

Chapter 16

Human-Altered Tree-Based Habitats and Their Value in Conserving Bird and Bat Diversity in Northeast Luzon, The Philippines

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Abstract This chapter discusses the conservation value of smallholder tree-based systems for bird and bat species in the human-altered landscape of the Cagayan Valley, Northeast Luzon. Birds and bats in village homegardens, small *Gmelina arborea* plantations and uncultivated shrub-land were surveyed in 11 localities, using 118 point counts for birds and 34 mist-net-lines for bats. A total of 1,093 individual birds were observed representing 58 resident bird species, including 11 species endemic to the Philippines, 15 forest bird species and one globally threatened species. A total of 409 bats were captured belonging to 16 species, including five endemics, five forest bat species and also one globally threatened species. *Gmelina* forest plantations held slightly more forest bird species than homegardens and surrounding shrub-land. However, the human-altered landscape fails to serve as an alternative for closed-canopy forest habitat containing only 13 percent of lowland forest birds, 15 percent of endemic lowland birds and eight percent of threatened lowland birds known to occur in the region. For bats, human-altered habitats offer slightly better conditions, containing 44 percent of all lowland bats, 42 percent of endemic bats and 29 percent of forest bats in the region. Most forest birds and bats were restricted to a narrow zone bordering contiguous forest. Reforestation through mono-culture *Gmelina arborea* plantations is of little direct value to bird and bat conservation but it could act as a catalyst for forest recovery. Better structured, diverse and interconnected homegardens and forest plantations potentially have higher conservation values for birds and bats.

Keywords Biodiversity conservation, ecosystem services, endemic species, exotic tree plantation, homegardens, off-park conservation

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16.1 Introduction

Traditionally, ecologists and conservationists have focused their attention on wilderness areas, such as large undisturbed protected forest areas, in their attempt to conserve tropical biodiversity (Bruner et al. 2001). However, while deforestation continues, there is concern that the remaining forest areas will not be large enough to conserve the original tropical forest species diversity (O’Riordan and Stoll-Kleeman 2002).

Consequently, more attention has been given in recent years to the role of human-altered landscapes and off-park conservation in sustaining tropical biodiversity (Hughes et al. 2002; Petit and Petit 2003; McNeely 2004; Atta-Krah et al. 2004; McNeely and Schroth 2006). Agroforestry and other tree-based land use systems are considered highly relevant within this context as they may offer a suitable habitat for a range of forest species (McNeely and Schroth 2006). Moreover, these systems also provide economic benefits in terms of local livelihoods and farmers’ income, and environmental services such as watershed protection and carbon sequestration. The integrated ecosystem approach advocated by the Convention on Biological Diversity seeks such combinations of rural development and the conservation of ecosystem services and biodiversity (Garrity 2004; McNeely 2004; McNeely and Schroth 2006).

Within a Southeast Asian context, relatively few studies have been published on biodiversity in human-altered landscapes (Peh et al. 2006) though recently a number of studies compare forest bird species richness between various agro-ecosystems and natural forest (Thiollay 1995; Waltert et al. 2004; Peh et al. 2005, 2006; Sodhi et al. 2005; Marsden et al. 2006; Round et al. 2006). To our knowledge no study has yet been published on birds and bats in agro-ecosystems in the Philippines.

16.1.1 *Deforestation and Threatened Biodiversity in the Philippines*

The Philippines has lost most of its original forest since 1900 (Kummer 1992). The current forest cover (FAO 2007) is 71,620 km² (24 percent of land area) with an annual deforestation rate of 2.1 percent in the period 2000–2005 (see also Chapter 1, this volume). Geographic isolation and specific local circumstances drove a process of local evolution which resulted in large numbers of endemic species restricted to islands and island groups in the Philippines (Heaney 1986). Of the world’s plant and vertebrate species, 1.9 percent is endemic to (one of) the 7,100 islands of the Philippines (Myers et al. 2000). Endemism levels within the Philippines vary from 31 percent of all bird species (Kennedy et al. 2000) to 78 percent of currently known amphibian species (IUCN and Conservation International and NatureServe 2006). As Philippine endemic species primarily evolved in forest they are considered to be forest specialists and as such vulnerable to deforestation. The loss of original habitat, in combination with the high proportion of global biodiversity restricted