Applying Artificial Neural Network on Modelling Waterbird Diversity in Irrigation Ponds of Taoyuan, Taiwan

方偉達,陸國先,朱宏杰,鄭百佑
Leisure and Recreation Management
Tourism
wtfang@chu.edu.tw

Abstract

Irrigation ponds, or pi-tang in Chinese, are defined as an artificial construction made to impound water by constructing a dam or an embankment, or by excavating a pit or dugout. Some ponds at both microhabitat and the landscape scales may be a relevant influence for explaining bird communities due to a habitat effect or more-moderate and complex effects. These ponds, regarding as wintering waterbird refuges, represent some of the multi-functional dimensions in the restoration results of agro-ecosystems. Previous studies detected that causes of species diversity are affected by habitat heterogeneity. According to habitat selection as bio-choices, irrigation pond patterns associated with various microhabitats provide environmental clues that are used by birds to select stopover sites, such that ponds within the range of avian communities may potentially remain unoccupied or under-occupied if they lack those clues. Therefore, the appropriate microhabitats for a particular species in a guild might not be spatially constant if the habitat status changes the distance to the edge between pond cores to peripheral habitats, i.e., by water-table drawdown, farmland consolidation, or other anthropogenic influences. Pond-species relationships, thus, are connected like a neural network with a non-parametric nature, as clues suggest.

Keyword：ANN, farm pond, Taoyuan