NSW SCIENTIFIC COMMITTEE

Final Determination

The Scientific Committee, established by the *Threatened Species Conservation Act 1995* (the Act), has made a Final Determination to list a population of the Greater Glider *Petauroides volans* (Kerr, 1792) in the Mount Gibraltar Reserve area as an ENDANGERED POPULATION in Part 2 of Schedule 1 of the Act. Listing of endangered populations is provided for by Part 2 of the Act.

The Scientific Committee has found that:

1. The Greater Glider *Petauroides volans* (Kerr, 1792) (family Pseudocheiridae) is not currently listed as an Endangered species in Part 1 of Schedule 1 or a Critically Endangered species in Part 1 of Schedule 1A and as a consequence populations of this species are eligible to be listed as Endangered populations. A population of the Greater Glider in the Eurobodalla Local Government Area (LGA) is currently listed as Endangered. The species is not listed under the *Environment Protection and Biodiversity Conservation Act* 1999.

2. A population of Greater Gliders is located in the Mount Gibraltar Reserve area, on the northern edge of Bowral in the Southern Highlands, and covers a total area of around 200 ha. It encompasses Mount Gibraltar Reserve (139 ha), a bushland reserve under the control of Wingecarribee Shire Council, and surrounding areas of freehold land supporting native forest with a continuous canopy that is contiguous with Mt Gibraltar Reserve. The boundaries to the population are the township of Bowral to the south, a railway line, Bowral Road and the township of Mittagong to the north, urban backyards and semi-cleared farmland to the east and urban backyards, Mittagong Road and Bowral Road to the north and northwest.

3. The Greater Glider is a large gliding marsupial with body length 350-450 mm, tail length 450-600 mm and weighing between 900 and 1700 g (Strahan 1995). The species is further described by Strahan (1995) as “dark grey, cream, mottled cream and grey or dusky brown above; whitish below. Long, furry tail, pale below and basal half. Snout short; very large ears. Tail not prehensile.”

4. Greater Gliders are solitary, usually monogamous, except in high density populations, and have a low reproductive rate relative to other arboreal marsupials, such as the Common Brushtail Possum (*Trichosurus vulpecula*) or Common Ringtail Possum (*Pseudocheirus peregrinus*) (Kerle 2001; Kavanagh & Wheeler 2004). A single young is born in late autumn to early winter and is independent at nine months of age. Age to first reproduction is two years (Kerle 2001). Individuals can live up to 15 years (Lindenmayer 1997), however average longevity is five years of age (R. Kavanagh pers. comm. August 2013).

5. The distribution of the Greater Glider covers the ranges and coastal plains of eastern Australia (from Central Victoria to around Cairns, Queensland), where it inhabits a variety of eucalypt forests and woodlands (Kavanagh 2004). Preferred habitat for the species is montane forest containing *Eucalyptus radiata* (Narrow-leaved Peppermint), *E. viminalis* (Manna Gum) and *E. fastigata* (Brown Barrel). Other species may include *E. obliqua* (Messmate), *E. ovata* (Swamp Gum) and *E. cypellocarpa* (Mountain Grey Gum) (Kavanagh & Lambert 1990; R. Kavanagh pers comm. August 2013). Greater Gliders are folivores, feeding almost exclusively on the young leaves and flower buds of select eucalypt species, in particular *E. radiata*, *E. viminalis* and *E. acmenoides* (White Mahogany) (Kavanagh & Lambert 1990).

Contact Address: C/o PO Box 1967 Hurstville BC NSW 1481 Telephone: (02) 9585 6940 Facsimile: (02) 9585 6606

6. Greater Gliders shelter during the day in hollows that are usually positioned high in old trees. Individual animals utilise between one and seven den trees, ranging from 71–193 cm diameter at breast height (Kavanagh & Wheeler 2004). During the night, movements are primarily restricted to gliding between trees. When gliding, they can cover distances up to 100 m (Kerle 2001) but usually tend not to glide further than 30 m and have a steeper trajectory than other species of glider (R. Kavanagh pers. comm. August 2013). Greater Gliders are not known to venture to the ground as their gait is awkward and clumsy, making them easy prey (Strahan 1995). Individuals appear to use the same routes repeatedly as they move from hollows to feeding areas (Kerle 2001) and occupy relatively small home ranges (average 1 to 3 ha) from which they rarely disperse (Kavanagh and Wheeler 2004). Males tend to occupy larger home ranges than females and home range size appears to increase in smaller patches and at lower population densities (Pope *et al*. 2004).

