

台灣海峽烏魚的分佈和海洋環境條件

Grey Mullet Distribution in the Taiwan Strait in terms of Oceanographic Conditions

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摘要

台灣海峽烏魚數量的下降引起了人們對其保育工作的關注，為了使這些措施更加有效，了解該物種的特定棲地偏好，尤其是環境變化至關重要。我們利用棲地適合度建模來研究烏魚的分佈模式。泛加成模式(GAM)分析顯示，對烏魚有較高捕獲率的最佳環境條件為海表水溫在16至26°C之間，海表鹽度在34.2至34.7 PSU之間。使用算術平均模式(AMM)之棲地適合度指數(HSI)進一步檢查，發現烏魚的單位努力漁獲量(CPUE)的變化主要受海表水溫之影響，烏魚喜歡的海洋環境條件稱為「熱點」，其特徵是海表水溫在19至23°C之間，海表鹽度在34.4至34.7 PSU之間。這些發現與GAM模式的結果一致，相關係數高達 0.925。本研究結果將有助於了解此物種，而這裡使用的方法也可應用於其他魚種。

關鍵字：烏魚、泛加成模式、棲地適合度指數、台灣海峽

Abstract

The decline in the grey mullet population in the Taiwan Strait has sparked interest in conservation efforts. To make these initiatives more effective, it's important to understand the specific habitat preferences of the species, especially environmental changes. We used habitat suitability modeling to investigate the distribution patterns of grey mullet. The Generalized Additive Model (GAM) analysis showed that the best environmental conditions for higher catch rates of mullet are characterized by sea surface water temperatures between 16 and 26 °C and sea surface salinity levels between 34.2 and 34.7 PSU. Further examination using the Arithmetic Mean Model (AMM) Habitat Suitability Index (HSI) revealed that variations in mullet's catch per unit effort (CPUE) are mainly influenced by sea surface water temperature. Mullet prefers marine environmental conditions called "hot patches," characterized by sea surface water temperatures between 19 and 23°C and sea surface salinity between 34.4 and 34.7 PSU. These findings align with the results of the GAM model, which shows a correlation coefficient of up to 0.925. The findings of this study will help in understanding this specific species, and the approach used here may also be relevant to other fisheries stocks.

Keywords: grey mullet, generalized additive model, habitat suitability index, Taiwan Strait