

Hunting for solutions to the loss of avian diversity

ALEXANDER C. LEES

Birds are arguably the best known and most celebrated major branch of the evolutionary tree of life. They are studied by a vast global network of ornithologists, patronized by myriad specialist conservation NGOs and avidly watched by millions of birders. Yet despite this attention 1,445 bird species are threatened with extinction: 12.9% of 11,162 species (Birdlife International, 2020). The principal threats affecting the largest number of bird species are agriculture, selective logging, and hunting and trapping. These threats often interact synergistically: agricultural expansion, for example, is accompanied by degradation of remaining habitat, and increased accessibility of habitat remnants permits consumptive usage of birds for bushmeat and the wildlife trade (Symes et al., 2018). The eight articles in the bird conservation theme of this issue cover threatened species across the avian tree of life from the tropics to the Arctic, the threats they face, and the data needed to inform conservation interventions. These include estimating habitat extent and population size (Khamcha et al., 2021; Yong et al., 2021; Savini et al., 2021), understanding the patterns of usage of wild birds for food and as pets (Jain et al., 2021; Silva et al., 2021) and the motivations that underpin this usage (Sánchez-Mercado et al., 2021; Newth et al., 2021). All of this knowledge needs to be channelled towards decision-makers (Pérez-Granados & López-Iborra, 2021).

Defaunation as a result of a burgeoning illegal trade in wildlife affects c. 45% of all bird species (Scheffers et al., 2019) and is particularly prevalent in South-east Asia. To understand trade dynamics and to mitigate against harm, it is necessary to go beyond market surveys and trade volumes and understand the networks that shape the trade. Jain et al. (2021) explore the dynamic parrot trade ecosystem of Singapore, a global hub for both legally and illegally traded wildlife. Most parrot owners indicated a preference for captive-bred over wild-caught birds, were concerned about illegal hunting and were willing to both pay more and wait longer to obtain sustainably sourced birds. Trade in wild birds also affects species of conservation concern elsewhere. Silva et al. (2021) characterize the ethnoornithological knowledge of bird keepers in the eastern Brazilian Amazon. They found evidence for 23 passerine species in trade and that bird keeping involved locally caught passerines, birds brought from hubs in Suriname, French Guiana and Guyana, and birds bred locally in captivity. Fourteen of these species are members of the family Thraupidae, the tanagers, including the Endangered great-billed seed-finch

Sporophila maximiliani, a species now rarely encountered anywhere in the wild in Brazil because it has been intensively trapped (Ubaid et al., 2018).

To address illegal killing and unsustainable trade in wildlife we need knowledge of both the biology of focal species and of human psychology. Newth et al. (2021) develop a model to predict intention to hunt protected wildlife, illustrated with a case study of Bewick's swan *Cygnus columbianus bewickii* in the Arctic of European Russia. Adapting an established socio-psychological model—the theory of planned behaviour—they used a questionnaire survey of hunters who may have been involved in targeting this declining and strictly protected species. The authors found that 14% of 236 interviewees intended to continue hunting swans and that conservation interventions should be targeted at the socio-psychological conditions that influence hunters' attitudes and their social norms and perceived behavioural control. Sánchez-Mercado et al. (2021) also employ the theory of planned behaviour as a lens to examine the intentions of people to keep the Near Threatened yellow-shouldered Amazon *Amazona barbadensis* as a pet on Margarita Island, Venezuela. Of the interviewees they contacted, 33% kept Amazons, with strong empathy and compassion for wild animals motivating ownership. This misguided perception of the impacts of captivity has also been demonstrated in other studies; for example, bird-owners were more likely than non-bird-owners to agree with the statement that 'birds live longer in cages than in the wild' (Marshall et al., 2021).

The dramatic declines of many passerine bird species in South-east Asia, often referred to as the Asian Songbird Crisis, has been precipitated by the wildlife trade acting in synergy with habitat loss. One of the species that epitomizes this loss of avian biodiversity is the Critically Endangered Gurney's pitta *Hydrornis gurneyi*, a species that was for over a century known only from a handful of birds kept in captivity before being rediscovered in the wild in Thailand in 1986 (Shwe et al., 2020). The species subsequently disappeared again from the wild there, but not before its discovery in southern Myanmar. Savini et al. (2021) quantify the ongoing reduction in habitat extent for the species in Myanmar. They found that suitable habitat has decreased by 8% since 2017, with > 10% of remaining habitat scattered in forest fragments of < 1 km². This indicates a bleak outlook for the long-term survival of the species, and all of its suitable habitat could be lost by 2080. Another rare passerine occurring in Myanmar and Thailand, and in south-west China, the Endangered giant nuthatch *Sitta magna*, has also been recorded in the bird trade, but is primarily threatened by the loss, fragmentation and degradation of its pine forest

ALEXANDER C. LEES (ORCID orcid.org/0000-0001-7603-9081, alexander.lees@mmu.ac.uk) Department of Natural Sciences, Manchester Metropolitan University, Manchester, M1 5GD, UK, and Cornell Lab of Ornithology, Cornell University, Ithaca, USA

This is an Open Access article, distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives licence (<http://creativecommons.org/licenses/by-nc-nd/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is unaltered and is properly cited. The written permission of Cambridge University Press must be obtained for commercial re-use or in order to create a derivative work.



The rusty-collared seedeater *Sporophila collaris*, one of the bird species popular in the trade of wild-caught and captive-bred birds in the eastern Amazonia of Brazil. Photo: Alexander C. Lees.

habitats. Khamcha et al. (2021) estimate that c. 580 individuals may persist in Thailand, with 3.7 individuals/km² in 156 km² of suitable habitat, most of which is in protected areas. The extent of suitable habitat for the species has declined despite this protection, but their field surveys did at least also uncover the species in two locations where it had not previously been recorded, including one representing a minor range extension.

