Advice to the Minister for Sustainability, Environment, Water, Population & Communities from the Threatened Species Scientific Committee (the Committee) on Amendments to the List of Key Threatening Processes under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)

1. Name and description of the threatening process

'Aggressive exclusion of birds from potential woodland and forest habitat by over-abundant noisy miners (*Manorina melanocephala*)'

The Committee wishes to highlight that the threat posed by *Manorina melanocephala* (noisy miners) is related to a broader threat, being land clearance and habitat fragmentation. Where habitat is extensive and close to its natural state, the effect of Noisy miners on other bird species is reduced. Consequently, it is important in reading this advice, and in subsequent attempts to abate the noisy miner threat, to bear in mind that the noisy miner is a native species and has its place in a healthy landscape. Thus, abatement of the threats posed by over-abundant noisy miners is a last resort, designed primarily to maintain values in native vegetation remnants that have been already been degraded by other processes.

The noisy miner is a sedentary honeyeater species native to the woodlands and open forests of eastern Australia from far north Queensland to Tasmania (Barrett et al. 2003). It is a very common species (often comprising more than 50% of all birds present) in both fragmented and uncleared woodland and open forest landscapes (Loyn 1987; Clarke and Oldland 2007; Maron and Kennedy 2007; Mac Nally et al. 2012), as well as urban areas (Catterall et al. 2002; Piper and Catterall 2003; Parsons et al. 2006). Noisy miners are increasing in abundance, but not necessarily in range. In the period between the publication of the first (Blakers et al. 1984) and second (Barrett et al. 2003) Australian bird atlases, the reporting rate of the noisy miner increased by 10% Australia-wide, and independent analyses suggest they have become more common in south-east Queensland since the 1960s (Szabo et al. 2010).

Noisy miners live in large colonies. Birds within colonies cooperate (particularly among sub-groups within the colony, called coteries (Dow 1979)) to defend the area occupied by the colony against almost all other bird species (Dow 1977). They achieve this territory defence through aggressive behaviour, physically attacking most other birds. Groups of noisy miners usually cooperate in mounting these attacks, and through this behaviour, noisy miners are able to exclude almost all passerine (perching) birds that are similar in size or smaller than themselves (mass ~60 g) (Dow 1977). These behaviours can have a disproportionately higher impact in small woodland fragments, because other bird species are successfully excluded.

The causal link between the presence of a noisy miner colony and effects on the remainder of the bird assemblage has been established through many separate studies. Experimental, statistical and observational approaches consistently conclude that the negative effect of noisy miners on smaller birds is causal (Dow 1977; Grey et al. 1997, 1998; Piper and Catterall 2003; Debus 2008; Eyre et al. 2009; Howes and Maron 2009; Kath et al. 2009). For example, removal of noisy miners from woodland patches generally results in influxes of small woodland birds, even without any change to habitat structure or condition. The removal of noisy miners from seven small (<10 ha) Box-Ironbark woodland remnants in north-eastern Victoria
(Grey et al. 1997, 1998) resulted in a major influx of small insectivorous birds, including the endangered *Anthochaera phrygia* (regent honeyeater) and numerous members of the Temperate Woodland Bird Community (listed as threatened in Victoria) such as *Melithreptus gularis* (black-chinned Honeyeater), *Lichenostomus fusca* (fuscous honeyeater), and small insectivores like *Artamus cyanopterus* (dusky woodswallow), *Aphelocephala leucopsis*

(southern whiteface) and *Daphoenositta chrysoptera* (varied sittella) (Flora and Fauna Guarantee – Scientific Advisory Committee 2001; Department of Primary Industries and Water 2006). This effect is reported consistently from trial management sites and unsanctioned culls (Debus 2008).

Where noisy miners are present, they physically and numerically dominate the avifauna, and the effect of noisy miner presence on other birds is substantially greater than the effects of other recognized threats such as grazing or habitat removal in the surrounding landscape (Maron et al. 2011). A review of studies from Central Queensland to Victoria that investigated the effects of habitat modification, landscape change and/or noisy miners on bird assemblages in remnant woodland found that the most consistently reported finding is a strongly negative effect of noisy miners (Maron et al. 2011). This effect was found more consistently than were effects of patch area, isolation, habitat structure, or grazing. Noisy miners are suggested to be one of the most significant threats to bird assemblages in woodland fragments in eastern Australia (Maron et al. 2011). However, Maron et al. (2011) were careful to highlight that the overall declines in woodlands birds are not necessarily wholly caused by noisy miners. Rather, the principal factor in the declines is the loss of most woodland habitat, but in this current modified landscape noisy miners are able to operate as a threatening process.

