

# Preliminary range-wide surveys of the heavily traded Tenggara Hill Myna *Gracula venerata*

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The recently split but poorly known Endangered Tenggara Hill Myna *Gracula venerata* is heavily traded throughout its range in the Lesser Sunda Islands, Indonesia, and, as a hole-nester, may be particularly sensitive to habitat degradation. We undertook a range-wide survey of the species, as a by-product of visits to potential sites for the Critically Endangered Yellow-crested Cockatoo *Cacatua sulphurea*, involving interviews with stakeholders and short field surveys recording simple encounter rates. Mynas were absent from the majority of the landscape on the seven islands visited—Sumbawa, Moyo, Flores, Adonara, Lembata, Pantar and Alor—but were known or strongly expected to occur at 41 of 71 sites surveyed. Encounter rates were, however, low at almost every site (0.14/hour over 137 hours spent in potentially suitable habitat) and generally matched local perceptions of both rarity and decline—‘rare’ or ‘uncommon’ in 28 of 41 locations. Mynas tended to be associated with the more remote areas of cultivated land, forest borders and degraded forest. Most worrying was that trapping of mynas occurred at a minimum 27 of 41 sites, with the main trapping method being the systematic taking of chicks from known nest-holes. The persistent taking of chicks is probably unsustainable, seriously reducing recruitment into the population. Mynas currently fetch around US\$15–35, and are most often either kept locally as pets or exported by sea to other Indonesian islands. Its IUCN Red List category should probably remain Endangered, but dedicated ecological and population work on the species should be initiated immediately. With appropriate knowledge of the species’s status, and with modest funding and sufficient effort given to local public awareness and law enforcement initiatives, protection of remaining populations might be within reach.

## INTRODUCTION

For many years after its description in 1850, the taxon *Gracula religiosa venerata* was treated as a subspecies of the Common Hill Myna *G. religiosa* (Amadon 1962, Morony *et al.* 1975, White & Bruce 1986, Coates & Bishop 1997, Feare & Craig 1998, Clements 2007, Craig & Feare 2009, Dickinson & Christidis 2014). However, it was recently given species rank on the basis of several phenotypic characters, including: dark green rather than dark blue gloss to the body plumage; wattle extending in a double line up the central hindcrown; distinctive raised bilateral lumps on the frontal part of the crown; and voice, reportedly involving several different calls (del Hoyo & Collar 2016).

*Gracula* species are celebrated for their powerful voices and imitative abilities, and have consequently been heavily exploited in trade for decades (Bertram 1969, Archawaranon 2003). The form *venerata* was briefly documented in a review of taxa at risk of extinction in Indonesia (Eaton *et al.* 2015), and when it was subsequently elevated to species rank and assessed for its IUCN Red List category it qualified as Endangered (BirdLife International 2018). The justification for this treatment is that the species is extensively targeted for the cagebird trade and is suspected to be declining at a rate exceeding 50% over three generations (BirdLife International 2018), with a total population estimated at 2,500–9,999 mature individuals and no known subpopulations numbering more than 90 mature individuals (BirdLife International 2018).

There are few historical data on population status. Rensch (1931) reported the species to be ‘quite rare’ on Sumbawa but ‘fairly common’ on Flores, where he observed groups of up to five individuals. Butchart *et al.* (1994) found it at only one of six survey locations on Sumbawa; during 279 hours in the field the encounter rate was 0.09 individuals/field hour. At three out of seven survey locations on Flores, encounter rates were 0.012, 0.45 and 0.5 individuals/hour during 241, 31 and 104 hours in the field respectively. From this evidence, and in the light of Eaton *et al.* (2015), who reported that observers repeatedly found tiny numbers or none at all during visits to different islands—the highest number for a single observation was five—the population estimate by BirdLife International (2018) of 2,500–9,999 mature individuals appears somewhat optimistic. In 2017 we took advantage of the opportunity to investigate the status of the Tenggara Hill Myna (hereafter myna) on islands which it shares with the Yellow-crested Cockatoo *Cacatua sulphurea*, whose status and ecology we

are studying in the wake of a recent taxonomic revision (Collar & Marsden 2014).

