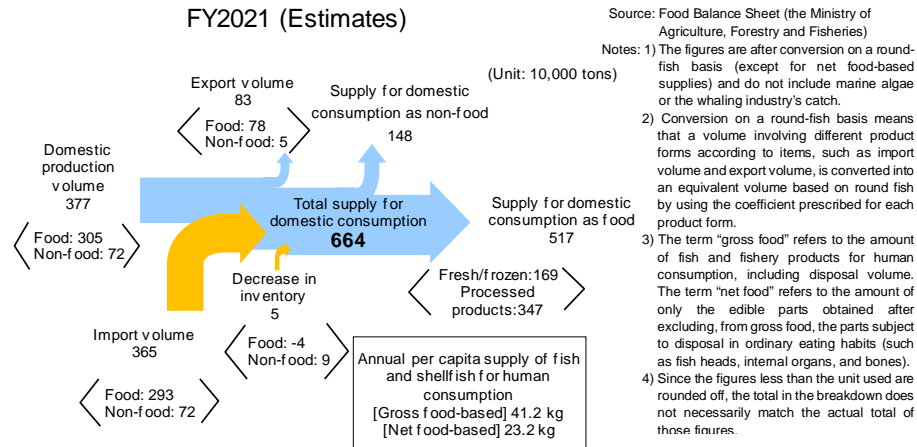


# Chapter 1 Trends in the Supply-and-Demand and Consumption of Fish and Fishery Products in Japan

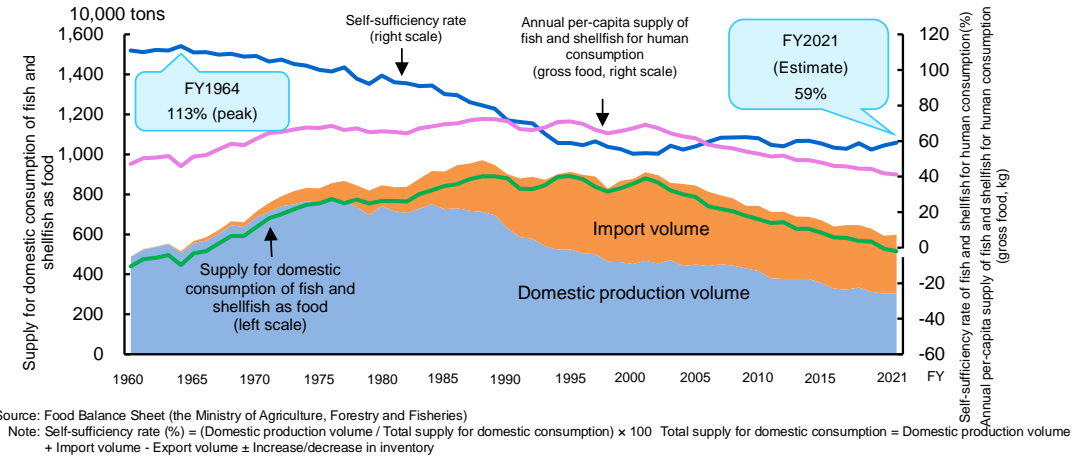
## (1) Supply-and-Demand Situation in Fish and Fishery Products

- The total supply of domestic consumption of fish and shellfish was estimated at 6.64 million tons for FY2021 (converted on a fresh-fish basis, estimates), of which 5.17 million tons (78%) were for human consumption (food) and 1.48 million tons (22%) for feed and fertilizer (non-food).
- The self-sufficiency rate of fish and shellfish in FY2021 was 59% (estimate).

### Japan's Production and Consumption Structure of Fish and Shellfish



### Trends in the Self-Sufficiency Rate of Fish and Shellfish(for human consumption)

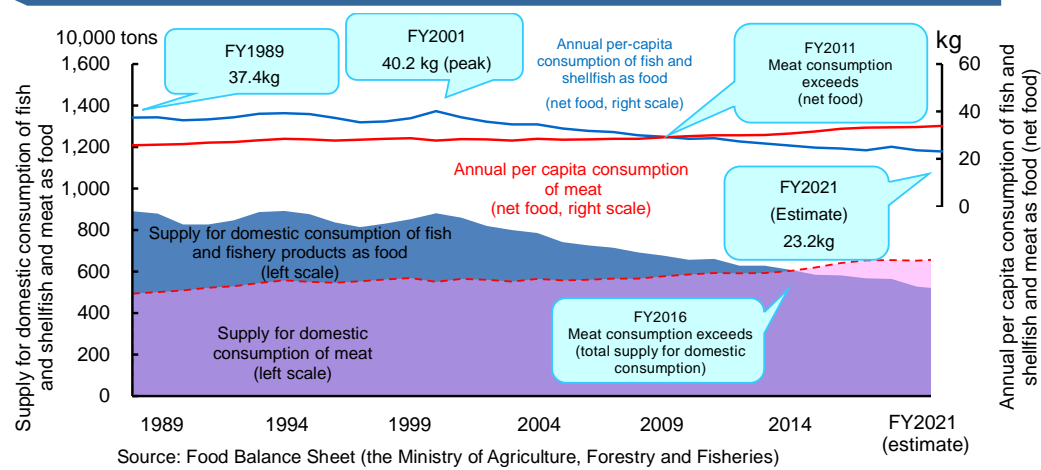


## (2) Status in the Consumption of Fish and Fishery Products

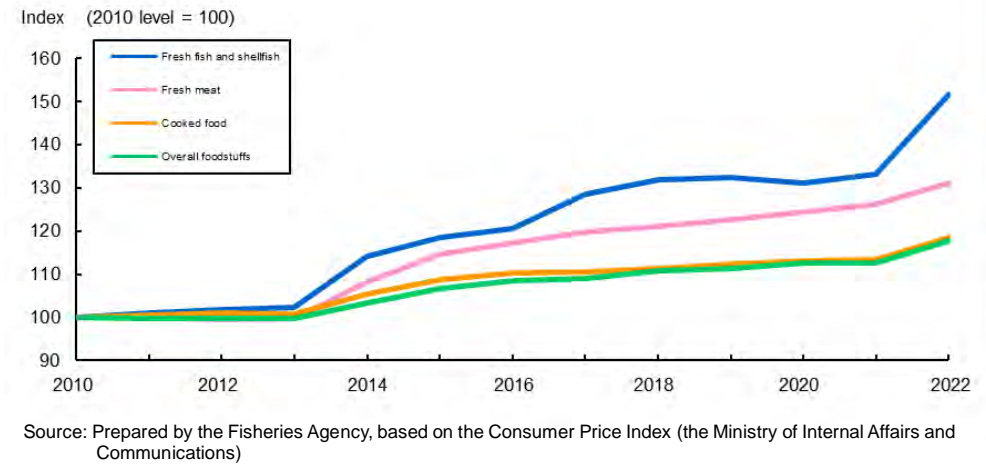
### i. Trends in the Consumption of Fish and Fishery Products

- Annual per-capita consumption of fish and fishery products (net food base) has been on a decreasing trend from the peak of 40.2 kg in FY2001 and lower than meat consumption since FY2011. It was 23.2 kg (estimate) in FY2021.
- The prices of fresh fish and shellfish have risen, and their annual per-capita purchase volume has been on a decreasing trend. In 2022, partly due to the impact of the increased prices of fish and fishery product imports, the Consumer Price Index for fresh fish and shellfish increased by 14% from the previous year, and the annual per-capita purchase volume of fresh fish and shellfish declined by 14%.
- The factors that keep consumers away from purchasing many fish and shellfish include high prices and the time and effort required for cooking. Consumers' orientation is changing with growing orientation toward simplification and convenience in terms of eating.