2. How judged by the Committee in relation to the EPBC Act criteria

Section 188(4) of the EPBC Act states:

A threatening process is eligible to be treated as a key threatening process if:

a) it could cause a native species or an ecological community to become eligible for listing in any category, other than conservation dependent; or

b) it could cause a listed threatened species or a listed threatened ecological community to become eligible to be listed in another category representing a higher degree of endangerment; or

c) it adversely affects 2 or more listed threatened species (other than conservation dependent species) or 2 or more listed threatened ecological communities.

A. Could the threatening process cause a native species or an ecological community to become eligible for listing as Extinct, Extinct in the Wild, Critically Endangered, Endangered or Vulnerable?

The noisy miner has negative effects on a wide range of species, as outlined above. Three species are included as examples because the recent Action Plan for Australian Birds 2010 (Garnett et al. 2010) considered them to be Near Threatened, and explicitly included noisy miners amongst the threats to these species. The descriptions of each subspecies also noted that the impacts of noisy miners are exacerbated by habitat fragmentation. The estimated declines cited below for each species are the result of multiple factors of which the noisy miner is but one. The noisy miner is not the sole cause of those declines, but may contribute to the species becoming eligible for listing if its influence increases or if it continues to exert that effect while other threats increase.

- *Melanodryas cucullata cucullata* (hooded robin) – more likely to occur in sites without noisy miners (Maron 2007). Decline estimated at 20-29% over the last three generations (Garnett et al., 2010).
- *Climacteris picumnus victoriae* (brown treecreeper) – more likely to occur in sites without noisy miners (Maron 2007). Decline estimated at 20-29% over the last three generations (Garnett et al., 2010).
- *Melithreptus gularis gularis* (black-chinned honeyeater) – absent from larger areas of

habitat where it would be expected (Major et al. 2001) but in another study observed only after removal of noisy miners (Grey et al. 1997). Decline estimated at 20-29% over the last three generations (Garnett et al., 2010).

A number of ecological communities may be affected by noisy miners. In some cases this may be direct. For example, the Victorian Government listed the 'Victorian temperate-woodland bird community' under the Flora and Fauna Guarantee Act (FFG Act) in 2001 (Flora and Fauna Guarantee – Scientific Advisory Committee 2001). A 2011 decision to include noisy miners as a threatening process under the FFG Act noted their potential to pose a risk to all bird species in the Victorian temperate-woodland bird community, and thus to the community itself (Flora and Fauna Guarantee – Scientific Advisory Committee 2011).

More indirect effects of noisy miners on ecological communities may arise through the miners' exclusion of insectivorous bird species. Without these species, the abundance of leaf eating insects tends to increase, leading to defoliation. A causal relationship is indicated by the removal of noisy miners from habitat patches and the subsequent recovery of foliage and overall health of previously defoliated trees (Clarke and Grey 2010). This is discussed in greater detail under Criterion C below (woodland communities).

Conclusion: The Committee considers that the threatening process is **eligible** under this criterion as the process is likely to cause a native species (e.g. hooded robin, brown treecreeper, black-chinned honeyeater) or an ecological community (e.g. the Victorian temperate-woodland bird community) to become eligible for listing as Vulnerable.

B. Could the threatening process cause a listed threatened species or a listed threatened ecological community to become eligible to be listed in another category representing a higher degree of endangerment?

Regent honeyeater (*Anthochaera phrygia*)

The regent honeyeater is listed as Endangered under the EPBC Act. The Action Plan for Australian Birds 2010 (Garnett et al. 2010) recommends revising the species' status to Critically Endangered and cites noisy miners as one of the threats to the species.

The noisy miner has been recorded excluding Regent Honeyeaters from woodland remnants (Grey et al. 1997), and as a result it is listed as a threat requiring management in the 1999–2003 recovery plan (Menkhorst et al. 1999) and current draft recovery plan (Geering and Ingwersen in prep). The regent honeyeater is a rich patch nomad, and the loss and fragmentation of habitats may have blurred the distinctiveness of honeyeater niches so that several species now congregate on remaining fragments, more than they would have done originally. This congregation of several species may lead to regent honeyeaters spending a disproportionate amount of time defending nectar sources, or ultimately being displaced from suitable habitat (Franklin et al. 1989; Garnett and Crowley 2000). In one study it was found that of 68 aggressive interactions between regent honeyeaters and other species of honeyeaters, most (56%) were with red wattlebirds, noisy friarbirds and noisy miners, and most of the interactions involved aggression directed towards regent honeyeaters (Franklin et al. 1989).

