不同類型靜水域生態特性差異探討

Exploring the Differences in Ecological Characteristics of Different Types of Pools

經濟部水利署水利規劃分署

正工程司	工程員	助理研究員
顧玉蓉	林姿君	王志元
Yuh-Rong Guh	Tzu-Chun Lin	Chih-Yuan Wang

摘　要

滯洪池為常見之水利工程設施，為確保其具有可靠之滯洪量體及操作之有效性，滯洪池堤岸多設計為剛性或高度人工化的結構物。然而，多數情況下水陸域交界的生態交會區(ecotone)具有較多的生態種類及較豐富的生物相，而滯洪池剛性堤岸則減損生態交會區生態功能。

本研究參考臺灣地理氣候分區於中西區(CW)選取高度人工化之滯洪池及天然埤塘各 1 處，針對周邊植被進行植相及土壤特性(立地條件)進行調查與分析，以瞭解不同水岸植物多樣性之差異。植相調查於濕季及旱季各進行 1 次調查，並分別於 2 研究樣區各設置 3 條調查樣線，每樣線依垂直水岸之坡向設置帶狀橫截樣區，調查樣區內的灌木、草木植物種類及覆蓋度，並依所得資料計算植物重要值及歧異度。土壤調查於濕季進行 1 次採樣，於 2 研究樣區採取 6 個 600~800 公克一般土壤樣本及 2 個土環樣本進行檢驗。

根據相關文獻及本案調查資料顯示，植被與土壤特性及植被與水域距離具有顯著的關聯。建議在不影響水利工程安全及功能需求的基礎條件下，依據區位周邊生態條件，嘗試在適合的區位，利用保留部分植被演替區域之方式，作為增加植被多樣性及改善土壤條件之生態補償措施，並可進行相關條件監測以確認成效。

關鍵詞: 滯洪池、天然埤塘、土壤特性、植被、生態補償

Abstract

Detention basins are common hydraulic engineering structures designed to ensure reliable flood detention volume and effective operation. Typically, the embankments of detention basins are constructed with rigid or highly artificial structures. However, in most cases, the ecotone, or the transitional zone between aquatic and terrestrial areas, hosts a greater variety of ecological species and richer biodiversity. The rigid embankments of detention basins, however, diminish the ecological functions of these ecotones.

This study selected one highly artificial detention basin and one natural pond in the Central-Western (CW) region of Taiwan, based on the geographical and climatic divisions of the area. The vegetation and soil characteristics around these pools were investigated and

analyzed to understand the differences in plant diversity along different types of shorelines. Vegetation surveys were conducted once each during the wet season and the dry season. In each of the two study areas, three survey transects were established. Along each transect, belt-shaped cross-sections were set up perpendicular to the shoreline to examine the species and coverage of shrubs and herbaceous plants within the survey areas. Based on the collected data, the importance values and diversity indices of the plants were calculated. Soil sampling was conducted once during the wet season. In each of the two study areas, six general soil samples weighing 600-800 grams each and two soil ring samples were collected for analysis.

According to relevant literature and the data collected in this study, vegetation and soil characteristics, as well as the distance between vegetation and pools, have a significant correlation. It is advisable to, without compromising the safety and functional requirements of hydraulic engineering, utilize suitable locations based on surrounding ecological conditions. This approach can serve as an ecological compensation measure to increase vegetation diversity and improve soil conditions. Additionally, relevant condition monitoring can be conducted to confirm the effectiveness of these measures.

Keywords: Detention basins, natural ponds, soil conditions, vegetation, ecological compensation.