

NSW SCIENTIFIC COMMITTEE

Final Determination

The Scientific Committee, established by the Threatened Species Conservation Act, has made a Final Determination to list 'Aggressive exclusion of birds from woodland and forest habitat by abundant Noisy Miners *Manorina melanocephala* (Latham 1802)' as a KEY THREATENING PROCESS in Schedule 3 of the Act. Listing of Key Threatening Processes is provided for by Part 2 of the Act.

NOTE: The Scientific Committee placed a Preliminary Determination regarding this key threatening process on public exhibition under the name Decline in woodland and forest birds due to aggressive exclusion by abundant Noisy Miners. The Committee considers that Aggressive exclusion of birds from woodland and forest habitat by abundant Noisy Miners *Manorina melanocephala* (Latham 1802) is a more appropriate name for this key threatening process.

The Scientific Committee has found that:

1. The Noisy Miner *Manorina melanocephala* (Latham 1802) is a large (24-28 cm, 70-80 g), sedentary, highly aggressive honeyeater (family Meliphagidae) endemic to eastern Australia (Higgins *et al.* 2001). The natural habitat of the Noisy Miner is the woodlands and open forests of eastern Australia from far north Queensland to Tasmania, with densities of 0.01-0.05 birds per ha reported in relatively undisturbed areas (Higgins *et al.* 2001). In NSW the Noisy Miner is found throughout the coastal plains, foothills, ranges and tablelands (up to 1200 m), as well as on the inland slopes and plains of the semi-arid zone (Higgins *et al.* 2001).
2. The Noisy Miner favours open, lightly timbered areas and habitat edges and so has benefitted from the large-scale vegetation changes that accompanied the European settlement of Australia (Higgins *et al.* 2001; Catterall *et al.* 2002; Parsons *et al.* 2006; Grey *et al.* 2007; Hannah *et al.* 2007; Howes and Maron 2007; Taylor *et al.* 2008; Maron 2009; Oldland *et al.* 2009; Grey *et al.* 2010; Maron *et al.* 2011). This includes forest and woodland clearance and fragmentation, as well as a reduction in understory vegetation by livestock grazing, invasion of exotic grasses and altered fire regimes. As a consequence, Noisy Miners have increased in abundance (Higgins *et al.* 2001; Catterall *et al.* 2002; Low 2002; Szabo *et al.* 2010), occurring at densities of up to 10 birds per ha (Higgins *et al.* 2001). In NSW, an index of abundance (reporting rate) for Noisy Miners increased by 15% between the first (1977-1981) and second (1998-2002) national bird atlases (Barrett *et al.* 2007). Since this is a common species, comparison across bird atlas surveys is considered valid.
3. Noisy Miner colonies now dominate many small (<20 ha) forest and woodland patches, woodland habitat with little shrub layer, forest edges, vegetation corridors, urban bushland and 'leafy' parks and gardens throughout much of southeastern Australia (Dow 1977; Loyn 1987; Catterall *et al.* 1991; Catterall 2004; Hastings and Beattie 2006; Parsons *et al.* 2006; Clarke and Oldland 2007; Maron 2009; Grey *et al.* 2010). In larger woodland patches (>50 ha), Noisy Miners can penetrate up to 300 m from the edge, depending on habitat type and tree density (Clarke and Oldland 2007).
4. Noisy Miners can form large complex colonies of up to several hundred individuals which cooperate in most activities including breeding and territory defence (Higgins *et al.* 2001). Noisy Miners tend to dominate the habitat they occupy often comprising more than 50% of all birds present in fragmented woodland and open forest (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). Through their cooperative aggressive behaviour Noisy Miners physically attack and actively drive away birds of similar or smaller size from areas they occupy (Dow 1977). This aggressive exclusion often results in Noisy Miners being the only

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small-medium sized bird species present in occupied habitat (Dow 1977; Grey *et al.* 1997, 1998; Piper and Catterall 2003; Clarke and Oldland 2007; Howes and Maron 2009). An analysis of data from across south-eastern Australia has shown that Noisy Miner densities of 0.8 birds per ha, or larger, is strongly negatively correlated with the abundance of small to medium sized native birds (Mac Nally *et al.* 2012). The experimental removal of Noisy Miners from habitat patches results in the recolonisation of the area by small to medium sized birds (Grey *et al.* 1997, 1998; Debus 2008) even before any change in habitat condition or structure occurs. These observations indicate that the link between abundant Noisy Miners and impoverished bird communities is direct and causal.