Further to this, regent honeyeaters may no longer reach sufficient numbers in nesting aggregations to share the effort of excluding other birds, in particular noisy miners, Noisy Friarbirds and lorikeets (Ford et al. 1993) and as a result sub-optimal breeding outcomes are likely. For example, at Chiltern in Victoria in 1999, a noisy miner was observed destroying a regent honeyeater nest and succeeded in driving the birds away from the area. Two nests with eggs deserted were found, and Noisy Friarbirds and other honeyeaters began feeding there (Collins, pers. obs., 1999). Ford et al., (1993) noted that competition between regent

honeyeaters and other nectar feeders was significant in high quality habitat, but in degraded habitat competition was particularly with noisy miners. This reiterates the point that noisy miners as a threatening process are significant, but only become so where habitat has been lost or degraded due to other factors.

Conclusion: The Committee considers that the threatening process is **eligible** under this criterion as the process is likely to cause a native species (regent honeyeater) to become eligible for listing as Critically Endangered.

C. Does the threatening process adversely affect two or more listed threatened species (other than conservation dependent species) or two or more listed threatened ecological communities?

Forty-spotted pardalote (*Pardalotus quadragintus*)

The forty-spotted pardalote is listed as Endangered under the EPBC Act.

The forty-spotted pardalote is sensitive to habitat fragmentation or disturbance (Woinarski and Bulman 1985; Brown 1986; Bryant 1991) and this has been suggested to make it more vulnerable to the effects of noisy miners through competition for food resources. Noisy miners are absent from all known colonies of the forty-spotted pardalote and all recent extinctions have been associated with the invasion of the species' habitat by noisy miners (Department of Primary Industries and Water 2006). A causal role of noisy miners in the local extinction of the forty-spotted pardalote on the Tasmanian mainland has been suggested (Department of Primary Industries and Water 2006) although the evidence is circumstantial (Department of Primary Industries Parks Water and Environment 2012).

Swift parrot (*Lathamus discolor*)

The swift parrot is listed as Endangered under the EPBC Act.

The swift parrot is known to be sensitive to aggressive interactions and competition from the noisy miner. It has been found in New South Wales that swift parrots are less likely to occur at potential foraging sites as the abundance of large, aggressive nectar feeders (e.g. noisy miners and *Trichoglossus haematodus* (rainbow lorikeet)) increases (Saunders and Heinsohn 2008). Impacts by noisy miners are likely to have increased since land clearing and broad-scale habitat fragmentation occurred, and the effects are likely to increase with further habitat loss and fragmentation that promote suitable conditions for the noisy miner to thrive. As such, the impact from species such as the noisy miner is listed as an action requiring ongoing monitoring and management in the current National Recovery Plan (Saunders and Tzaros 2010).

Woodland communities

Many researchers have noted an association between noisy miners and poor woodland health, as evidenced by canopy dieback (Ford and Bell 1981; Ford 1985; Loyn 1987). Experimental evidence now exists that suggests there is a causal link between the noisy miner and the exacerbation of insect-induced eucalypt dieback (Grey 2008). Removal of the noisy miner, and the subsequent re-population of remnants by smaller insectivorous birds, resulted in a significant decrease in the level of leaf damage caused by herbivorous insects in grey box remnants. This was mainly due to a reduction in damage caused by chewing and leaf-mining insects. Trees in box-ironbark remnants which were monitored following the removal of noisy miners also showed steady improvement in overall tree health (Grey, 2008). The influx of these smaller insectivorous birds once noisy miners were removed from woodland remnants appears to have resulted in a reduction in leaf damage and an

improvement in tree health in some circumstances, showing that noisy miner domination of small woodland remnants has a top-down effect, which can have an adverse impact on tree health.

The detrimental effect of noisy miners on threatened ecological communities is noted explicitly in the EPBC Act listing advices for the following ecological communities (but is not limited to these communities):

- Grey Box Grassy Woodland (Endangered) (Threatened Species Scientific Committee 2010).
- New England Peppermint (*Eucalyptus nova-anglica*) Grassy Woodlands (Critically endangered) (Threatened Species Scientific Committee 2011).
- White Box-Yellow Gum-Blakely's Red Gum Grassy Woodland (Critically endangered) (Threatened Species Scientific Committee 2006).
- Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest (Critically endangered) (Threatened Species Scientific Committee 2009).