Changes in Supply for Domestic Consumption and Annual Per-Capita Consumption of Fish and Shellfish for human consumption



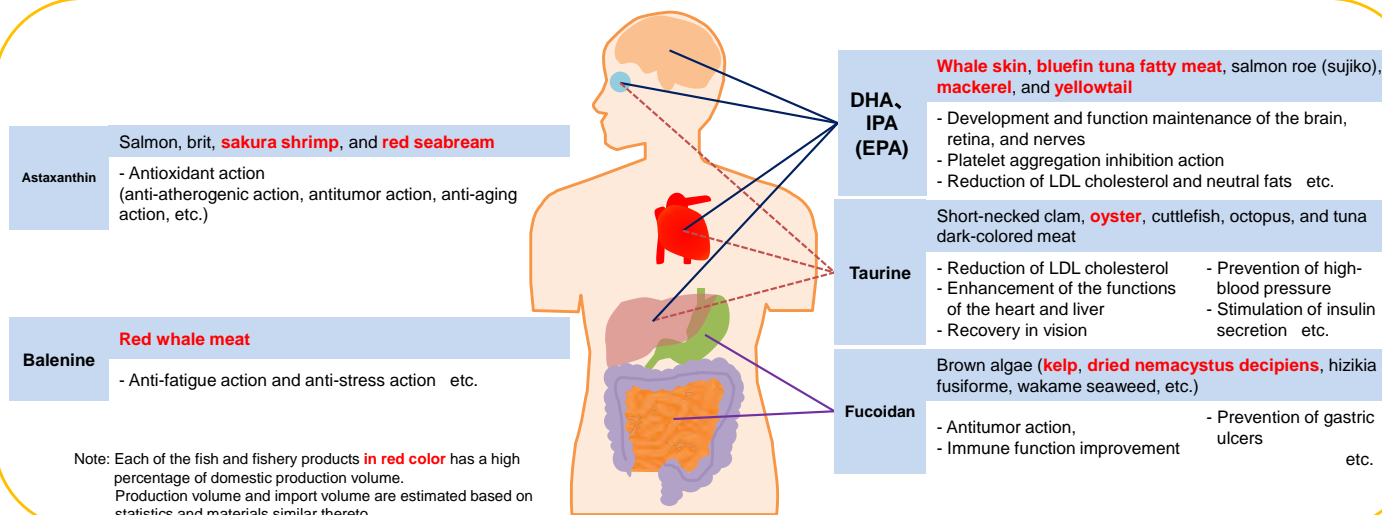
Trends in the Consumer Price Index for Foodstuffs



## ii. Health Benefits of Fish and Fishery Products

- Docosahexaenoic acid (DHA) and icosapentaenoic acid (IPA), which are omega-3 polyunsaturated fatty acids, contained abundantly in the fat of fish and shellfish as well as that of whales, have effects such as promoting the development and function maintenance of the brain, etc., and reducing LDL cholesterol and neutral fats.
- Fish protein is not only a high-quality protein containing a good balance of the nine essential amino acids, which are essential for human life, but also is easily digested and taken into the body compared to soy protein and milk protein.

## Main Functional Components Contained in Fish and Fishery Products



Note: Each of the fish and fishery products in red color has a high percentage of domestic production volume. Production volume and import volume are estimated based on statistics and materials similar thereto.

Source: Prepared by the Fisheries Agency, based on various materials

## Column Effect of Muscle Increase by Intaking of Muscle Protein

The Food Function R&D Center of Nissui Corporation found that APP (Alaska Pollack Protein), which is a protein contained in Alaska pollack, has as its functionality a "muscle hypertrophy effect equivalent to intensive physical exercise," inducing muscle hypertrophy (particularly for fast muscle) without concurrent exercise intervention. This research result led to the commercialization of a product series "Sokkin-tanapaku (Fast Muscle Protein)," and thereby the company won the Minister of Agriculture, Forestry and Fisheries Award of the 2022 (23rd) Commendation of Private-Sector Contributors to R&D in Agriculture, Forestry and Fisheries.



Logo of Sokkin-tanapaku (Nissui Corporation)

### iii. Approaches to Expansion of Consumption of Fish and Fishery Products

- Approaches taken include the provision of fish according to consumer needs through such services as face-to-face sale and pretreatment; and direct selling through the Internet.
- The Fisheries Agency has supported value chain approaches based on cooperation among parties involved in production, processing, distribution, and sale, such as efforts to improving distribution and reducing costs and high added value.
- Activities actively conducted in recent years include the development of school meals using fish and shellfish centrally by fishers, processors/distributors, etc.; and the promotion of fish-eating by fishers personally making visits to deliver lessons.
- The Fisheries Agency designated the 3rd day to 7th day of each month as “*sakana no hi* (fish day),” for the promotion of public and private approaches to expansion of consumption of fish and fishery products.

#### Column The 3rd Day to 7th Day of Each Month as “Fish Day” to Eat Fish

In the promotion of public and private approaches to expansion of consumption of fish and fishery products, the Fisheries Agency has designated the 3rd day to 7th day of each month as “*sakana no hi* (fish day)” and the 3rd day to 7th day of November as “*ii sakana no hi* (good fish day)” to treat these periods as the weeks to reinforce activities toward expansion of consumption of fish and fishery products. Companies and other organizations supporting the fish day (726 companies, etc.; as of the end of March 2023) implement their approaches related to the expansion of consumption of fish and fishery products on the fish day as supporting members. In addition, a fish day kickoff event to disseminate information on the fish day was held within the “8th Fish-1 Grand Prix” event (organized by the National Federation of Fisheries Co-operatives Associations) held in November 2022.



Fish day kickoff event (the 8th Fish-1 Grand Prix)

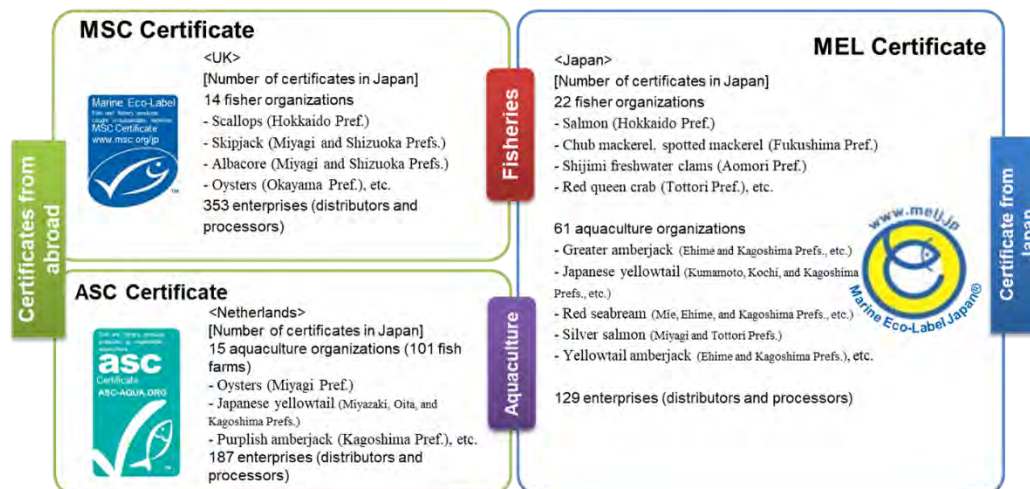


### (3) Approaches to Ensuring Information Provision to Consumers and to Protecting Intellectual Property



- There are various marine eco-labels around the world that certifies resource management and environmental efforts. In Japan, MSC, ASC, and MEL are mainly used, and their use has been promoted.
- Other systems of providing information to consumers and protecting intellectual property include the obligation to label the place of origin under the Food Labeling Act, the system for food with function claims, and the geographical indication (GI) protection system.

#### Main Marine Eco-Label Certificates Used in Japan



“Miyagi Salmon” whose GI was registered in Vietnam in 2022

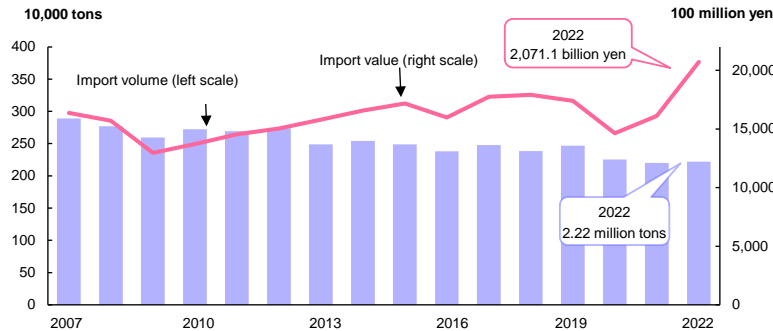
\* The number of certificates is that as of March 31, 2023 (according to the Fisheries Agency).

## (4) Trends in the Trade of Fish and Fishery Products

### i. Trends in Importation of Fish and Fishery Products

- The import volume of fish and fishery products (on a product weight basis) increased by 0.9% from the previous year to 2.22 million tons in 2022. The import value increased by 28.6% from the previous year to 2,071.1 billion yen.
- Major import items in terms of import value are salmon and trout, skipjack and tuna, and shrimp, etc.

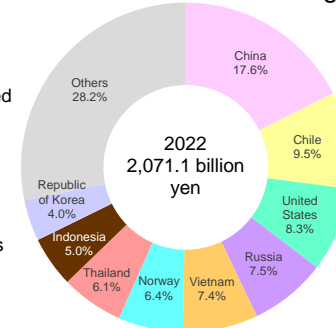
#### Trends in the Import Volume and Import Value of Fish and Fishery Products, Import Source Countries/Regions, and Breakdowns of Items



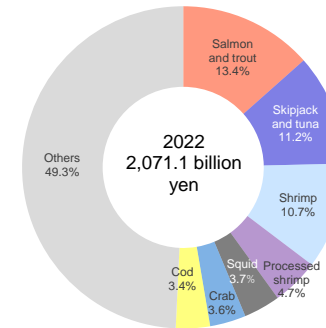
Source: Prepared by the Fisheries Agency, based on the Foreign Trade Statistics (the Ministry of Finance)

Note: Since the figures less than the unit used are rounded off, the total in each of the breakdowns does not necessarily amount to 100%.

