Abundance and distribution information of fish resource in Shihmen Reservoir by acoustic surveys

Yu-Shan Hung, Hsueh-Jung Lu, 朱達仁
Leisure and Recreation Management
Tourism
tajen@chu.edu.tw

Abstract

Shihmen Reservoir with 200 million m3 of water-holding capacity is a multifunctional reservoir in northern Taiwan, including tourism, electricity generation, water supply and fishery. To keep water clear and to increase fishery resources, each year the authority release about 400 thousand fries into the reservoir, mainly shellfish, plankton and grass cleaner such as black carp (Mylopharyngodon piceus), Grass carp (Ctenopharyngodon idella) and Bighead carp (Aristichthys nobilis). These fish are beneficial to fishermen and tourism business because of their high economic values. However, overall abundance and distribution information of the release fish are difficult to known therefore the present fishery management may be problematic. This study conducted three acoustic surveys (winter, spring and summer during 2010~2011) using Simrad EY60 split-beam echosounder (200KHz) to obtain bottom topographic and carp distribution information. Based on the topographic information from the echosounder, more than 65% of large carps (> -35.8 dB) were found less than 10m above bottom and relatively high abundance were located at rugged terrain zone in the reservoir. Hence, the bottom condition is an important factor affecting habitat of large carps. They preferred staying in upstream part of the reservoir where mud was less silted up than the downstream part. In dry season (May), the volume of water was extremely different between upstream and downstream, leading to high spatial variability of fish density. Estimated average density for each season was 0.00359, 0.002898 and 0.006667(fish/m3) in abovementioned order of winter, spring and summer. The density estimated by acoustic survey was of high fluctuations which didn't agree with the volume effect caused by capacity differences between dry and monsoon seasons. The study also discussed the possible reason behind and management recommendation.

Keyword：Shihmen Reservior, Acoustic survey, Target strength