

## The Evaluation of Fishing Effect on the Fish Population Size in a Small Stream

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### Introduction

Fish population was strongly affected by natural environmental changes as well as human activities (over exploitation, introduction of exotic species, habitat alteration, population). These human induced stresses result in greatly accelerated rates of extinction and other apparently irreversible changes. Except for the commercially important species, study on the changes of fish population was limited in long term environmental research. In South Korea, fish population investigation was conducted as a part of fish faunal study. Although we recognize ongoing fish population change in stream ecosystems in South Korea, we do not know the factors involved. In this study, through the analysis of the fish individual size class, the affect of over-exploitation was evaluated and management of fish community in small mountain stream systems was considered.

### Material and Methods

An eleven sampling for capture and recapture was conducted at Chulma (Busan) stream from July, 2001 to February, 2002. Physico-chemical parameters(discharge, temperature, pH, etc) were measured at the sampling sites. Fish were collected with a scoop-net (mesh 5.5 mm) and cast nets (mesh 7.7 mm). The tagging system for this experiment was the Visible Implant Fluorescent Elastomer (VIE) hand injection kit (Northwest Marine Technology®). We used injector for VIE injection to 10 species marking into the preopercle at the sampling site. We detected VIE in the recaptured fishes under U.V. light. After tagging, collected specimens were released to the original habitat for the capture-recapture experiment. All specimens were identified according to guideline suggested by Choi *et al.* (1990) and the

classification system of Nelson (1994).

## Results and Discussion

When we investigated fish stock using the capture-recapture methods in the Chulam stream, dominant species was *Zacco temmincki* (12,642 ind; RA, 68.4%), *Zacco platypus* was subdominant species (2,912 ind; 17.3%). Even though we released all of fish we caught, there was a recognizable change of the individual fish size class. Many of adult fish existed in July. However we hardly caught adult fish in September. Through the change of fish size class from July to September, we suspect there is a strong over exploitation in this stream (Fig.). Although study site, Chulma, was well protected area for drinking water supply by the local government, the fish community suffer illegal fishing activities. This result might indicate that fish populations in small mountain stream in South Korea were strongly affected by over-exploitation more other environmental change. Therefore, establishment of protected segment of stream system is strongly required for the conservation of freshwater fish biodiversity in South Korea.

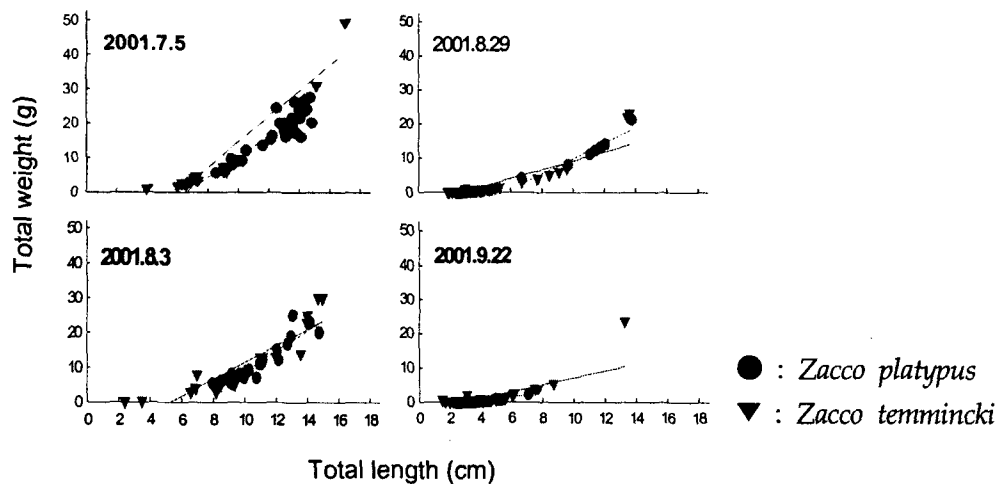


Fig. Changes of individual size class between two species

## Reference

- Holmgren, K., Appelberg, M., 2000. Size structure of benthic freshwater fish communities in relation to environmental gradients. *Journal of Fish Biology*.
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