7. Within Mount Gibraltar Reserve, Greater Gliders have been located in Brown Barrel Tall Forest; a large component of which forms part of the Mount Gibraltar Forest in the Sydney Basin Bioregion Endangered Ecological Community (EEC). The Greater Glider is also found in River Peppermint Tall Forest (comprising River Peppermint *E. elata* and Gully Gum *E. smithii*) in the northeast and Manna Gum Tall Forest on the lower western edge. Most of the western section of the reserve contains large outcrops of syenite rock including some tall cliffs and is unlikely to contain suitable habitat for Greater Gliders (KMA 2004; BES 2008). On the basis of available vegetation mapping (KMA 2004) and fauna survey results (BES 2008), it is estimated that approximately 60% of Mount Gibraltar Reserve contains habitat suitable for Greater Gliders.

8. Mount Gibraltar Reserve is largely surrounded by residential development with limited connectivity to other areas of suitable Greater Glider habitat. A potential corridor exists to the adjacent Gibbergunyah Reserve (approximately 1 km to the west) where a small number of tall trees (<50) line either side of a 10–15 m section of Mittagong Rd. Gibbergunyah Reserve is known to support Greater Gliders (KMA 2004), however in order to pass between the two reserves Greater Gliders would have to travel through less suitable habitat in the western section of Mount Gibraltar Reserve (see paragraph 7), including utilising trees in urban backyards, before gliding across Mittagong Rd. Given the species prefers continuous canopy and is known to avoid open areas and urban backyards (Kerle 2001), Greater Gliders are considered unlikely to move between the reserves and the population is therefore considered disjunct.

9. The population occupies an isolated area of around 200 ha (i.e. 139 ha within Mount Gibraltar Reserve and 61 ha of non-reserved land). The extent of occurrence and area of occupancy (AOO) for the population are calculated at 8 km^2, based on two 2 x 2 km grid cells, the recommended for assessing AOO by IUCN (2014). The geographic distribution of the population is therefore considered to be highly restricted.

10. The number of mature individuals in the population is not known but can be loosely inferred from home range and population density studies of the species from elsewhere. Home range sizes for Greater Gliders vary from 1 to 3 ha, with overlap between individuals. In optimal habitat types, Greater Gliders can achieve population densities of 0.5–2.3 animals per ha. Based on these density values, a maximum theoretical population size of between 100 and 460 mature individuals might occur. However, given that only 60% of Mount Gibraltar Reserve is regarded as suitable habitat for Greater Gliders, and habitat quality across the area is poorly understood, the number of mature individuals is likely to be at the lower end of the estimated range. Spotlighting surveys in the reserve conducted in 2008, which aimed to provide baseline information about the distribution and

Contact Address: C/o PO Box 1967 Hurstville BC NSW 1481 Telephone: (02) 9585 6940 Facsimile: (02) 9585 6606

occurrence of native fauna, including the Greater Glider, found fewer than 15 adult Greater Gliders in Mount Gibraltar Reserve (BES 2008).

11. Greater Gliders in the Mount Gibraltar Reserve area are impacted by declining habitat quality. Past disturbances include quarrying of the Mount Gibraltar syenite and clearing of vegetation (BES 2008). Current impacts in the Reserve include exotic weed invasion. For example, the Mount Gibraltar Forest Endangered Ecological Community is threatened by species such as *Hedera helix* (Common Ivy), *Lonicera japonica* (Japanese Honeysuckle), *Ilex aquifolium* (Holly), *Berberis thunbergii* (Japanese Barberry), *Pyracantha angustifolia* (Orange Firethorn) and *Genista monspessulana* (Cape Broom) (NSW Scientific Committee 2001). Disturbances associated with localised clearing, movement of machinery and dumping of rubbish further impact habitat quality within the area occupied by the population. Mount Gibraltar Reserve itself is traversed by a tourist road (Oxley Drive) and several walking and management (vehicle) trails which are regularly used for recreational activities (BES 2008). On freehold land, clearing of vegetation and loss of hollow-bearing trees are ongoing threats leading to the loss of habitat and a reduction of already limited connectivity with adjacent areas.

12. Direct impacts on populations of this species include predation by Powerful Owls (*Ninox strenua*) (Kavanagh 1988), which may significantly suppress the population of Greater Gliders in the Mount Gibraltar Reserve area (BES 2008). Pressure from adjacent urban development, including predation and/or disturbance from domestic dogs and cats, rubbish dumping and noise are also likely to affect the population (BES 2008). In addition wildfires and other stochastic events are likely to adversely affect the population, given its small size and limited capacity to disperse.

