

## The Role of Riparian Vegetation in the Environment of Masu Salmon Juveniles, *Oncorhynchus masou*

Mitsuhiro Nagata<sup>1</sup>, Hirokazu Sato<sup>2</sup>, Mahito Miyamoto<sup>1</sup>, Shin-ichi Ohkubo<sup>1</sup>,  
Seiji Yanai<sup>2</sup>, Yu Nagasaka<sup>2</sup>, Tomoya Aoyama<sup>1</sup>,

Tatsuya Takami<sup>1</sup>, Hiroshi Kawamura<sup>1</sup> and Hiroshi Kawamura<sup>1</sup>

<sup>1</sup>Hokkaido Fish Hatchery, Kitakashiwagi-3, Eniwa,

Hokkaido, 061-14 Japan

<sup>2</sup>Hokkaido Forestry Research Institute, Higashiyama, Koshunai, Bibai

Hokkaido, 079-01 Japan



Much riparian vegetation in Hokkaido has been lost due to logging and construction activities. However, little is known how these activities influence habitat quality for masu salmon and their growth and survival. Shakotan River in midwestern Hokkaido was straightened to control floods in the middle reaches twenty years ago. As a result, riparian vegetation was lost from the streamside area. Fortunately, some of the riparian vegetation has recovered. The aim of this study was to estimate influences of a loss of riparian vegetation on stream temperature, and resultant consequences on growth and survival of masu salmon juveniles. Five study stations were established along the straightened stream to monitor changes in stream temperature, growth, condition factor and population density of juvenile masu salmon in 1994 and 1995. Stns. 0 (1995 only) and 1 were located in the upper reach where overhead tree cover varied between 30 and 60%. Stn. 2 was in the middle reach where there were

few riparian trees and overhead cover from grass was less than 15%. Stns. 3 and 4 were in the lower river with tree cover between 40 and 90%. The 1994 summer was so hot that stream temperature exceeded 20°C at Stns. 2, 3 and 4. Stream temperatures rose most rapidly in the middle reach with the least overhead cover. In contrast, the 1995 summer was cool and stream temperatures in Stns. 2-4 rarely exceeded 20°C. Masu salmon juveniles at Stns. 2-4 almost stopped growing, and their condition factor and population density also decreased from July to August in 1994. In contrast, masu salmon juveniles at Stns. 2-4 continued to grow and their condition factors rose from July to August in 1995. Furthermore, summer decreases in population density in this year were not higher than those in 1994. These results suggest that overhead cover by riparian vegetation contributes to maintaining low summer stream temperatures which enables rapid growth of masu salmon juveniles during the summer.