#### <Import source countries and regions>



#### <Import items>

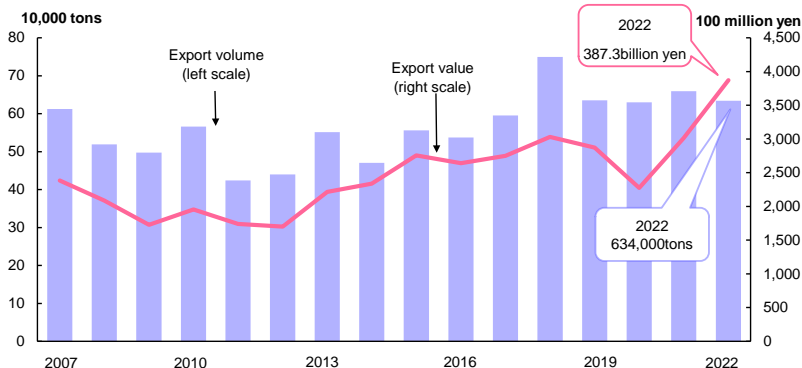


Share in the total import value of agricultural, forestry, and fishery products and food: 15.4%

### ii. Trends in Export of Fish and Fishery Products

- The export volume of fish and fishery products (on a product weight basis) decreased by 3.8% from the previous year to 0.634 million tons in 2022. The export value increased by 28.5% from the previous year to 387.3 billion yen.
- Major export destinations are China, Hong Kong, and the United States, accounting for over 50% or more of the total export value.
- Major export items are scallop, yellowtail, etc., in terms of export value.
- A target for export of agricultural, forestry, and fishery products and foodstuffs to reach 5 trillion yen (including fishery products of 1.2 trillion yen) by 2030 was established in March 2020. Priority items of fish and fishery products are yellowtail, sea bream, scallops, pearls, and colored carp.

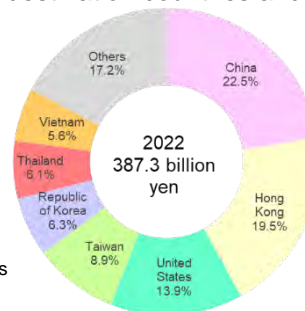
#### Trends in the Export Volume and Export Value of Fish and Fishery Products, Export Destination Countries/Regions, and Breakdowns of Items



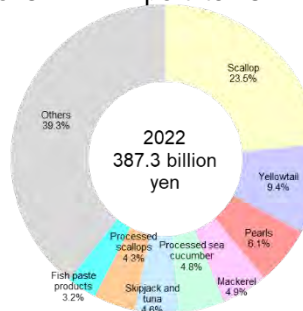
Source: Prepared by the Fisheries Agency, based on the Foreign Trade Statistics (the Ministry of Finance)

Note: Since the figures less than the unit used are rounded off, the total in each of the breakdowns does not necessarily amount to 100%.

#### <Export destination countries and regions>



#### <Export items>



Share in the total export value of agricultural, forestry, and fishery products and food: 27.4%

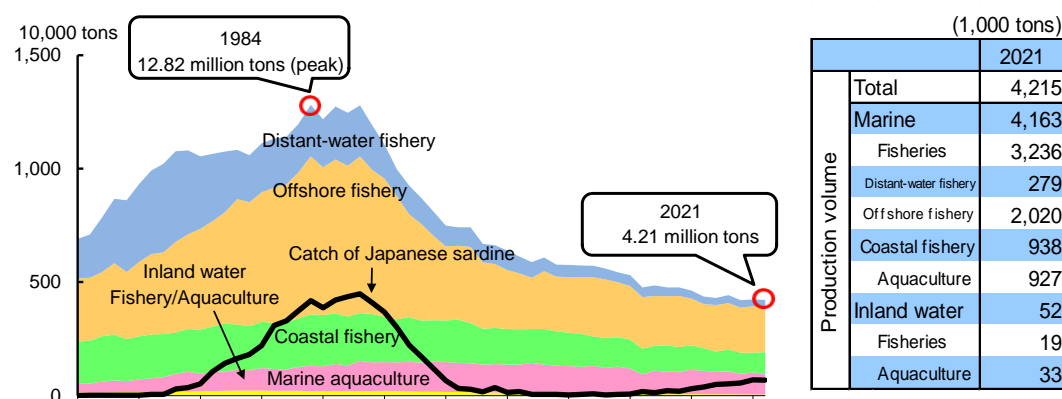


## Chapter 2 Trends in Japan's Fisheries

### (1) Trends in Domestic Fisheries and Aquaculture Production

- The volume of domestic fisheries and aquaculture production decreased by 20,000 tons from the previous year to 4.21 million tons in 2021, of which that of marine fisheries increased by 20,000 tons from the previous year to 3.24 million tons. In particular, the volume of mackerel, skipjack, etc., increased. The volume of marine aquaculture decreased by 40,000 tons to 0.93 million tons. The volume of inland water fisheries and aquaculture increased by 1,000 tons to 50,000 tons.
- The production value of domestic fisheries and aquaculture increased by 60.2 billion yen from the previous year to 1,399.9 billion yen in 2021, of which that of marine fisheries increased by 34.6 billion yen to 806.7 billion yen, that of marine aquaculture increased by 14.4 billion yen to 469.3 billion yen, and that of inland water fisheries and aquaculture increased by 11.2 billion yen to 124.0 billion yen.

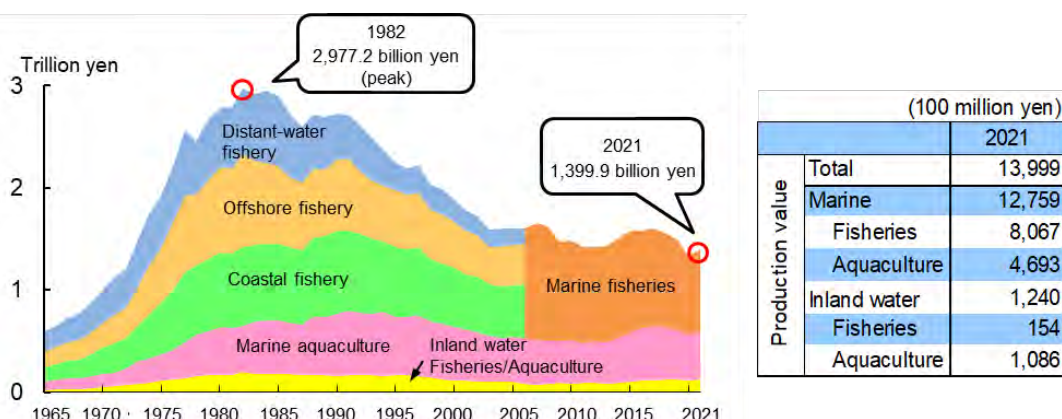
#### Trends in the Production Volume of Fisheries and Aquaculture



Source: Fisheries and Aquaculture Production Statistics (the Ministry of Agriculture, Forestry and Fisheries)

Note: For the production volumes of "distant-water fishery," "offshore fishery," and "coastal fishery," which are breakdown items of the production volume of fisheries and aquaculture, surveys of the catches of fishing vessels by tonnage group were discontinued in 2007. Therefore, the figures for 2007 to 2010 are estimates. For surveys in 2011 and beyond, the catch of each type of fisheries that belongs to "distant water fishery," "offshore fishery," and "coastal fishery" are added up.

#### Trends in the Production Value of Fisheries and Aquaculture



Source: Prepared by the Fisheries Agency, based on the Gross Fisheries Output (the Ministry of Agriculture, Forestry and Fisheries)

Notes: 1) The fishery production value was obtained by adding the juveniles production value to the fishery output (a value estimated by multiplying the production volume of fisheries and aquaculture by the wholesale prices in the landing area, etc.).

2) Compilation of the production value by sector of marine fisheries was discontinued in 2007.

### (2) Trends in Management of Fisheries and Aquaculture

#### i. Trends in Management of Fisheries by Fishing Vessels/Aquaculture

- The average fishing income of private management bodies engaged in coastal fisheries using vessels increased by 20,000 yen from the previous year to 1.14 million yen in 2021. The business income including non-fishing income in the same year was 1.34 million yen. The average fishing income of private management bodies engaged in fisheries using fishing vessels of 10 tons or more was 2.69 million yen in the same year, and the business income of the same was 3.02 million yen.
- Corporate management bodies engaged in fishing vessel fisheries have been experiencing deficits in average fishery income. Operating losses, including non-fishery losses, posted were 11.58 million yen in FY2021.
- The average fishing income of private management bodies engaged in marine aquaculture decreased by 0.31 million yen from the previous year to 4.96 million yen in 2021.
- The production value of fisheries and aquaculture per fisher in Japan was 10.83 million yen, and the fishery income produced was 5.32 million yen.



