

STOCK ENHANCEMENT AND FISHERIES MANAGEMENT OF THE JAPANESE FLOUNDER IN FUKUSHIMA, JAPAN

Takeshi Tomiyama*, Masato Watanabe and Tsuneo Fujita
Fukushima Prefectural Fisheries Experimental Station
Onahama, Iwaki 970-0316, Japan
tomiyama_takeshi_01@pref.fukushima.jp

Hatchery-reared Japanese flounder *Paralichthys olivaceus* have been released around almost the entire coast of Japan. In Fukushima Prefecture, more than 200,000 flounder fingerlings were released annually between 1987 and 1995, and good rates of survival were confirmed through surveys of catches at fish markets. As a result, one million juvenile flounder have been released annually in stock enhancement programs along ~130 km of coast in Fukushima Prefecture since 1996. A community-based management system is used for this flounder fishery, in which fishers pay 5% of their annual landings to operate the stock enhancement program. Also, since 1993, fishers have consented to retain only flounder ≥ 30 cm total length to maximize economic gains from the investment in stock enhancement.

Released flounder now contribute an additional 30–90 tons to the catch (Figure 1). However, the economic efficiency of stock enhancement - the value of landings from released fish compared to the cost of juvenile production and release - has recently been far lower than that recorded between 1987 and 1995. This is attributed to a reduction in the recapture rate and in the fish price due to an economic depression.

A feature of this fishery is that the population dynamics of wild flounder were not considered during the implementation of the stock enhancement program. In particular, the occurrence of a strong year class of wild flounder approximately every 10 years (Figure 1) has not been considered. When this happens, there is a dramatic increase in landings. Such a year class occurred in 2005, and eliminated the need to release hatchery-reared juveniles in the short-term. However, we cannot easily terminate the stock enhancement program, which has the support of the fishing community and co-operative associations. This issue raises the need to make the release program more cost-effective. Here we consider the use of hatchery-reared juveniles in fishery management, and socio-economic issues, for the Japanese flounder stock enhancement program in Fukushima Prefecture.

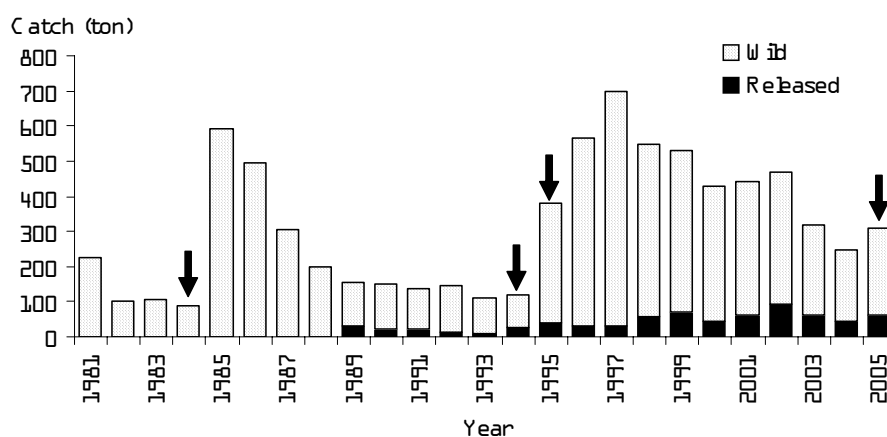


Figure 1. Landings of the Japanese flounder in Fukushima Prefecture. Arrows denote occurrences of dominant year classes of wild juveniles.