

Habitat Selection of the Cooperative Breeding Taiwan Yuhina (*Yuhina brunneiceps*) in a Fragmented Forest Habitat

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Pei-Fen Lee, Sheng-Feng Shen, Tzung-Su Ding, Chyi-Rong Chiou, and Hsiao-Wei Yuan (2005) Habitat selection of the cooperative breeding Taiwan Yuhina (*Yuhina brunneiceps*) in a fragmented forest habitat. *Zoological Studies* 44(4): 497-504. We used multilevel analyses (individual habitat selection and population structure) to study edge effects on the Taiwan Yuhina (*Yuhina brunneiceps*), an endemic subtropical species at Meifeng, central Taiwan. The 95% kernel home range area was used to study habitat preferences, and the source-sink threshold was calculated to determine whether this yuhina population is self-sustainable. Within the study site, woods, open spaces, orchards, buildings, and pond habitats were preferred in that order. Within the home ranges, orchard habitats were preferred to open spaces. Larger breeding groups had larger home ranges with more trees and open spaces. Nest sites were closer to forest edges than random points were. The density of Taiwan cherry trees was significantly higher within home ranges than available areas, especially near edges, suggesting the fruit's potential value to breeding yuhinas. Although the yuhinas suffered high rates of nest failure at Meifeng, this population still seemed to be self-sustaining due to the long breeding season with multiple broods and a cooperative breeding strategy. <http://zoolstud.sinica.edu.tw/Journals/44.4/497.pdf>

Key words: Edge, Fragmentation, Home range, Source-sink population dynamics.

Habitat fragmentation and habitat loss are considered major threats to biodiversity (Wilson 1992). One unavoidable consequence of habitat fragmentation is an increase in edge habitats, which in turn affects abiotic and biotic processes in the landscape (Murcia 1995). Nesting birds may disproportionately favor the edges of forest patches due to the availability of forest cover and abundant food, but may suffer high nest predation as a result. Therefore, edges may become "ecological traps" leading to severe population declines in edge-nesting species (Gates and Gysel 1978).

The effects of habitat fragmentation are not homogeneous. There are species-specific responses (e.g., Warkentin et al. 1995, Bourque

and Villard 2001, Flaspohler et al. 2001), guild-specific responses (e.g., Stouffer and Bierregaard 1995), and, theoretically, life history-specific responses (e.g., Donovan and Thompson 2001) to edge habitats. How individuals perceive patchiness and how they move among fragments influence how they are affected by fragmentation (Wiens 1994, Ims 1995, Andreassen et al. 1998). Therefore, understanding the pattern of habitat selection, together with the behavioral basis for the selection, can help explain variations in edge effects. Few studies have combined individual-level mechanisms with a population-level demographic structure. Even fewer, if any, multilevel studies have been conducted in tropical and sub-

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