## Trends in Management of Private Management Bodies

| (Unit: 1,000 yen)                        |                                      |               |   |                |                      |                |
|--|--------------------------------------|---------------|---|----------------|----------------------|----------------|
|  | <Coastal fishery by fishing vessels> |               | <Fishery by fishing vessels of 10 tons or more> |                | <Marine aquaculture> |                |
|  | 2020                                 | 2021          | 2020  | 2021           | 2020                 | 2021           |
| Business income                          | 1,347                                | 1,338         | 3,701   | 3,023          | 5,473                | 5,156          |
| Fishing income                           | 1,124                                | 1,141         | 3,300   | 2,886          | 5,269                | 4,960          |
| Fishing revenue                          | 5,121                                | 5,412         | 32,445  | 30,818         | 30,891               | 31,765         |
| Fishing expenditure                      | 3,997 (100.0)                        | 4,271 (100.0) | 29,145 (100.0)                                  | 28,133 (100.0) | 25,622 (100.0)       | 26,806 (100.0) |
| Employee wages                           | 499 (12.5)                           | 531 (12.4)    | 7,301 (25.1)                                    | 7,307 (26.0)   | 3,741 (14.6)         | 3,880 (14.4)   |
| Fishing vessel and fishing gear expenses | 345 (8.6)                            | 339 (7.9)     | 2,251 (7.7)                                     | 1,813 (6.4)    | 1,055 (4.1)          | 1,276 (4.8)    |
| Repair costs                             | 355 (8.9)                            | 397 (9.3)     | 2,236 (7.7)                                     | 2,049 (7.3)    | 1,620 (6.3)          | 1,661 (6.2)    |
| Oil costs                                | 575 (14.4)                           | 668 (15.6)    | 4,479 (15.4)                                    | 4,764 (16.9)   | 1,253 (4.9)          | 1,472 (5.5)    |
| Fixed costs                              |                                      |               |   |                | 5,448 (21.3)         | 4,863 (18.1)   |
| Juveniles costs                          |                                      |               |   |                | 1,237 (4.8)          | 1,027 (3.8)    |
| Selling charges                          | 365 (9.1)                            | 375 (8.8)     | 1,977 (6.8)                                     | 1,796 (6.4)    | 1,079 (4.2)          | 1,357 (5.1)    |
| Depreciation                             | 645 (16.1)                           | 678 (15.9)    | 2,517 (8.6)                                     | 2,713 (9.6)    | 3,395 (13.3)         | 3,645 (13.6)   |
| Others                                   | 1,213 (30.3)                         | 1,282 (30.0)  | 8,385 (28.8)                                    | 7,691 (27.3)   | 6,795 (26.5)         | 7,643 (28.5)   |
| Non-fishing income                       | 223                                  | 196           | 400   | 337            | 204                  | 196            |

Source: Statistical Survey on Fishery Management and Census of Fisheries (the Ministry of Agriculture, Forestry and Fisheries)

Notes: 1) Each of the figures in parentheses indicates a percentage to fishing expenditure (%) and is rounded off if it is less than the unit used. For that reason, the total of these figures may not match the total in the breakdown.

2) The figures for coastal fishery by fishing vessels are weighted-averaged using the number of private management bodies using fishing vessels with outboard motors or powered fishing vessels of less than 10 tons in the "Census of Fisheries," based on the results of fishery by fishing vessels in the survey on private management bodies under the "Statistical Survey on Fishery Management."

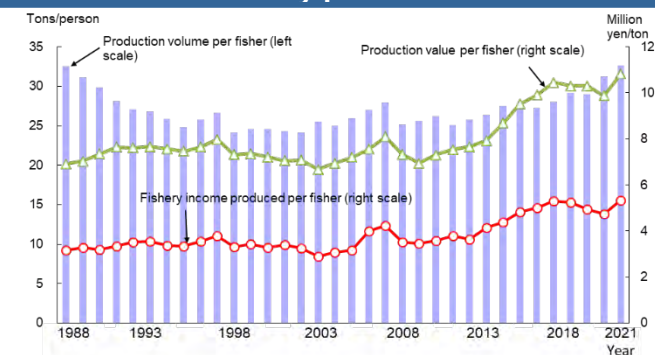
3) The figures for fishery by fishing vessels of 10 tons or more are weighted-averaged using the number of private management bodies using powered fishing vessels of 10 tons or more in the "Census of Fisheries," based on the results of fishery by fishing vessels in the survey on private management bodies under the "Fishery Management Survey."

4) The figures for marine aquaculture are weighted-averaged using the number of private management bodies by fisheries species in the "Census of Fisheries," based on the results of the survey on private management bodies under the "Statistical Survey on Fishery Management."

5) The figures for fishery by fishing vessels in 2020 are the results excluding those concerning management bodies in Fukushima Prefecture, as they were unable to carry out fisheries due to the Great East Japan Earthquake.

6) Fishing revenue does not include amounts received from subsidies.

## Productivity per Fisher



Source: Prepared by the Fisheries Agency, based on the Census of Fisheries (number of fishery workers for 1988, 1993, 1998, 2003, 2008, 2013, and 2018), the Survey on Movement of Fishery Structure (number of fishery workers in 2019 and beyond), the Survey of Persons Engaged in Fishery (number of fishery workers for other years), the Statistics on Fishery and Aquaculture Production (production volume), and the Fisheries Output (production value and fishery income produced) (the Ministry of Agriculture, Forestry and Fisheries)

Note: The figures for 2011 and 2012 exclude Iwate, Miyagi, and Fukushima prefectures (the production value of inland water fisheries and aquaculture was estimated from the nationwide average price by fisheries species).

## ii. "Seashore Revitalization Plan" to Boost Incomes

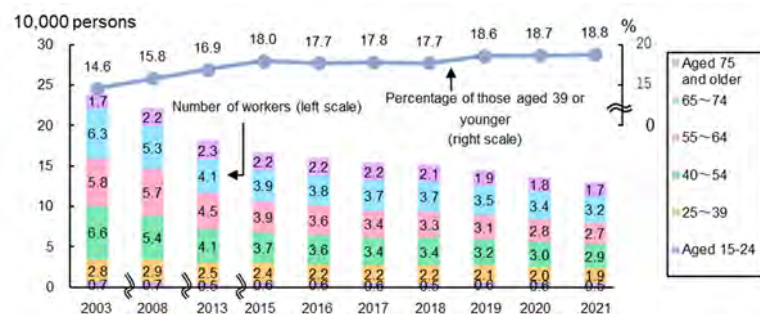
- Under the "Seashore Revitalization Plan," each district considers and implements measures aimed at revitalizing fishing communities by increasing the income of fishers by at least 10% in five years. As of the end of FY2022, it is implemented in 554 districts.
- As of the end of FY2022, the "Wide-Area Seashore Revitalization Plan," in which efforts are made to enhance wide-ranging competitiveness, is implemented in 142 districts.
- On the basis of the Wide-Area Seashore Revitalization Plan, etc., support has been given to, among other matters, the lease-based introduction of fishing vessels, the restructuring of facilities in landing areas, the introduction of fishing devices, etc., which can enhance productivity or realize labor-saving or energy-saving, and the development of fishing port facilities.

## (3) Trends in Fishery workers

- The number of fishery workers has been consistently declining, reaching 129,320 in 2021.
- The number of new fishery workers was 1,744 in FY2021. The government, etc. provides support for initiatives that seek to secure new fishery workers, such as employment counseling, internship, and training.



## Trends in the Number of Fishery Workers

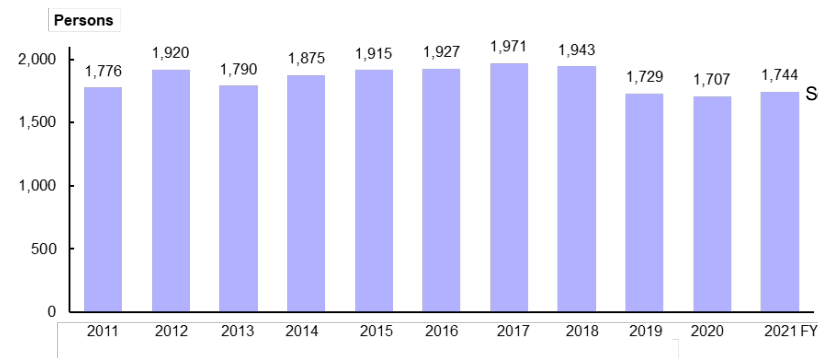


Source: Survey on Movement of Fishery Structure (2019 and beyond), Census of Fisheries (2003, 2008, 2013, and 2018), and Survey of Persons Engaged in Fishery (other years) (the Ministry of Agriculture, Forestry and Fisheries)

Notes: 1) A "fishery worker" refers to a person aged 15 or older who has been engaged in offshore fishery operations for at least 30 days in the past year.

