

Fish assemblages associated with three types of artificial reefs: Density of assemblages and possible impacts on adjacent fish abundance

Abstract

We evaluated the effectiveness of wooden artificial reefs (ARs) as fish habitat. Three types of ARs, made of cedar logs, broadleaf tree logs, and PVC pipes, respectively, were deployed in triplicate at 8-m depth off Maizuru, Kyoto Prefecture, Sea of Japan, in May 2004. Fish assemblages associated with each of the nine ARs were observed by using SCUBA twice a month for four years. Fish assemblages in the adjacent habitat were also monitored for two years before and four years after reef deployment. In the surveyed areas (ca. 10 m²) associated with each of the cedar, broadleaf, and PVC ARs, the average number of fish species was 4.14, 3.49, and 3.00, and the average number of individuals was 40.7, 27.9, and 20.3, respectively. The estimated biomass was also more greater when associated with the cedar ARs than with other ARs. Visual censuses of the habitat adjacent to the ARs revealed that the number of fish species and the density of individuals were not affected by the deployment of the ARs. Our results support the superiority of cedar as an AR material and indicate that deployment of wooden ARs causes no reduction of fish abundance in adjacent natural reefs.