

# 南水分署協力臺灣鳥類地圖計畫與被動式 聲學監測初探

## Southern Region Water Resources Branch in Collaboration with the Taiwan Bird Atlas with Passive Acoustic Monitoring

漢林生態顧問有限公司	經濟部水利署南區水資源分署		
經理	研究員	正工程司	科長
宋心怡	李姮蓓	蕭軒梅	林玄忠
Hsin-Yi Sung	Heng-Chain Li	Hsuan-Mei Hsiao	Shiuan-Jung Lin

### 摘要

經濟部水利南區水資源分署（以下簡稱南水分署）於 114 年參與臺灣鳥類地圖計畫（Taiwan Bird Atlas），協力農業部生物多樣性研究所與中華民國野鳥學會，於轄區管理範圍內 3 處水庫及 2 處攔河堰，設置 7 處錄音設備，透過被動式聲學監測（Passive acoustic monitoring, PAM），掌握管理區域鳥類生態資源，接軌臺灣生態指標監測工作。

經冬季 2 月及春季 5 月，完成 2 季次調查，共記錄 77 種鳥類。被動式聲學監測，於夜行性的鴟鴞科、隱密性高的雉科等類群，可補充人力偵測之不足，並呈現水利設施周邊棲地環境特性。然而，我們也發現聲學監測於特定物種的限制，如高屏堰關注物種-草鴉，在樣站周邊棲架調查有記錄，但錄音未偵測；曾文水庫的關注物種-山麻雀，現場人員有觀察到活動，音頻分析有鑑定辨認，但因其鳴聲難與麻雀區分，未能通過最終人工資料複核。

被動式聲學監測易於操作且資料有長久保存與應用性，有成為長期生態監測方法之潛力。但被動式聲學監測於特定鳥種可能偵測率受限，且無法取得生物行為觀察資訊，尚無法完全取代生態專業人員現場調查。建議如管理區域有發展長期生態監測之規劃，應先確認監測目的與目標，搭配適當生態調查方法執行。

關鍵詞：鳥類地圖，被動式聲學監測，生態長期監測

### Abstract

The Southern Region Water Resources Branch (WRASB), Water Resources Agency, participated in the Taiwan Bird Atlas project in 2025. In collaboration with the Taiwan Biodiversity Research Institute and the Taiwan Wild Bird Federation, we installed seven recording devices across three reservoirs and two weirs. Using passive

acoustic monitoring (PAM) to conduct bird survey and join the ecological indicator collecting in Taiwan at the same time.

Over two seasonal surveys in February and May, we had recorded 77 bird species. PAM can compensate for the limitations of on-site observers, particularly for detection in nocturnal species such as owls (Strigidae), and elusive species such as pheasants (Phasianidae). The species composition observed also reflected the habitat characteristics around hydraulic infrastructures. However, the study revealed certain limitations of PAM. For instance, the Eastern Grass Owl, a flagship species at the Gaoping River Weir, was observed through perch monitoring but was not detected by the sound recorder. The Russet Sparrow, a species of concern at Zengwen Reservoir, was spotted by field observation and identified by the analysis system, but due to its vocal similarities with Eurasian Tree sparrows, it did not pass data verification by manual review.

PAM is easy to operate and holds potential for long-term regional ecological monitoring. Data collected are available for reanalysis and extended application. Nevertheless, it has limitations in detecting certain species and lack of behavioral observations. We notice that PAM cannot fully replace on-site surveys in the field. It is essential to assess the purposes and targets of ecological monitoring programs, and to combine different ecological survey methods to complement one another.

Keywords: Taiwan Bird Atlas, passive acoustic monitoring (PAM), long-term ecological monitoring