2) For 2008 and beyond, the surveys were conducted on the fishery management body (employer) side and included those residing in non-coastal municipalities who had not been previously included. Therefore, those surveys are not in line with the 2003 survey.

## Trends in the Number of New Fishery Workers

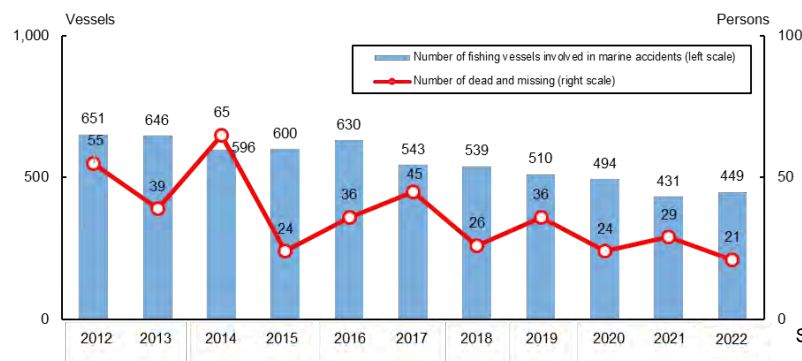


Source: Estimated by the Fisheries Agency, based on surveys conducted by prefectures on new fishery workers

## (4) Trends in Fishery Working Environments

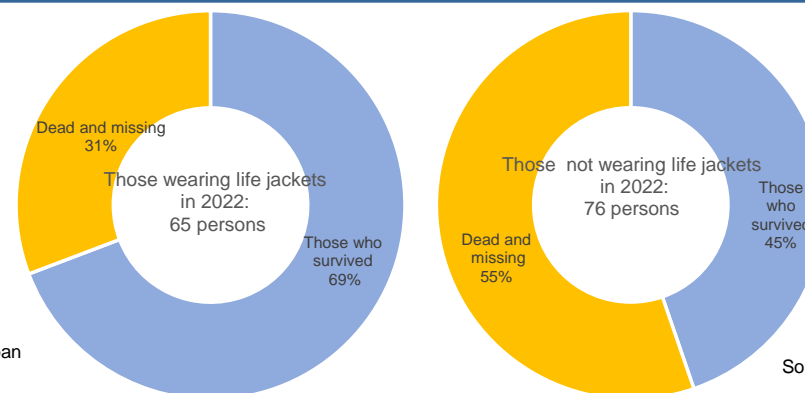
- In 2022, the number of fishing vessels involved in marine accidents was 449, and the number of dead and missing reported in those accidents was 21.
- Excluding those related to marine accidents, 65 fishers fell overboard in 2022,\* 43 of whom were dead or missing. (\*: The number of fishers who fell overboard herein refers to the number of persons on board vessels who fell into the sea for reasons other than marine accidents such as collision and capsizing.)
- Life jackets are vital to saving the lives of those who fall overboard (an approximately 1.5 times better survival rate). In principle, all persons on board outside the cabin are required to wear life jackets. Starting in February 2022, violation points are given to captains violation points for violating the requirement of wearing life jackets.

## Trends in the Number of Fishing Vessel Involved in Marine Accidents and the Number of Dead and Missing Associated with Marine Accidents



Source: Prepared by the Japan Coast Guard

## Survival Rates of Those Who Fell Overboard With or Without Life Jackets

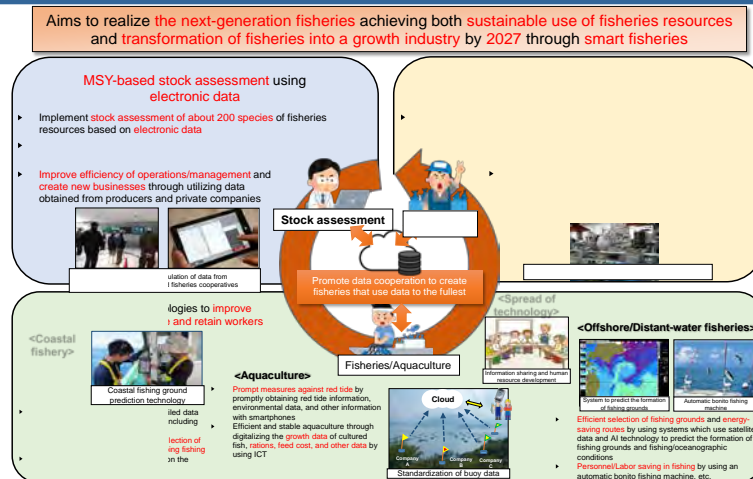


Source: Prepared by the Japan Coast Guard

## (5) Development and Utilization of Technologies for Promoting Smart Fisheries

- Development, introduction, and advancement of technologies related to efficiency-related initiatives utilizing ICT, IoT, AI, and drones in each of the stock assessment, fisheries/aquaculture, and processing/distribution sectors are promoted in order for the fisheries industry to be a growing industry.
- The “Guidelines for Data Utilization in the Fisheries Sector” was formulated to promote the utilization of data.

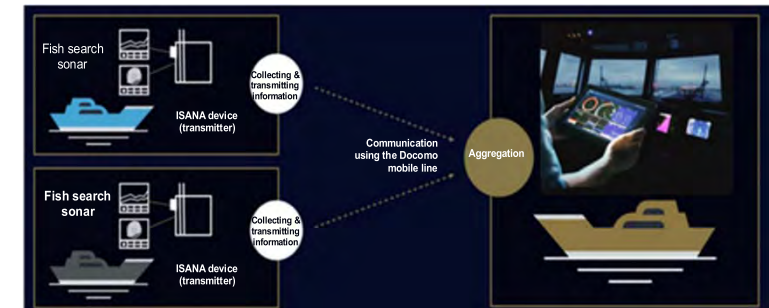
### Vision of Smart Fisheries in 2027



### Case Example Visualization of Information by Utilizing IoT—Streamlining of Fleet Operations Such as Purse Seine Fishery—

“ISANA,” an IoT service for fishing vessels, enables data from fish detectors, tidal current meters, shipboard cameras, etc., to be shared and recorded real time on tablets, replacing the conventional, wireless or oral manner of information sharing.

The adoption of the service is expected to help develop successors by enabling an onshore veteran fisher to give instructions to an offshore chief fisher, in addition to the use of the service in streamlining operations through, for example, reduction of fuel oil costs and operating hours.



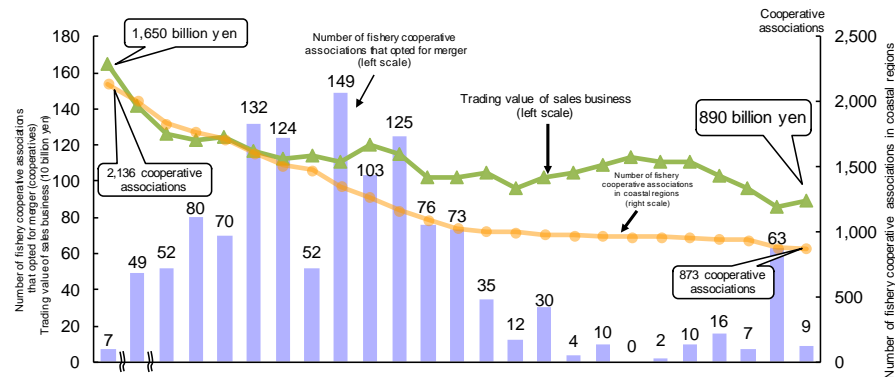
Service Conceptual Diagram (Image Provided by Lighthouse Inc.)

## (6) Trends in Fishery Cooperative Associations

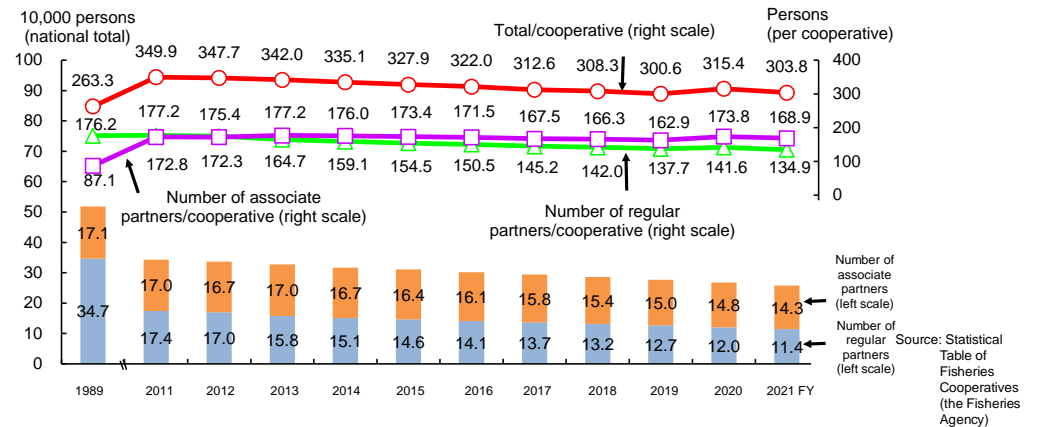
- A fishery cooperative association contributes to stabilization and development of fishery business management by implementing sales business, etc. It is an organization that plays a core role in supporting the regional economy and social activities of a fishing community, such as by using and managing fisheries resources appropriately.
- The number of fishery cooperative associations (in coastal areas) as of the end of March 2022 was 873.
- The number of fishery cooperative association partners has been decreasing in line with a decline in the number of fishers. There is a need to strengthen cooperatives' business and management foundation through mergers and to further reinforce their sales business.