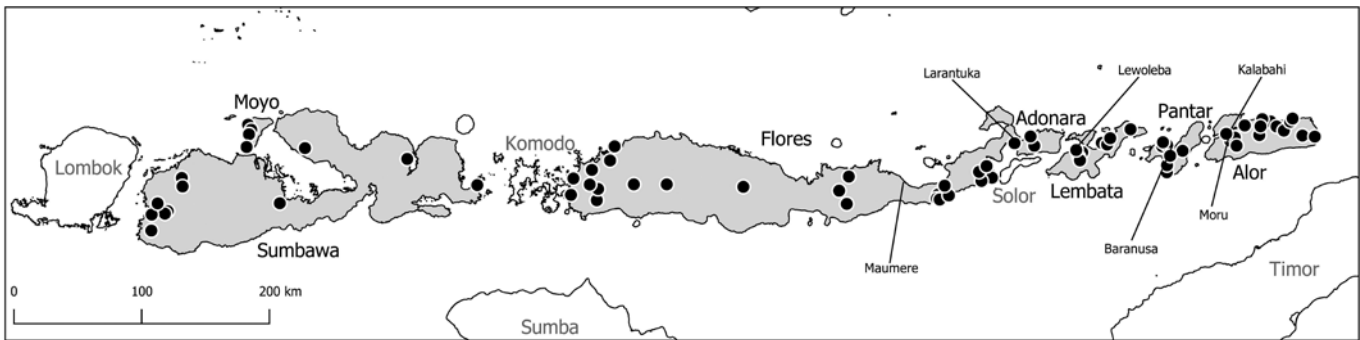
The natural range of the myna has been somewhat variously reported. It occupies the northern Lesser Sunda Islands (Nusa Tenggara), but not all accounts agree on the islands in question (most just give ‘Sumbawa east to Alor’). Amadon (1962), White & Bruce (1986) and Feare & Craig (1998) gave Sumbawa, Flores, Pantar and Alor, and the 48 specimens of the species examined by NJC (14 in AMNH, 10 in NHMUK, 8 in RMNH, 6 in SMF, 5 in ZMB, 3 in MNHN and 2 in MZB; museum names stated in full in the Acknowledgements) were collected on these islands: 10 on Sumbawa, 31 on Flores, 2 on Pantar and 5 on Alor. However, Coates & Bishop (1997) added Lombok (=Lembata), Trainor (2002b) added Adonara, and Craig & Feare (2009) added Lombok, this latter addition being followed by both del Hoyo & Collar (2016) and BirdLife International (2018). Of these, Lombok is evidently in error, as the species has explicitly been noted as absent from the island (Rensch 1931, Myers & Bishop 2005). From the literature and museum evidence at the start of the project we thus had six islands on which the species was known to occur: Sumbawa, Flores, Adonara, Lembata, Pantar and Alor.

## METHODS

In 2017 AR visited the islands of Sumbawa (including the offshore island of Moyo), Flores, Adonara, Lembata, Pantar and Alor, in that order, between 18 March and 21 May (Figure 1), and, with BAS, Komodo and Rinca between 4 November and 17 December. Since the fieldwork was part of AR’s study of Yellow-crested Cockatoo (hereafter cockatoo), location choice was almost entirely limited by the search for the latter, and this also determined the length of stay in each location.

AR supplemented her field observations with information from local experts: on Flores, Burung Indonesia’s Birdguide Officer; on Sumbawa, the ecologist of a mining company in Jereweh; local government conservation authorities (KSDAs) in Sumbawa Besar, Labuan Bajo (Flores), Ruteng (Flores), Maumere (Flores) and Kalabahi (Alor), and national park employees in Gn Tambora (Sumbawa); and for Solor, four residents of the island encountered on Flores. She also undertook basic informal interviews with local villagers, forest users, trappers and ex-trappers and enquired about

**Figure 1.** Range of Tenggara Hill Myna *Gracula venerata* (shaded grey) with locations visited or otherwise included in this survey. For security reasons we do not distinguish between sites with and without Tenggara Hill Mynas on this map.