Populations of many resident and migratory waterbirds on the East Asian–Australasian Flyway are in steep decline, especially coastal species; this is mostly a result of habitat loss but potentially also because of unsustainable hunting (Gallo-Cajiao et al., 2020). In an assessment of recent developments in waterbird conservation, Yong et al. (2021) found that of 672 Important Bird and Biodiversity Areas identified within South-east Asia, 181 host coastal wetlands cover and 52 at least one globally threatened migratory waterbird. Major knowledge gaps remain, especially in identifying major hot-spots, species-specific habitat requirements and levels of migratory connectivity. However, eliminating knowledge gaps does not guarantee effective conservation interventions, as Pérez-Granados & López-Iborra (2021) reveal with a case study of the conservation research–practice gap involving the Vulnerable Dupont’s lark *Chersophilus duponti* in Spain. There is a mismatch between science and practice, with many interventions with high scientific consensus rarely adopted by managers because of financial and time limitations, legal obstacles or their own perceptions of extinction risk.

These eight studies of birds and their conservation are illustrative of the range of threats facing bird populations at temperate, tropical and polar latitudes and the multifaceted challenges facing conservation practitioners in their hunt for solutions to the loss of avian diversity. These practitioners require access to the best available data on remaining population sizes, and need to address issues pertaining not

only to habitat extent, condition and connectivity, but also to interact with other groups to ensure that any consumptive use of birds does not contribute to ongoing avian biodiversity loss. Birds are one of our best windows on the state of wild nature, and the vast ornithological corpus is brimming with examples of both conservation successes and ongoing failures.

References

- BIRDLIFE INTERNATIONAL (2020) *IUCN Red List for Birds*. datazone.birdlife.org/species/search [accessed 24 January 2022].
- GALLO-CAJIAO, E., MORRISON, T.H., WOODWORTH, B.K., LEES, A.C., NAVES, L.C., YONG, D.L. et al. (2020) Extent and potential impact of hunting on migratory shorebirds in the Asia-Pacific. *Biological Conservation*, 246, 108582.
- JAIN, A., ALOYSIUS, S.L.M., LIM, H., PLOWDEN, T., YONG, D.L., LEE, J.G. & PHELPS, J. (2021) Understanding Singapore’s dynamic parrot trade ecosystem. *Oryx*, 56, 184–194.
- KHAMCHA, D., ANGKAEW, R., PIERCE, A.J. & GALE, G.A. (2021) The Endangered giant nuthatch *Sitta magna*: population size, habitat availability and the implications for its conservation in Thailand. *Oryx*, 56, 195–201.
- MARSHALL, H., GLORIZKY, G.A., COLLAR, N.J., LEES, A.C., MOSS, A., YUDA, P. & MARSDEN, S.J. (2021) Understanding motivations and attitudes among songbird-keepers to identify best approaches to demand reduction. *Conservation Science and Practice*, 3, e507.
- NEWT, J.L., McDONALD, R.A., WOOD, K.A., REES, E.C., SEMENOV, I., CHISTYAKOV, A. et al. (2021) Predicting intention to hunt protected wildlife: a case study of Bewick’s swan in the European Russian Arctic. *Oryx*, 56, 228–240.
- PÉREZ-GRANADOS, C. & LÓPEZ-IBORRA, G.M. (2021) The conservation research–practice gap: a case study of a threatened bird. *Oryx*, 56, 241–248.
- SÁNCHEZ-MERCADO, A., BLANCO, O., SUCRE, B., BRICENO-LINARES, J.M., PELÁEZ, C. & RODRÍGUEZ, J.P. (2021) When good attitudes are not enough: understanding intentions to keep yellow-shouldered amazons as pets on Margarita Island, Venezuela. *Oryx*, 56, 209–217.
- SAVINI, T., SHWE, N.M. & SUKUMAL, N. (2021) Ongoing decline of suitable habitat for the Critically Endangered Gurney’s pitta *Hydrornis gurneyi*. *Oryx*, 56, 202–208.
- SCHEFFERS, B.R., OLIVEIRA, B.F., LAMB, I. & EDWARDS, D.P. (2019) Global wildlife trade across the tree of life. *Science*, 366, 71–76.
- SHWE, N.M., SUKUMAL, N., GRINDLEY, M. & SAVINI, T. (2020) Is Gurney’s pitta *Hydrornis gurneyi* on the brink of extinction? *Oryx*, 54, 16–22.
- SILVA, S., BRAGA, B., BRASIL, L., BAIA-JUNIOR, P. & GUIMARÃES, D. (2021) The use of Passeriformes in the eastern Amazonia of Brazil: culture encourages hunting and profit encourages trade. *Oryx*, 56, 218–227.
- SYMES, W.S., EDWARDS, D.P., MIETTINEN, J., RHEINDT, F.E. & CARRASCO, L.R. (2018) Combined impacts of deforestation and wildlife trade on tropical biodiversity are severely underestimated. *Nature Communications*, 9, 4052.
- UBAID, F.K., SILVEIRA, L.F., MEDOLAGO, C.A., COSTA, T.V., FRANCISCO, M.R., BARBOSA, K.V. & JUNIOR, A.D. (2018) Taxonomy, natural history, and conservation of the great-billed seed-finch *Sporophila maximiliani* (Cabanis, 1851) (Thraupidae, Sporophilinae). *Zootaxa*, 4442, 551–571.
- YONG, D.L., KEE, J.Y., AUNG, P.P., JAIN, A., YEAP, C.A., AU, N.J. et al. (2021) Conserving migratory waterbirds and the coastal zone: the future of South-east Asia’s intertidal wetlands. *Oryx*, 56, 176–183.