Trends in the Number of Fishery Cooperative Associations in Coastal Areas, the Number of Fishery Cooperative Associations That Opted for Mergers, and the Trading Value of Sales Business



Trends in the Number of Fishery Cooperative Associations Partners

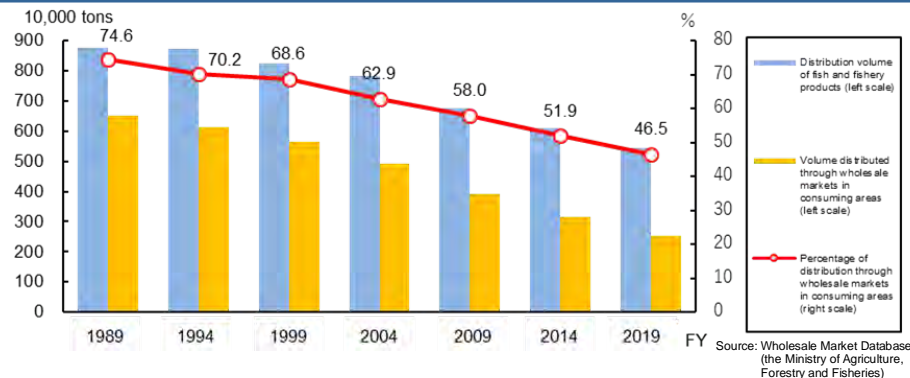


## (7) Trends in the Distribution and Processing of Fish and Fishery Products

### i. Trends in the Distribution of Fish and Fishery Products

- The number of wholesale fishery markets in landing areas had been flat in recent years, and that of wholesale markets in consuming areas decreased.
- The percentage of fish and fishery product distribution through wholesale markets in consuming areas has been on a decreasing trend, and non-market distribution has been increasing.
- Wholesale markets play a critical role in effectively distributing fish and fishery products. It is necessary to strengthen quality and sanitary control systems in anticipation of export and to maintain/strengthen market functions.

Trends in the Volume and Percentage of Fish and Fishery Product Distribution Through Wholesale Markets in Consuming Areas



Trends in the Number of Wholesale Fishery Markets



Source: Wholesale Market Database (the Ministry of Agriculture, Forestry and Fisheries)

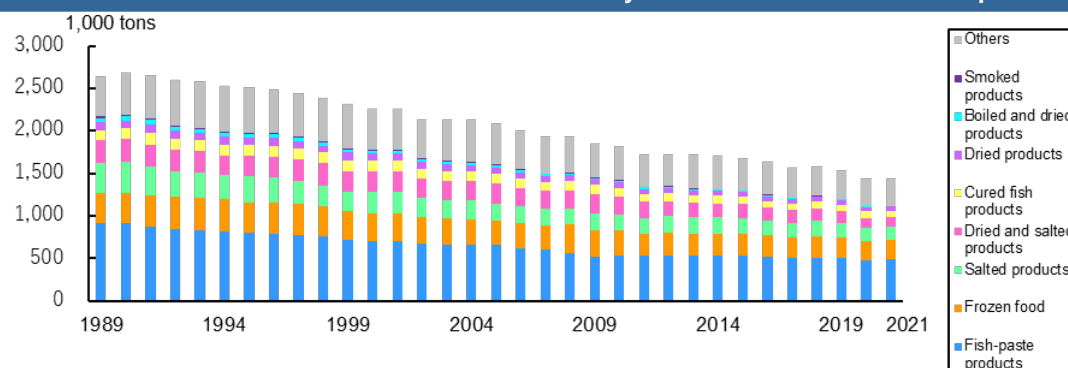
Notes: 1) Data for central wholesale markets are the data at the end of every fiscal year, whereas data for local wholesale markets are the data at the beginning of each fiscal year (up to FY2011) and at the end of each fiscal year (FY2012 and later).

2) The Amended Wholesale Market Act has been in force since June 21, 2020. Accordingly, for data up to FY2019, a central wholesale market refers to a wholesale market which a prefecture or a city, etc., with a population of 200,000 people or more opened upon the authorization of the Minister of Agriculture, Forestry and Fisheries. A local wholesale market refers to a wholesale market which is other than central wholesale markets, has a wholesale area of at least a certain size (330 m<sup>2</sup> for a market in a landing area or 200 m<sup>2</sup> for a market in a consuming area), and was opened upon the permission of a prefectural governor. For data from FY2020 onward, a central wholesale market refers to a wholesale market authorized by the Minister of Agriculture, Forestry and Fisheries. A local wholesale market refers to a wholesale market authorized by a prefectural governor.

### ii. Trends in Fishery Processing

- 70% of the total supply of fish and shellfish for domestic human consumption in Japan is supplied as processed fishery products.
- Among processed fishery products, the production volume of processed products for human consumption has been on a decreasing trend, but the production volume of fish paste products and frozen food has been flat.
- It is necessary to develop products that meet diversifying consumer needs and build a production system that enables the switching of raw materials in the midst of a shortage of raw materials for processing.

Trends in the Production Volume of Processed Fishery Products for Human Consumption



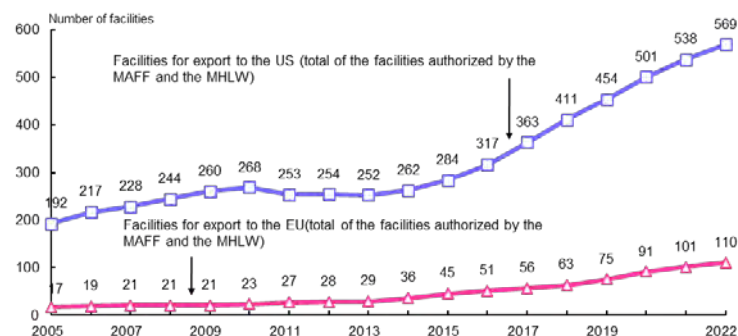
Source: Annual Report on Fish and Fishery Product Distribution Statistics (2009 and before), Census of Fisheries (2013 and 2018), and Fishery Processing Statistics Survey (other years) (the Ministry of Agriculture, Forestry and Fisheries)

Note: Processed fishery products refer to processed products for human consumption and fresh/frozen fish and fishery products which are produced with aquatic animals and plants used as their main raw materials (a raw material ratio of at least 50%). Toasted/Flavored seaweed, canned or bottled products, agar, and oils and fats are excluded.

### iii. HACCP Compliance

- Intended for, in principle, all food business operators including fishery processors, the implementation of HACCP-based hygiene control has been institutionalized.
- When exporting fish and fishery products to the EU, the United States, etc., fishery processing facilities need to implement the HACCP (Hazard Analysis Critical Control Point) system and to conform to related facilities criteria, as required by the export destination countries and regions. The government supports the renovation of facilities to obtain the facility certification required for export to the EU and the United States.
- As of the end of March 2023, in the fishery processing industry, etc., the number of facilities certified to export to the EU is 110, and the number of facilities certified to export to the United States is 569.

Trends in the Number of Facilities Certified to Export to the EU/US in the Fishery Processing Industry, etc.