myna sightings in settlements, agricultural areas, adjacent forest and remote forest locations, to assess reported trends in encounter rates and potential reasons for them, which was usually followed by volunteered detailed answers about trapping. She aimed for 10 interviews per location, which each took between two minutes (chance encounters on the track) and two hours (guides, trappers and village heads). Answers on perceived occurrence were translated into categories as follows: ‘common’—observed regularly, easy to see without dedicated searches; ‘frequent’—many, but found only when targeting specific locations or in a certain season; ‘uncommon’—few, encountered only occasionally when in appropriate habitat, not easy to find even when searching; ‘rare’—seldom seen, even expert trappers had difficulty finding the species; and ‘absent’—never seen in the area or not for years. Reliability of information was checked by asking about other species, myna behaviour, breeding season, productivity and prices (e.g. successful trappers would be expected to know the maximum clutch size and breeding season). Data on other forest use and socio-economic factors in the community were obtained from local authorities.

AR recorded all myna encounters and the time spent in the field at times of high bird activity (sunrise to 10h30 and 15h00 to sunset). Time in the field was spent walking (50%), standing at a viewpoint (30%), and doing bird point counts (10%) and vegetation data collection (10%). Habitat types were described as: cultivation, abandoned cultivation, forest of unknown type, secondary forest or primary forest. Information on protection status under Indonesian law was obtained from government conservation offices and maps. Protection due to local beliefs or topography was determined on site.

The following characteristics of nest cavities located were recorded: height above ground level measured with a rangefinder (Nikon Forestry Pro) to the nearest m; diameter at breast height (DBH) of nest tree taken from girth measurements to the nearest cm with a tape measure; and cavity entrance dimensions estimated to the nearest cm if fully visible from the ground. Tree species were identified according to their local names by the guides, which were then checked using images and the help of experts. Regional differences in the ratio of sites with myna presence/absence were examined with a  $\chi^2$  test. In accordance with recent conservation considerations (Collar *et al.* 2017), to avoid supplying information to potential non-local trappers or traders we suppress location names in this paper and present the study area on the map without distinguishing between myna presence and absence. Details have been provided to BirdLife International and are also available to bona fide researchers from the authors.

## RESULTS

Across the seven islands (counting Moyo as a separate island), evidence of the presence of the myna was found at 41 locations (Table 1). Four residents of an eighth island, Solor, stated

independently that there is little forest left there and the avifauna is very depauperate; although they were familiar with the species from captive birds on other islands, none of them had seen mynas on Solor in decades. Intensive surveys on Komodo and Rinca yielded no records of the myna, and long-standing national park staff supported this finding. We found no evidence that other *Gracula* species had been released on any of the islands visited, or that any other myna species had been released into the range. All individuals seen well in captivity and in the field were identified by their wattle as Tenggara Hill Myna.

Fieldwork in suitable habitat at 23 locations resulted in direct myna encounters at only seven, with a minimum of 22 individuals seen or heard in 20 encounters. At 41 locations where the myna was reported as present, local stakeholders reported perceived abundance of the species as: ‘common’ in four, ‘frequent’ in nine, ‘uncommon’ in 11 and ‘rare’ in 17. These reports matched our mean encounter rates reasonably well: common—mean = 0.71 per hour (17 hours); frequent—0.25 (20 hours); uncommon—0.07 (15 hours); and rare—0.02 (85 hours). In 30 more locations, the myna was reported to be absent and AR usually did not engage in fieldwork at these sites (three exceptions where cockatoos but not mynas were found were mangrove-dominated sites).

The ratio of sites with reported myna presence differed between the three major areas of the survey ( $\chi^2 = 6.68$ ;  $df = 2$ ,  $p < 0.05$ ). It was intermediate in the western part of the range (Sumbawa with Moyo), being reportedly present at nine out of 15 locations; lowest in the centre (Flores), 9/24; and highest in the east (Adonara to Alor), 23/34. In 32 locations (78%), local people considered the myna population to have declined in recent years (Table 1). All our myna encounters, as well as the majority of those reported by villagers, were in more remote cultivation (plantations such as coffee *Coffea arabica* and *C. canephora*, candlenut *Aleurites moluccanus*, Java almond *Canarium vulgare*, coconut *Cocos nucifera*, palmyra palms *Borassus flabellifer*, banana palms *Musa* sp., corn *Zea mais*, peanuts *Arachis hypogaea*) or in the forest, but residents also reported birds feeding in particular fruiting trees (*Canarium* spp., *Ficus* spp. and others) directly in their villages during September–December.