5. Abundant Noisy Miners are often associated with vegetation remnants suffering from ‘eucalypt dieback’ (rural tree decline), and patches with high densities of sap-sucking psyllid bugs that secrete a protective sugary coating (‘lerp’) (Ford and Bell 1982; Howes and Maron 2007; Grey 2008). Small woodland patches monopolised by dense colonies of Noisy Miners show increased frequency of damaged leaves, defoliation and crown dieback (Ford and Bell 1982; Grey 2008). It seems likely that abundant Noisy Miners contribute to habitat degradation by excluding smaller insectivorous birds that would otherwise consume herbivorous or sap-sucking insects (Loyn *et al.* 1983; Loyn 1987; Grey 2008; Grey *et al.* 2010). If Noisy Miners are removed, insectivorous birds quickly return (Grey *et al.* 1997, 1998; Debus 2008) and a significant decrease in the level of leaf damage caused by herbivorous and sap-sucking insects and a steady improvement in overall tree health has been observed (Grey 2008). The related Bell Miner (*Manorina melanophrys*) is associated with eucalypt forest dieback in eastern New South Wales with ‘Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners’ listed as a Key Threatening Process under the *Threatened Species Conservation Act 1995*.
6. A range of threatened woodland and forest bird species listed under the *Threatened Species Conservation Act 1995* are adversely affected by aggressive exclusion by abundant Noisy Miners including:

Critically Endangered species

Regent Honeyeater

Anthochaera phrygia

Endangered species

Swift Parrot

Lathamus discolor

Vulnerable species

Speckled Warbler

Chthonicola sagittata

Brown Treecreeper (eastern subspecies)

Climacteris picumnus victoriae

Varied Sittella

Daphoenositta chrysoptera

Little Lorikeet

Glossopsitta pusilla

Painted Honeyeater

Grantiella picta

Hooded Robin (south-eastern form)

Melanodryas cucullata cucullata

Black-chinned Honeyeater (eastern subspecies)

Melithreptus gularis gularis

Turquoise Parrot

Neophema pulchella

Gilbert’s Whistler

Pachycephala inornata

Scarlet Robin

Petroica boodang

Flame Robin

Petroica phoenicea

Grey-crowned Babbler (eastern subspecies)

Pomatostomus temporalis temporalis

Diamond Firetail

Stagonopleura guttata

For example, Noisy Miners have been reported destroying an active Regent Honeyeater nest, as well as driving the adults away from the nest site (Higgins *et al.* 2001). In addition, Regent

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Honeyeaters were one of a number of bird species that were only reported from a woodland remnant following the removal of Noisy Miners (Grey *et al.* 1997). Similarly, a significant negative association was found between Swift Parrot occurrence and Noisy Miners in woodland on the western slopes of NSW (Saunders and Heinsohn 2008).

These and other bird species are primarily impacted by their active exclusion from areas of otherwise suitable habitat (Mac Nally *et al.* 2012), which limits feeding, breeding and dispersal opportunities and therefore ultimately population size and persistence. Noisy Miners prefer forest and woodland on productive sites, which are now scarce in areas where agricultural clearing has targeted fertile soils (Oldland *et al.* 2009). Such sites, even small patches, may otherwise support high diversity and abundance of woodland birds, including threatened and declining species (*e.g.* Fischer and Lindenmayer 2002; Debus *et al.* 2006; Maron 2007). Since fertile sites support nutritious foliage and high densities of invertebrates (Recher *et al.* 1996), they also potentially support high breeding productivity of threatened and declining woodland birds. This is because food supply is one of the most significant factors affecting nest success (Fulton 2008).