Source: Prepared by the Ministry of Agriculture, Forestry and Fisheries

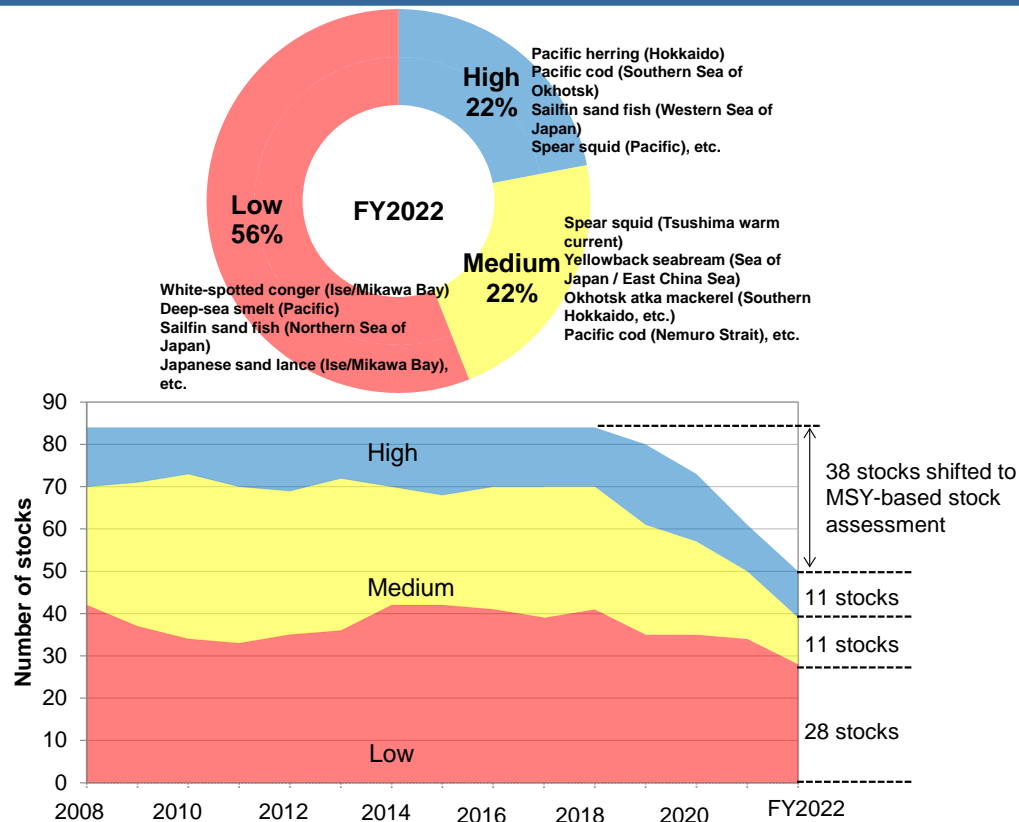
# Chapter 3 Trends in Fisheries Resources and the Fishing Ground Environment

## (1) Fisheries Resources in the Waters Around Japan



- To manage fisheries resources, it is important to take appropriate management measures based on stock assessment.
- Under the new Fishery Act enforced in December 2020, the number of fisheries species subject to stock assessment was expanded from 119 to 192 in FY2021.
- Among these species, the number of those fisheries species subject to the estimation of abundance and fishing intensity for the purpose of achieving the MSY (Maximum Sustainable Yield) was expanded from 26 stocks of 17 fisheries species to 38 stocks of 22 fisheries species.
- For 50 stocks of 36 fisheries species, stock assessments were made with three levels of stock condition: high, medium, and low.

### Stock Assessment With Three Levels of Condition: High, Medium, and Low



Source: Prepared by the Fisheries Agency, based on the Marine Fisheries Assessment and Evaluation for Japanese Water (the Fisheries Agency and Japan Fisheries Research and Education Agency)

Note: The stocks and fisheries species whose stock levels and trends were assessed were as follows.

2019: 80 stocks of 48 fisheries species excluding the 7 stocks of 4 fisheries species which were shifted to MSY-based stock assessment, such as mackerel

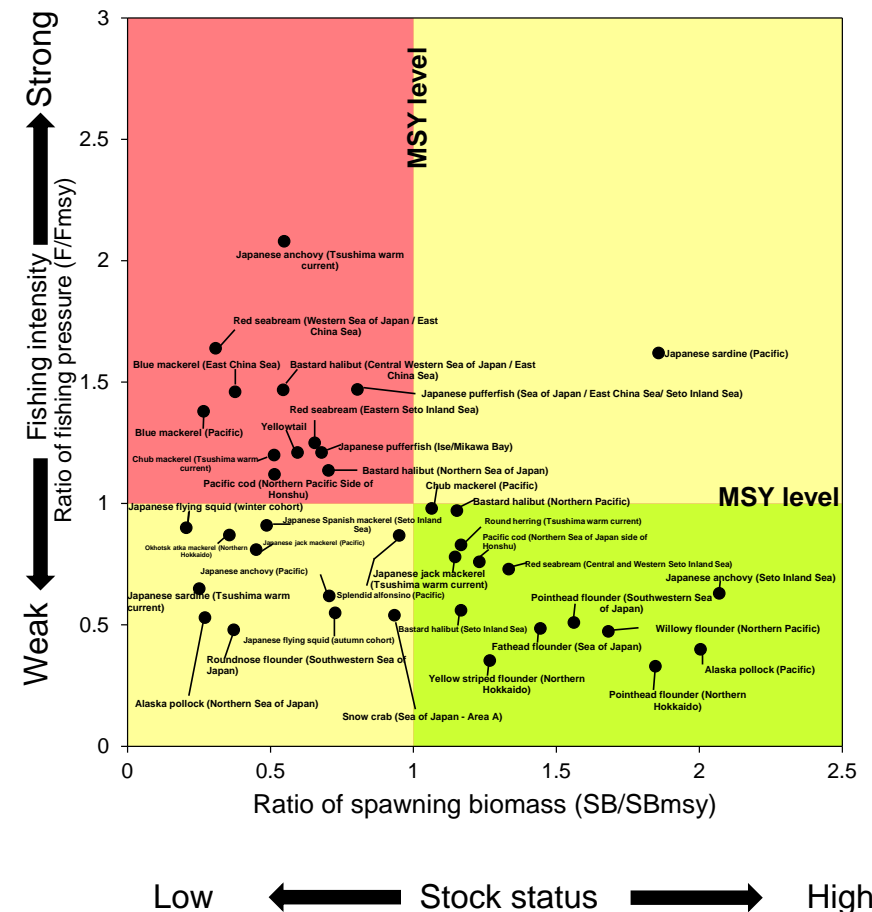
2020: 73 stocks of 45 fisheries species excluding the 14 stocks of 8 fisheries species which were shifted to MSY-based stock assessment, such as Japanese jack mackerel and Japanese sardine

2021: 61 stocks of 42 fisheries species excluding the 26 stocks of 17 fisheries species which were shifted to MSY-based stock assessment, such as Japanese anchovy and round herring

2022: 50 stocks of 36 fisheries species excluding the 38 stocks of 22 fisheries species which were shifted to MSY-based stock assessment, such as Japanese pufferfish and splendid alfonsino

From 2020 onward, for 6 stocks of 2 fisheries species such as Alaska pollock (Southern Sea of Okhotsk), the three levels of condition "high, medium, and low" are judged on the basis of the stock status index, etc., stated in the stock assessment result report.

### Stock Assessment Based on MSY



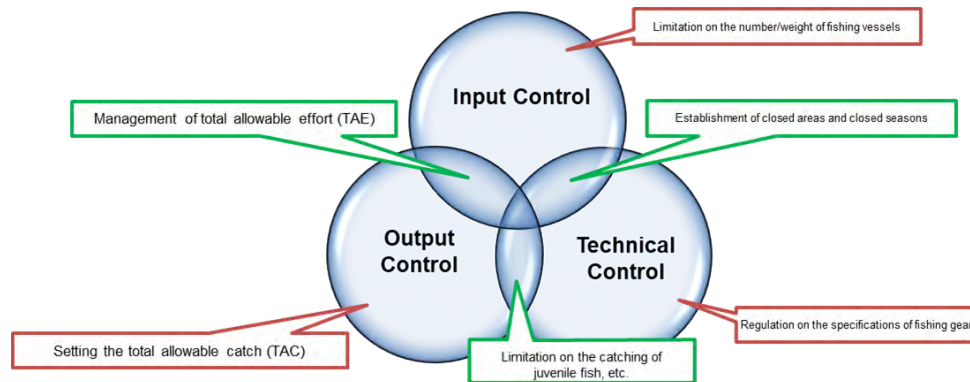
Source: Prepared by the Fisheries Agency, based on the Marine Fisheries Assessment and Evaluation for Japanese Water (the Fisheries Agency and Japan Fisheries Research and Education Agency)