In most locations where the myna was reported to have disappeared in recent decades, local people attributed this to trapping. Current capture of the myna was reported in 27 of the 41 locations and suspected in seven others. In the other seven locations where no capture was reported, this was attributed to awareness work by Burung Indonesia (two locations), protection by the company Newmont Mining (one), a recent accident where a trapper fell to his death (one), traditional beliefs (one), and trouble finding the birds due to their extreme rarity (two).

In the 15 locations where information was obtained directly from trappers or ex-trappers, maximum clutch size was said to be three, with the same maximum for harvested or fledged chicks per nest. All trappers agreed that capturing adults was pointless as the birds ‘will not eat’ in captivity and would not survive.

**Table 1. Locations (41) where there was evidence for the presence of Tenggara Hill Myna *Gracula venerata* in 2017 in the Lesser Sunda island chain.**

Key:

Occurrence and trend: (↓) decreasing; (→) stable.

Habitat types: **c**: cultivation; **ac**: abandoned cultivation; **f**: forest of unknown type; **sf**: secondary forest; **pf**: primary forest.Protection: **CA**: conservation area; **HL**: protected forest; **HP**: production forest; **HR**: hunting reserve; **TWA**: tourist nature park; **sac**: sacred land in local/traditional beliefs; **topo**: natural protection by topography making access difficult; **?**: status unknown.Sources of information: **1**: local villagers/forest users; **2**: local trappers/ex-trappers; **3**: Tri Endang Wahyuni & Syamsul Ibrahim, Government Conservation Authority West Nusa Tenggara; **4**: Polhut, Forest Police Moyo; **5**: Muhamad Salamuddin Yusuf, Environmental Department, PT Newmont Nusa Tenggara; **6**: Samuel Rabenak & Tiburtius Hani, Burung Indonesia.

Site	Habitat visited 2017	Encounters/h (field hours)	Occurrence (and trend) reported	Habitat	Protection	Myna capture	Logging reported	Source/informants
<b>Sumbawa: 26 March–6 April and 10–16 April</b>								
S1	yes	1.0 (5)	common (↓)	sf	near mining land	yes	yes	4,5
S2	yes	0.36 (5.5)	common (↓)	sf	near mining land	yes	yes	1,4,5
S3	no	n/a	common (?)	pf	CA & mining	no	no	5
S4	yes	0.77 (6.5)	common (↓)	sf, pf	none	yes	yes	1,2
S5	no	n/a	frequent (↓)	c, sf	none	yes	yes	1,2
<b>Summary</b>	<b>3 / 5</b>	<b>0.67 (17)</b>	<b>f – c (↓)</b>			<b>4 / 5</b>	<b>4 / 5</b>	
<b>Moyo: 18–25 March and 6–10 April</b>								
M1	yes	0 (7)	rare (→)	sf, c, ac	HR	?	yes	1,3,4
M2	yes	0 (10.5)	rare (→)	sf, c	HR	?	yes	1,3,4
M3	yes	0 (19.5)	rare (→)	sf, c	HR	?	yes	1,3,4
M4	yes	0 (20)	rare (→)	sf	HR	?	no	3,4
<b>Summary</b>	<b>4 / 4</b>	<b>0 (57)</b>	<b>r (→)</b>			<b>?</b>	<b>3 / 4</b>	
<b>Flores: 16 April–2 May</b>								
F1	yes	0 (6)	rare (↓)	c, sf	?	no	no	1,2,6
F2	yes	0 (1)	rare (?)	c	?	no	no	1,6
F3	yes	0 (2)	uncommon (↓)	c, sf	HL	yes	?	1,6
F4	yes	0 (3)	frequent (↓)	c, sf	HL	yes	yes	1
F5	no	n/a	uncommon (↓)	sf	HL	yes	yes	1,2
F6	no	n/a	uncommon (↓)	sf	HL	yes	yes	1
F7	no	n/a	uncommon (↓)	sf	HL	yes	yes	1
F8	no	n/a	rare (↓)	c, sf	?	yes	?	1,2
F9	no	n/a	rare (↓)	c, sf	?	yes	?	1
<b>Summary</b>	<b>4 / 9</b>	<b>0 (12)</b>	<b>r (↓)</b>			<b>7 / 9</b>	<b>4 / 9</b>	
<b>Adonara: 1 May</b>								
Ad1	yes	0 (2)	rare (↓)	c, sf	?	no	?	1,2
<b>Summary</b>	<b>1 / 1</b>	<b>0 (2)</b>	<b>r (↓)</b>			<b>0 / 1</b>	<b>?</b>	
<b>Lembata: 2–8 May</b>								
L1	yes	0 (2)	rare (?)	pf	sac	no	no	1
L2	no	n/a	frequent (→)	c, sf	HL	yes	?	1,2
L3	no	n/a	uncommon (↓)	sf	?	yes	yes	1,2
L4	no	n/a	uncommon (↓)	c	none	yes	no	1,2
L5	no	n/a	frequent (20 ind) (↓)	c, sf	HL	yes	yes	1
L6	yes	0.33 (12)	frequent (↓)	sf, ac	HL	yes	yes	1,2
L7	no	n/a	uncommon (↓)	c, sf	?	yes	yes	1
<b>Summary</b>	<b>2 / 7</b>	<b>0.29 (14)</b>	<b>U (↓)</b>			<b>6 / 7</b>	<b>4 / 7</b>	
<b>Pantar: 8–15 May</b>								
P1	yes	0.67 (3)	rare (↓)	sf, pf	?	yes	yes	1
P2	no	n/a	rare (↓)	sf	HP	yes	no	1
P3	yes	0 (7.5)	rare (↓)	sf	HL	yes	no	1
P4	yes	0 (6)	rare (↓)	pf	topo	?	yes	1
P5	yes	0 (2)	frequent (↓)	sf	HL	yes	no	1
<b>Summary</b>	<b>4 / 5</b>	<b>0.11 (18.5)</b>	<b>r (↓)</b>			<b>4 / 5</b>	<b>2 / 5</b>	

