

Overview on the stock enhancement in Japan

Peer Review Meeting for Japanese Fish Stock Assessment

7-10 November 2023

Background of “stock enhancement”

- ▶ This explanation is provided to make clear the unique system of Japanese fisheries including stock enhancement.
- ▶ The general aim for this assessment is management of resources, including both wild and released fish.
- ▶ The details of stock enhancement are stated in “Basic policy on the production and release of aquatic animal seeds, and rearing of aquatic animals” and stock enhancement is planned and conducted by local governments regarding the policy.
- ▶ This Basic Policy is established by the Minister of Agriculture, Forestry and Fisheries based on the “Coastal Fisheries Grounds Enhancement and Development Program Act”

Background of “stock enhancement”

- ▶ **Description in the current Basic Policy
(created 7/2022, enforced for FY2022~2026)**
 - ▶ “Stock enhancement aims to contribute the enlargement of the future spawning biomass and catch by releasing hatchery-reared recruitment to the wild-origin recruitment.”
 - ▶ “Transition from stock enhancement to stock management is promoted for a stock that had completed the goal of stock enhancement or is able to sustain its stock level with reduced number of released seeds.”

Fisheries Agency - Organization chart

▶ Resources Management Department

- ▶ Fisheries and Resources Management Division ← TAC management
- ▶ Fisheries Enforcement Division
- ▶ International Affairs Division

▶ Resources Enhancement Promotion Department

- ▶ Resources and Environment Research Division ← stock assessment → FRA and Participating Organizations
- ▶ Research and Technological Guidance Division
- ▶ Fish Ranching and Aquaculture Division ← stock enhancement → NAPPS*

▶ Fisheries Infrastructure Department

- ▶ Planning Division, Construction Division, Fishing Communities Promotion and Disaster Prevention Division

▶ Fisheries Policy Planning Department

- ▶ Administration Division, Policy Planning Division, Fisheries Management Improvement Division, Fisheries Processing Industries and Marketing Division, Director of Fisheries Insurance

*National Association for Promotion of Productive Seas

Assumptions in the stock assessment

► ID of the hatchery-release

- Both **Japanese seabream (JS)** and **bastard halibut (BH)** use unique morphological characteristics to distinguish the hatchery releases from the wild origin, although artificial markers are applied for some cases.

- **JS** : deformity of the internostril epidermis

- **BH** : abnormal pigmentation on the blind side

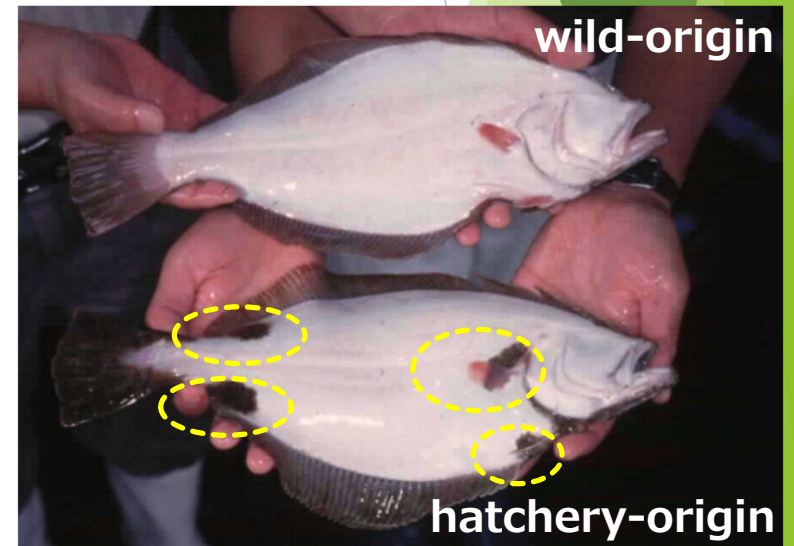


wild-origin



hatchery-origin

Original photographs by T. Shimose



wild-origin

hatchery-origin

survey manual (FRA, 2008)

Assumptions in the stock assessment

▶ Release and survival of the hatchery-released fish

- ▶ Released at age-0, smaller than the size of fishery recruitment
 - ▶ **JS**: Released at 90-120mm TL, mainly June - August
Catch is limited to above 120mm TL from July to September (Seto Inland sea).
 - ▶ **BH**: Released at 50-80mm TL, mainly May - June
Catch is limited to above 250mm TL (Seto Inland sea).
- ▶ Survival to the recruitment is considered as a “survival rate”.
 - ▶ Recruitment of hatchery-releases
= total number of released fish * survival rate
 - ▶ Recent survival rates are approximately 0.01 (**JS** of Seto Inland sea) and 0.1 (**JS** in western Sea of Japan and East China Sea and **BH** in Seto Inland sea), with interannual variability.

Assumptions in the stock assessment

- ▶ **Biological characteristics of the hatchery-released fish**
 - ▶ Assume the biological characteristics are the same as wild-origins
 - ▶ Survive, grow, mature, and caught as same as the wild-origins
 - ▶ No clear evidence has been reported however assumptions are derived from empirical observation such as hatchery-released fish being caught along with the wild origins.
- ▶ **The general aim for the assessment and management**
 - ▶ To manage the resources, including both wild and released fish
- ▶ **Regulations on the stock enhancement**
 - ▶ Not quite
 - ▶ Basic Policy states to “consider the conservation of biodiversity”.