13. The population of the Greater Glider *Petauroides volans* (Kerr, 1792) in the Mount Gibraltar Reserve area is eligible to be listed as an Endangered population as, in the opinion of the Scientific Committee, it is facing a very high risk of extinction in New South Wales in the near future as determined in accordance with the following criteria as prescribed by the *Threatened Species Conservation Regulation* 2010:

Clause 11

The population is facing a very high risk of extinction in New South Wales in the near future as, in the opinion of the Scientific Committee, it satisfies any one or more of the following paragraphs and also meets the criteria specified in one or more of the following clauses:

(a) it is disjunct or near the limit of its geographic range.

Clause 13

The geographic distribution of the population is estimated or inferred to be highly restricted and either:

(a) a projected or continuing decline is observed, estimated or inferred in either of the key indicators:
  (a) an index of abundance appropriate to the taxon, or
  (b) the geographic distribution, habitat quality or diversity, or genetic diversity of the population.

Contact Address: C/o PO Box 1967 Hurstville BC NSW 1481 Telephone: (02) 9585 6940 Facsimile: (02) 9585 6606

Clause 14
The estimated total number of mature individuals in the population is low and either:

(a) a projected or continuing decline is observed, estimated or inferred in either of the key indicators:
  (i) an index of abundance appropriate to the taxon, or
  (ii) the geographic distribution, habitat quality or diversity, or genetic diversity of the population.

Clause 15 Very low numbers of mature individuals in population
The estimated total number of mature individuals of the population is observed, estimated or inferred to be very low.

Dr Mark Eldridge
Chairperson
Scientific Committee

Exhibition period: 22/05/15 – 17/07/15 Proposed Gazettal date: 22/05/15

References:

Bushfire and Environmental Services (BES) (2008). Draft Fauna Survey for Mount Gibraltar Reserve, Bowral. Wingecarribee Shire Council

IUCN Standards and Petitions Subcommittee (2014) Guidelines for Using the IUCN Red List Categories and Criteria. Version 11. Prepared by the Standards and Petitions Subcommittee. http://www.iucnredlist.org/documents/RedListGuidelines.pdf.

Kavanagh RP (1988) The impact of predation by the powerful owl, *Ninox strenua*, on a population of the greater glider, *Petauroides volans*. *Australian Journal of Ecology* **13**, 445–450.

Kavanagh RP (2004) Distribution and conservation status of possums and gliders in New South Wales. In 'The biology of possums and gliders'. (Eds RL Goldingay, SM Jackson) pp. 130-148. (Surrey Beatty & Sons: Chipping Norton)

Kavanagh RP, Lambert M (1990) Food selection by the Greater Glider, *Petauroides volans*: Is foliar nitrogen a determinant of habitat quality. *Wildlife Research* **17**, 285–299.

Kavanagh RP, Wheeler RJ (2004) Home-range of the greater glider *Petauroides volans* in tall montane forest of southeastern New South Wales, and changes following logging. In 'The biology of possums and gliders'. (Eds RL Goldingay, SM Jackson) pp. 413–425. (Surrey Beatty & Sons: Chipping Norton)

Kerle JA (2001) 'Possums: The brushtails, ringtails and greater glider.' (UNSW Press: Sydney)

Kevin Mills & Associates (KMA) (2003) Ecological Investigation: Strategic Bushfire Management Plan for Mount Gibraltar Reserve, Gibbergunyah Reserve and Mount Alexendra Reserve. Report for Wingecarribee Shire Council

Contact Address: C/o PO Box 1967 Hurstville BC NSW 1481 Telephone: (02) 9585 6940 Facsimile: (02) 9585 6606

Kevin Mills & Associates (KMA) (2004) Wingecarribee Shire Council Fire Management Plan. Wingecarribee Shire Council

Lindenmayer DB (1997) Differences in the Biology and Ecology of Arboreal Marsupials in Forests of Southeastern Australia. *Journal of Mammalogy* **78**, 1117–1127.

NSW Scientific Committee (2001) Greater Glider *Petauroides volans* population in the Eurobodalla Local Government Area. Final Determination to list an endangered population under the *Threatened Species Conservation Act* 1995. NSW Scientific Committee, Sydney. http://www.environment.nsw.gov.au/determinations/GreaterGliderEndPop.htm

Pope ML, Lindenmayer DB, Cunningham RA (2004) Patch use by the greater glider (*Petauroides volans*) in a fragmented forest ecosystem. I. Home range size and movements. *Wildlife Research* **31**, 559–568.

Strahan R (1995) 'The mammals of Australia' (Reed Books: Sydney)

Contact Address: C/o PO Box 1967 Hurstville BC NSW 1481 Telephone: (02) 9585 6940 Facsimile: (02) 9585 6606