**Table 1 continued.** Locations (41) where there was evidence for the presence of Tenggara Hill Myna *Gracula venerata* in 2017 in the Lesser Sunda island chain.

Site	Habitat visited 2017	Encounters/h (field hours)	Occurrence (and trend) reported	Habitat	Protection	Myna capture	Logging reported	Source/informants
<b>Alor: 15–21 May</b>								
AI1	no	n/a	frequent (↓)	sf	?	yes	yes	1,2
AI2	no	n/a	frequent (→)	sf	HL	yes	yes	
AI3	yes	0 (2.5)	uncommon (↓)	sf	?	yes	yes	1,2
AI4	no	n/a	rare (↓)	sf	none	no, too rare	?	1
AI5	yes	0.33 (3)	frequent (↓)	c, sf	TWA	yes	yes	1,2
AI6	yes	0 (1)	uncommon (↓)	ac, sf	none	no, since 2014	?	1
AI7	no	n/a	rare (↓)	ac, sf	sac	?	yes	1
AI8	yes	0.14 (7)	uncommon (↓)	ac, sf	sac	yes	yes	1,2
AI9	yes	0 (2.5)	uncommon (↓)	ac, sf	topo	?	yes	1,2
AI10	no	n/a	rare (↓)	pf	?	yes	yes	1
<b>Summary</b>	<b>5 / 10</b>	<b>0.13 (16)</b>	<b>u (↓)</b>			<b>6 / 10</b>	<b>8 / 10</b>	

Trappers preferred to harvest chicks when they were at least partially feathered, but some asserted that hand-rearing chicks was unproblematic even if chicks were taken soon after hatching. Statements on timing of breeding varied slightly but all placed it between September and March, with chick harvesting taking place between December and March. Information on broods per pair and year was not reliable, as trappers admitted that they did not have a way of recognising individuals, but three claimed that they could harvest 2–3 broods per year from one nest. The five recently occupied myna cavities shown to AR were in trees between 10–34 m in height (two in *Ficus* sp., one in a dead *Borassus flabellifer* and two in unknown species), DBH 26–85 cm with entrances 7–16 m from the ground and entrance hole dimensions between 6 × 6 cm and 10 × 15 cm (Table 2).

