

Seagrass Bed Restoration by Fishermen at Hinase in Japan

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Abstract

Habitat rehabilitation which is very important for fishery resources enhancement should be conducted following the community-based management and ecosystem-based management. In Japan, the *Satoumi* concept is introduced as one of integrated coastal management concepts for habitat rehabilitation. Fishermen at Hinase Fishermen Union in Japan began the eelgrass bed restoration activity in 1985, when the area of eelgrass bed decreased to 80 ha from 590 ha in 1945, and have continued such activity until now. The area of eelgrass bed recovered 200 ha and fish catch by set net also recovered in 2011. The fishers' group began the oyster culture in the same fishery ground around 1985. Together with the expansion of eelgrass bed, the harvest of oysters had increased because the eelgrass bed and oyster culture have the win-win relation, that is, the oyster culture helps the expansion of eelgrass bed by the assimilation of detritus and increase sun light transmittance depth, and the eelgrass bed helped decrease the mortality of cultured oysters in summer by lowering water temperature in the water column. Moreover the Hinase Fishermen Union plans to establish a fish farm by combining eelgrass bed, oyster culture in rafts and artificial reefs arrangement, that is, the spawned local fish grows in the designated farming area using eelgrass bed, oyster raft and artificial reef, resulting in increased fish harvest.

Keywords: eelgrass bed, oyster culture, fish farm

Activities

Seagrass bed restoration was carried out in Hinase of Seto Inland Sea, Japan. This activity was aimed at enhancing the already degraded eelgrass bed which had decreased from 590 ha in 1945 to 82 ha in 1965, and then to 12 ha in 1985. Many factors have led to such deterioration, which included occurrence of typhoon; turbidity of the water due to human activities on land as well as in rivers and coasts; chemicals from farms in land. As a result, fish catch from set net had also decreased.

Results

In order to enhance the status of eelgrass in Hinase, concerned fishers started the restoration activity in 1985, which was continued for 30 years. In 2011, the eelgrass bed was found to increase to 200 ha, about 1/3 that of 1945. As a consequence, catch from set net had also increased.

In the restored eelgrass bed, oyster culture was started in 1963 which had expanded in 1980s. From such activity, the fishers are able to produce the famous Okayama Oyster brand starting in 1996.

There exists a win-win relationship between oyster culture and eelgrass bed. While the eelgrass facilitates decrease in water temperature (from leaves of eelgrass) this has led to decreased mortalities of the oysters.



Moreover, the attached diatoms and small animals on leaves of eelgrass also contributed to increased growth rate of the oysters.

Eelgrass bed is known to have many functions. It serves as nursery of juveniles especially rock fishes; decreases water temperature from shading effect of eelgrass leaves; promotes water purification due to assimilation of nutrients through the eelgrass roots; produces oxygen and decreases CO₂ emission from photosynthesis; provides food for fishes from diatoms, polychaetes, and other small animals that attach on eelgrass leaves; and facilitates distribution of nutrients. Due to the slow decomposition property of eelgrass, there is no pollution from the water of origin.

In May 2012, the Agreement for Hinase Fisheries was forged by concerned stakeholders, such as the Fishermen's Union, Okayama Prefecture, Okayama COOP, and Research Institute for Sato-umi Creation. The agreements included provision on the adoption of integrated coastal management

based on the Sato-umi concept. As a new concept for coastal area management, Sato-umi aims to create a coastal sea with high biodiversity and productivity under human interaction. There are now 12 areas in Japan that have been created by Japanese fishers following the Sato-umi concept.