, inferred or reasonably suspected to have undergone or is likely to undergo within a time span appropriate to the life cycle and habitat characteristics of its component species:
(b) a large reduction in ecological function,
as indicated by any of the following:
(e) change in species composition,
(f) disruption of ecological processes,
(g) invasion and establishment of exotic species,
(h) degradation of habitat.

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Chairperson
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Proposed Gazettal date: 20/12/13
Exhibition period: 20/12/13 – 14/03/014

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