The myna trapping was in the hands of local people in all surveyed locations, even if other species such as songbirds or cockatoos were captured by ‘outsiders’. All trappers said that they sell the myna locally. Trappers on Lembata and Pantar sell their birds to a single commercial trader near the main harbour on each island; occasionally birds are traded directly between trappers and local acquaintances to keep as pets. On Alor, the situation was said to be similar but involving several commercial traders, one in the village of Moru, the others in the harbour town of Kalabahi.

Trappers stated that they sold the myna for prices equivalent to US\$15–35 per chick in 2017. Some were aware that these birds were sold on to ‘people on boats’ for double the price, but did not know where the birds were taken from there. Boats calling at these islands’ small harbours trade mainly with nearby destinations in the Lesser Sunda Islands. Despite the national ban on trading wild birds (Indonesian law PP No.7/1999), few of the villagers and trappers knew about this and they were unafraid of enforcement, displaying their pet mynas openly in front yards. The situation might, however, be different with commercial traders. In East Flores, the myna is sold in Maumere or Larantuka, but it was unclear if there are specialised traders (middlemen) or

if all captured birds are sold opportunistically from market stalls and shops alongside other goods. We do not have information about trade routes in West Flores and Sumbawa as so few birds survive outside protected areas.

During interviews, potential threats to the myna other than trapping were not mentioned unless AR specifically asked about them. Local people perceived habitat destruction and nest predators as potential threats, but judged their effects to be negligible in comparison to trapping. Nevertheless, legal and/or illegal logging is known to take place in 25 of the 41 locations and suspected in a further seven. In addition, as a cavity-nester the myna faces several potential predators and competitors, including Long-tailed Macaque *Macaca fascicularis*, which has been introduced to Sumbawa, Moyo and Flores but are absent on the eastern islands (Monk *et al.* 1997); Asian Palm Civet *Paradoxurus hermaphroditus*; Oriental Dollarbird *Eurystomus orientalis*, which is known to be a problem for the cockatoo nesting on Sumbawa (Yusuf 2014); and rats *Rattus* spp. In three locations villagers reported that they shoot the adult myna for food.

## DISCUSSION

Being a by-product of fieldwork targeting the Yellow-crested Cockatoo, this survey of the Tenggara Hill Myna was not a comprehensive assessment of the species’ conservation status. However, it does serve to highlight the urgent need for such an assessment. The findings also highlight the potential and need for synergy with conservation action aimed at cockatoos, and indicate that the protection of remaining populations is probably achievable given modest funding and effort.

We can confirm that the range of the species includes Sumbawa, Flores, Adonara, Lembata, Pantar and Alor. To this we have added the island of Moyo, off the north coast of Sumbawa, but like previous authors (e.g. Amadon 1962, White & Bruce 1986 and Feare &

**Table 2.** Characteristics of five reported Tenggara Hill Myna nests.

Site	Island	Tree species	Tree height (m)	Entrance height (m)	Entrance width × ht (cm)	Month last known occupied	Altitude (m)
S2	Sumbawa	<i>Ficus</i> sp.	25	15	10×15	unknown	175
M3	Moyo	unknown	10	7	6×6	Mar 2017	107
M3	Moyo	<i>Ficus</i> sp.	27	14	unknown	2016	44
L6	Lembata	<i>Borassus flabellifer</i> , dead	11	8	5×15	Feb 2017	196
AI8	Alor	unknown	34	16	unknown	Nov 2016	120



Craig 1998) we could find no evidence of the myna on Komodo or Rinca, despite their location between Sumbawa and Flores and the considerable field effort on these islands to census the cockatoo. Given the relatively strong conservation management of these islands, owing to the presence of the Komodo Dragon *Varanus komodoensis*, it is as regrettable as it is puzzling that the myna does not occur on them.

The myna is also probably absent from Solor, off eastern Flores, where they were reported neither by residents during this study nor by Schellekens *et al.* (2011) in a brief ornithological trip in 2005. Myna presence on Pulau Besar off northern Flores is also unlikely as birds were not encountered by Butchart *et al.* (1993) in 25 field hours or by Trainor *et al.* (2006) in three field days. Whether the species is present on other small islands in the region, such as Pulau Panjang, Pulau Saringgi and Pulau Sangeang off Sumbawa, Pulau Palu off northern Flores, and Alor Kecil between Pantar and Alor, is unknown, but the size of these islands is such that there is likely to be little remnant forest and myna numbers would not be expected to be large.