Conclusion: The Committee considers that the threatening process is **eligible** under this criterion as the process is likely to adversely affect two or more listed threatened species and two or more listed threatened ecological communities via the reduction in abundance of small, insectivorous birds and consequent increase in tree dieback via defoliating insects.

CONCLUSION: The threatening process meets s188(4)(a), s188(4)(b) and s188(4)(c) of the *EPBC Act*.

3. Threat Abatement Plan

The threat posed by noisy miners is a symptom of a broader threat, being land clearance and habitat fragmentation. The Committee is cognisant of the fact that the noisy miner is a native species and as such has its place in a healthy landscape. Consequently, any attempts to abate the threat risk unintended negative consequences. Abatement efforts must be constrained to circumstances where the noisy miner can be reasonably considered to be exacerbating the impacts of habitat loss or degradation and/or directly poses an imminent risk of a significant impact on a highly threatened species or community.

There is a suite of measures available to reduce the negative impacts of noisy miners. Most of these focus on habitat alteration to increase the size and structural complexity of habitat patches to make them less accessible to noisy miners while providing appropriate habitat for other native bird species. Such measures include revegetation, to increase the size and/or connectedness of patches or to increase density of the shrub layer within patches, removal of grazing or reducing fire frequency. The overall biodiversity threat of habitat loss and fragmentation has long been recognised and a wide range of policy and management measures have been taken to redress the problem.

Maron et al., (2011) observe that the extensive loss of woodland habitat cannot simply be reversed and that, even where large scale habitat restoration is possible, it will take decades or centuries to restore critical habitat elements. Additional actions are required to ensure that as many woodland bird species as possible persist for long enough to benefit from such large-scale and long-term conservation efforts. The effect and significance of the threat posed by noisy miners vary spatially and with context. There is also the potential for threat abatement actions for noisy miners to have unintended consequences (e.g. excess eucalypts tend to favour noisy miner presence, planting shrubs in naturally grassy woodlands).

It has been shown that direct removal of noisy miners can have an immediate biodiversity benefit that may be long-lasting, even where other colonies remain nearby (Grey et al. 1997,

1998). Culling is a very specific, and cost effective, means of abating this process under some circumstances. This option is currently precluded by legislation in some states and is likely to be resisted by some stakeholders. The Committee also notes that culling raises ethical issues with regard to the humane disposal of the birds, and suggests that development of threat abatement advice have regard to ongoing efforts to develop such appropriate methods for other species such as the introduced Indian Myna.

The Committee notes that initiatives to reduce the impacts of noisy miners will inevitably be at a local or finer scale, such as individual properties or vegetation remnants, due to resource constraints and the spatial and contextual variability in how the process operates. A national-scale threat abatement plan is unlikely to be a feasible, effective and efficient way to abate the process as it would necessarily be broad in scope and coarse in resolution. Rather, the Committee considers that the process would be more effectively abated via the development of a threat abatement advice drawing on the ongoing research into the process and tailored to specific circumstances.

CONCLUSION: The Committee considers a Threat Abatement Plan not to be a feasible, effective and efficient way to abate the process (at this time). The noisy miner is readily identified, and the circumstances under which it exerts its effects are well-known. Where the pressure exerted by this threatening process is particularly severe it can be abated quickly and effectively, but due to the unique feature that this threatening process is a native species it requires considered and effective planning and management. Over larger spatial and temporal scales, re-vegetation and changes in composition, structure, size and shape of remnant vegetation patches may also contribute to reducing the impact of noisy miners. However, it is also possible for these efforts to be misguided so careful planning is also necessary.

The development of threat abatement advice, based on the most up to date understanding of the interaction of noisy miners with their environment, and clearly describing the appropriate context, is an appropriate approach to abating this threat.

4. Recommendations

A. The Committee recommends that the list referred to in section 183 of the EPBC Act be amended by **including** in the list as a **key threatening process**: ***'Aggressive exclusion of birds from potential woodland and forest habitat by over-abundant noisy miners (Manorina melanocephala)'***

B. The Committee recommends that a Threat Abatement Plan is not considered a feasible, efficient, or effective way to abate the process (at this time). Any advice developed to abate the threat should explicitly include stringent conditions under which any direct control would be allowed and require monitoring to determine whether that control had a measurable biodiversity benefit.

Threatened Species Scientific Committee

06 March 2013

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