

## SHORT COMMUNICATION

## Bird predation by domestic cats on Hahajima Island, Bonin Islands, Japan

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The Bonin Islands are oceanic islands situated in the northwest Pacific Ocean 1,000 km south of the Japanese main island of Honshu. These islands lacked terrestrial mammalian carnivores until human colonization in 1830. Early immigrants introduced domestic cats *Felis catus* to the islands, some of which escaped from the island's residential area. Even by 1877 there were already reports of there being many feral cats on the island (Obana 1877). Cat predation is known to impact native bird populations on various islands around the world, such as the offshore islands of New Zealand and the Canary Islands in the eastern Atlantic Ocean (Fitzgerald & Veitch 1985, Nogales et al. 1992, Powlesland et al. 1995). In the Bonin Islands also, many studies have highlighted the impact of cat predation on native birds (e.g. Tokyo Regional Forest Office 1994, Tokyo Regional Forest Office 1996, Kawakami 2000). Yamashita (1934) supposed that the extinction of endemic birds (such as the Ogasawara Islands Thrush *Turdus terrestris* and the Ogasawara Islands Grosbeak *Chaunoproctus ferreorostris*) in the Bonin Islands was partly caused by predation of increased feral cats. But, no detailed study has been conducted on the diet of feral cats. Cat predation on small birds is considered to be underestimated, because such prey are eaten whole by cats and few visible remains are left after predation (Kawakami 2000).

In order to elucidate the extent of predation on native Bonin Island passerines, we collected, and identified, the feathers of birds eaten by a domestic cat. The cat involved was a free-roaming neutered tabby female about eight years old. The cat brought prey remains, including feathers, to the cat-owner's house in the Okimura area of Hahajima (Haha Island). The

owner collected feathers, at our request, whenever he found them. The collection was conducted from September 1998 to November 1999. The owner was not absent for any prolonged periods during the survey, nor was the collection effort biased seasonally. The remains included not only feathers but also a few torn legs, wings and heads, which were available for species identification. We referred to feather specimens, photos and measurement data to identify the feathers. As the samples included characteristic pieces of various body parts, we were easily able to identify the species concerned. The minimum number of each species estimated from feather samples was recorded. English names and classification follow the Ornithological Society of Japan (2000).

The feathers were identified as belonging to 39 individuals of four species: thirty-one Japanese White-eyes *Zosterops japonicus*, five Bonin Islands Honeyeaters *Apalopteron familiare*, two Siberian Meadow Buntings *Emberiza cioides*, and one Oriental Greenfinch *Carduelis sinica*. The number predated was particularly high during the breeding season probably because of the greater vulnerability of fledglings. Though Brown-eared Bulbuls *Hypsipetes amaurotis* and Blue Rock Thrushes *Monticola solitarius* also occurred on the island they were not found among the remains. As these species are larger than the other four species, the cat may either prey on them less frequently than the other species, or did not bring them to the house. Kawakami (2000) reported that these species and other larger birds were preyed upon by cats. Therefore, it is considered that bulbuls and rock-thrushes are within the normal prey range, but for some reason were not recorded in this survey. The white-eye is an introduced species, now the dominant species in the study area. The honeyeater is endemic to the islands and is classed as a vulnerable species by Birdlife International (2001). The sub-

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species of the greenfinch on the Bonin Islands, *C. s. kittlitzi*, is endemic to the islands and its population is considered to be at most 200 individuals (Tokyo Regional Forest Office 1996). These three species are residents, whereas the bunting is a winter visitor to the islands.

On Hahajima, feral cats have been observed widely in various kinds of habitats, including primary forests. There is no appropriate estimate of their population, however judging by the frequency of detection, there are likely to be more than 100 feral or half-feral cats on the island. The cat we studied was a free-roaming domestic individual fed regularly by its owner, thus its hunting was supplementary to its basic dietary needs. Feral cats are presumed to prey on even more birds. We are unable to estimate the frequency of predation on birds by the study cat, because it did not bring all its prey to the house.

The Japanese White-eye is the dominant species in the study area and was the commonest species represented among the prey remains, indicating that the cat took them in proportion to their availability. As the population density of this species has increased over the last 20 years (Kawakami, K. unpublished data), the impact of cat predation on it is not deemed critical. Predation by cats is a serious problem, however, for the two endangered native passerines—the endemic Bonin Islands Honeyeater, and the endemic subspecies of the Oriental Greenfinch. Since both of these species frequently forage on the ground, they make easy prey for cats. As the total number of the latter is particularly small, the urgent eradication of feral cats is essential as a conservation measure.

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