The site of greatest potential importance that was not covered adequately by this survey is the large area of forest in south-west Sumbawa, which is generally difficult to access. AR visited its fringes during the cockatoo fieldwork and recorded the highest myna encounter rates of the survey (0.67 records/field hour), but was unable to reach the centre owing to legal and temporal constraints. Although it is possible that a significant population of the myna might remain in this area, the balance of evidence appears to suggest that this is unlikely. Rensch (1931) already found the species to be 'quite rare' on Sumbawa in 1927, while fieldwork in 1993 across many areas of the island, including three locations in this forest and its perimeter, yielded encounters in only one location (0.093 records/field hour) and led to the judgement that the myna 'must... be considered to be under some threat...' and 'probably declining through trapping for the cage-bird trade' (Butchart *et al.* 1993, 1996). Moreover, traders and trappers did not give any indication that an untapped population existed on Sumbawa. This area should nonetheless be a high priority for future survey.

Overall, it appears that the species is at serious risk of extinction. This improvised study supports the evidence of Eaton *et al.* (2015), who assembled reports of trade-driven declines starting in the 1990s and of a notable scarcity across the range in the present century. We find that the species is absent from much of the landscape of the Lesser Sunda Islands; that it is rare at many sites; that populations at 80% of known sites are viewed locally to be in decline; and that local trappers are active in most areas and operate freely. The inescapable implication is that trade pressure on the myna is continuing to force a widespread decline in a global population of unknown size but already considered potentially as low as 2,500 mature individuals (BirdLife International 2018), and (from our own incomplete survey) possibly very much lower. With logging compounding difficulties in about two-thirds of known sites, the case for conservation intervention is compelling.

We therefore recommend that a comprehensive range-wide census of the species take place as a matter of the greatest urgency. Given the universal presence of trapping, public awareness campaigns in the communities adjacent to the forest can be expected to have some effect. This is particularly the case on the eastern islands, where the villages are remote and communities closely knit. Improving law enforcement against middlemen has the potential to stop the trade at least temporarily because of its centralised structure. Both these approaches would also directly benefit the Yellow-crested Cockatoo, as in the majority of areas the trappers and traders are identical for both species. Surveys on Sumbawa should also target the Scarlet-breasted Lorikeet *Trichoglossus forsteni*, which is probably even more threatened than either the cockatoo or the myna (see Collar 2017).

## ACKNOWLEDGEMENTS

This research was funded by Loro Parque Fundación and Zoologische Gesellschaft für Arten- und Populationsschutz (Fonds für Bedrohte Papageien, Strunden Papageienstiftung). AR was supported by a stipend of the German Academic Exchange Service (DAAD Jahresstipendium für Doktoranden) for part of the study. We thank the staff of Burung Indonesia (in particular R. N. D. Limu, S. Rabenak, D. Agista and the Sumba and Flores teams); Environmental Department of PT Newmont (M. S. Yusuf); BKSDA NTB (in particular T. E. Wahyuni and S. Ibrahim); KSDA NTT at Labuan Bajo, Ruteng, Maumere, Kupang and Kalabahi; Polhut Moyo; the many guides and hosts on the islands; C. Trainor for kindly providing us with recordings of *G. venerata* calls for identification training; S. H. M. Butchart for exhuming records from his 1993 expedition to Sumbawa; O. D. Prihatmoko from World Parrot Trust for information on Sumbawa and Moyo; and the Indonesian Government (in particular RISTEKDIKTI and KLHK) for granting permission for this research. We thank the curators and staff who permitted NJC access to specimens in the American Museum of Natural History, New York, USA (AMNH), Muséum National d'Histoire Naturelle, Paris, France (MNHN), Museum of Zoology, Bogor, Indonesia (MZB), Natural History Museum, Tring, UK (NHMUK), Naturalis Biodiversity Centre, Leiden, Netherlands (RMNH), Senckenberg Museum, Frankfurt, Germany (SMF), and Zoogisches Museum, Berlin, Germany (ZMB). Finally, thanks go to the reviewers S. H. M. Butchart and P. Andrew for valuable comments and suggestions.

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