7. The aggressive exclusion of woodland and forest birds by abundant Noisy Miners adversely affects many threatened ecological communities listed under the *Threatened Species Conservation Act 1995*, by contributing to their degradation. Listed ecological communities known to be impacted by abundant Noisy Miners include White Box – Yellow Box – Blakely’s Red Gum Woodland (Debus 2008) and Brigalow within the Brigalow Belt South, Nandewar and Darling Riverine Plains Bioregions (Maron *et al.* 2011). However, abundant Noisy Miners are also likely to negatively impact all other listed eucalypt-dominated grassy woodland communities on the NSW coastal plain, tablelands, inland slopes and plains, as well as remnants of many listed eucalypt forest communities, including those in urban areas. Small and/or linear remnant patches on productive sites are likely to be most highly impacted. Through the active exclusion of other birds (often insectivores and nectivores), ecosystem function in the listed communities can be compromised by increased insect herbivory (see point 5) and potentially reduced pollen/seed dispersal.
8. Aggressive exclusion of woodland and forest birds by abundant Noisy Miners already affects or broadly affects additional species of woodland birds recognised as declining (Reid 1999; Barrett and Silcocks 2002; Debus *et al.* 2006; Barrett *et al.* 2007; Debus 2006, 2008; Mac Nally *et al.* 2012) though not formally listed as threatened. This includes but is not restricted to:

Yellow-rumped Thornbill	<i>Acanthiza chrysorrhoa</i>
Buff-rumped Thornbill	<i>Acanthiza reguloides</i>
Chestnut-rumped Thornbill	<i>Acanthiza uropygialis</i>
Southern Whiteface	<i>Aphelocephala leucopsis</i>
Dusky Woodswallow	<i>Artamus cyanopterus</i>
White-browed Woodswallow	<i>Artamus superciliosus</i>
Eastern Yellow Robin	<i>Eopsaltria australis</i>
Crested Shrike-tit	<i>Falcunculus frontatus</i>
Peaceful Dove	<i>Geopelia striata</i>
White-winged Triller	<i>Lalage sueurii</i>
Jacky Winter	<i>Microeca fascinans</i>
Restless Flycatcher	<i>Myiagra inquieta</i>
Rufous Whistler	<i>Pachycephala rufiventris</i>
Red-capped Robin	<i>Petroica goodenovii</i>
White-browed Babbler	<i>Pomatostomus superciliosus</i>
Double-barred Finch	<i>Taeniopygia bichenovii</i>

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Aggressive exclusion of these species from otherwise available habitat by Noisy Miners is likely to contribute to these species that are not threatened to become threatened.

9. Three existing Key Threatening Processes contribute to the formation of habitat that favours an increase in Noisy Miner abundance: i) Clearing of native vegetation; ii) High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition; iii) Invasion of native plant communities by exotic perennial grasses. However, these Key Threatening Processes do not explain all situations where Noisy Miners actively exclude other birds. Moreover the presence of Noisy Miners is usually more strongly correlated with low bird abundance/diversity than any of these or other disturbance factors including remnant size, degree of isolation and habitat structure (Barrett *et al.* 1994; Grey *et al.* 1997, 1998; Major *et al.* 2001; Catterall *et al.* 2002; Piper and Catterall 2003; Catterall 2004; Debus *et al.* 2006; Parsons *et al.* 2006; Hannah *et al.* 2007; Maron 2007, 2008, 2009; Oldland *et al.* 2009; Grey *et al.* 2010; Maron *et al.* 2011, Mac Nally *et al.* 2012). The major causal role played by abundant Noisy Miners in reducing bird abundance/diversity has led to them being described as a 'reverse keystone species' (Piper and Catterall 2003) and a 'despotic, high-impact species' (Mac Nally *et al.* 2012) controlling avian assemblage structure at a landscape scale.
10. 'Aggressive exclusion of birds from woodland and forest habitat by abundant Noisy Miners *Manorina melanocephala* (Latham 1802)' is eligible to be listed as a Key Threatening Process as, in the opinion of the Scientific Committee:
 - (a) it adversely affects threatened species, populations or ecological communities, or
 - (b) causes species, populations or ecological communities that are not threatened to become threatened.

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Scientific Committee

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