## (2) Japan's Fisheries Resource Management

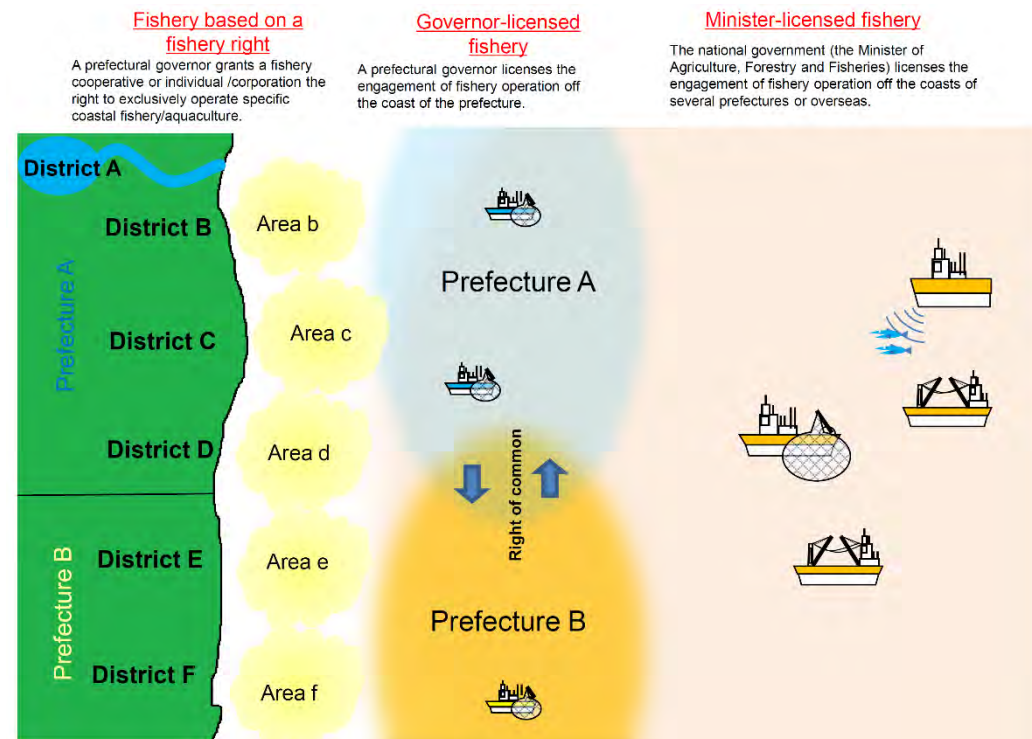
### i. Japan's Fisheries Resource Management System

- Methods for resource management are primarily classified into 1) input control, 2) technical control, and 3) output control. These methods are appropriately used and combined in Japan to properly manage resources, taking into account the characteristics of fisheries, the number of fishers, the status of stocks, etc.
- Shellfish and algae harvesting, set-net fishing, aquaculture, and inland water fisheries are managed under a fishery rights systems. Offshore and distant fisheries are managed on the basis of fishing permit systems.

#### Correlation Between Resource Management Methods



#### Conceptual Diagram of the Fishery Rights System and Fishing Permit Systems

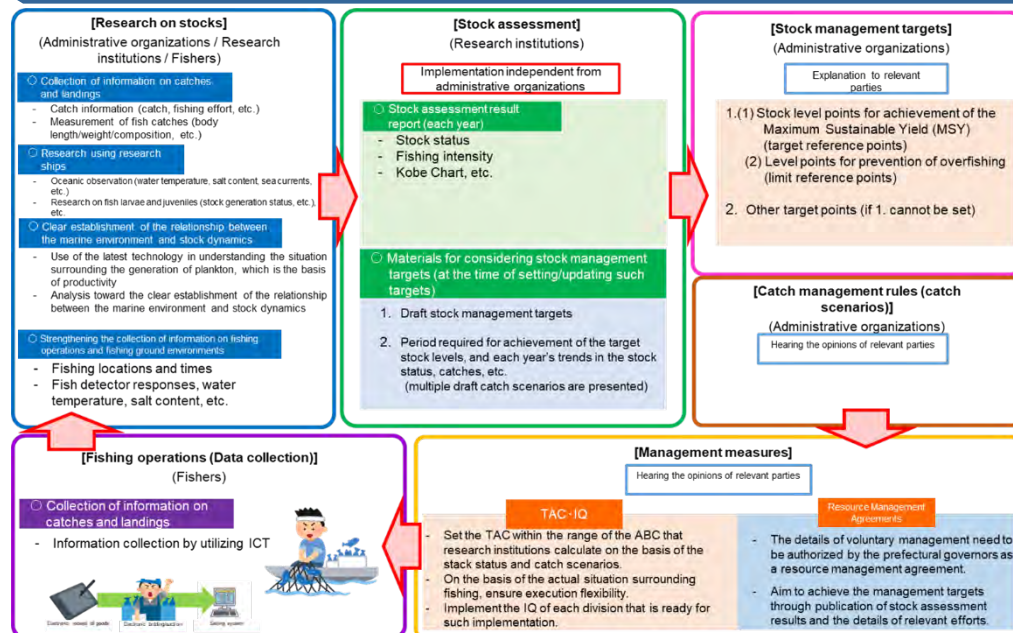




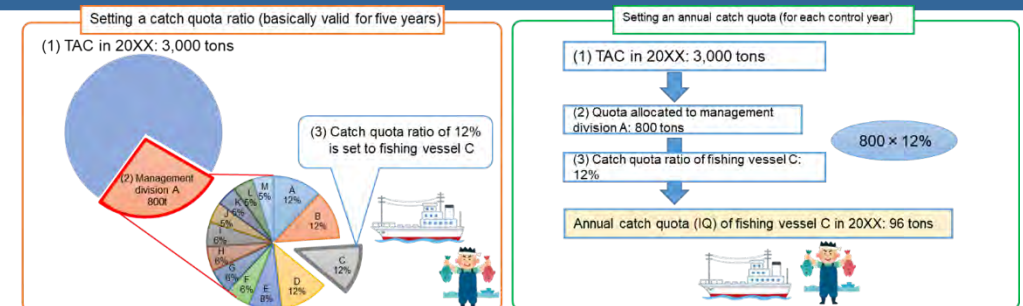
## ii. Promotion of the New Resource Management Based on the New Fishery Act

- Under the new Fishery Act, the objectives of resource management are to set the fisheries catches based on the MSY, and TAC (Total Allowable Catch) are used as a basic management method.
- To establish a new resource management system, the “Roadmap for Promoting the New Resource Management” was developed and published in September 2020.
- The roadmap aims to recover catch to 4.44 million tons by FY2030 through the following measures: by the end of FY2023, 1) expanding the fisheries species subject to stock assessment to about 200 species; 2) putting 80% of catch under TAC management; 3) introducing management based on IQs (individual quotas) to Minister-licensed fisheries, which mainly targets, in principle, TAC species; and 4) shifting the current voluntary resource management by fishers (Resource Management Plans) to “Resource Management Agreements” based on the new Fishery Act.
- With regard to the expansion of TAC species, TAC management as well as the concept of step-up will be introduced to Japanese anchovy and round herring (Tsushima warm current) from January 2024. Ideas for the operational aspect of such management will continue to be discussed, including during the step-up period. With respect to pacific cod (Northern Sea of Japan side of Honshu and Northern Pacific Side of Honshu), the first study session on the resource management policy was held. Additionally, for other new candidate resources for TAC management, meetings of the Study Group on Resource Management Methods, etc., have been held to discuss the gradual expansion of TAC species.
- IQs have been introduced into, in addition to two types of fisheries and three fisheries species in the 2021 management year, the medium- to large-scale purse seine fishery of Japanese sardine and bluefin tuna (large fish) and also into bonito/tuna fishery in relation to bluefin tuna (large fish) since the 2022 management year. It has been decided that IQs are to be introduced, from the 2023 management year, into the driftnet fishery of marlin, etc., in relation to bluefin tuna (small fish and large fish), and into the minister-licensed squid jigging fishery of Japanese flying squid.
- With respect to Resource Management Agreements, eight agreements have been formulated as of March 2023. The plans for coastal fishery have also been gradually shifted to Resource Management Agreements certificated by prefectural governors.

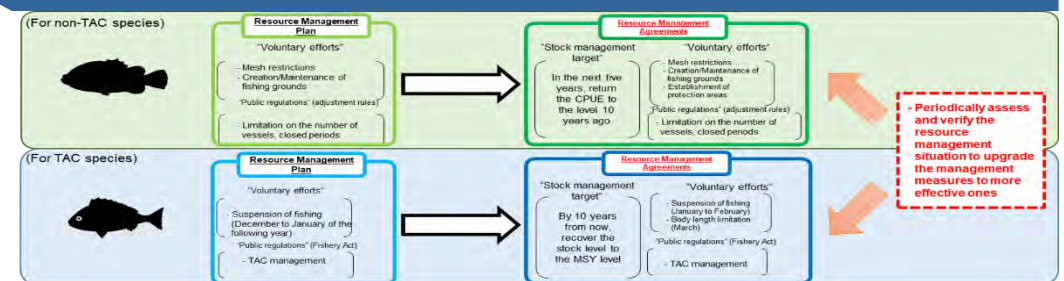
## Flow of Resource Management



## Image of Introducing IQ Management



## Image of Shift to Resource Management Plans to Resource



\* Catch Per Unit Effort: the amount of fish caught according to each unit of efforts

### iii. Pacific Bluefin Tuna Resource Management

- For Pacific bluefin tuna, with agreement of the Western and Central Pacific Fisheries Commission (WCPFC), the catch limit was set for large fish (30 kg or more) and small fish (less than 30 kg), and the TAC was distributed among divisions controlled by the Minister and prefectures.
- For the 2022 fishing season onward, the distributed shares were reviewed in light of, among other matters, an increase in the catch limit determined in the 2021 annual meeting of the WCPFC.
- Regarding recreational fishing, since June 1, 2021, catching of small fish is prohibited, and it is mandatory to report the number and weight of fish caught in the case of large fish.

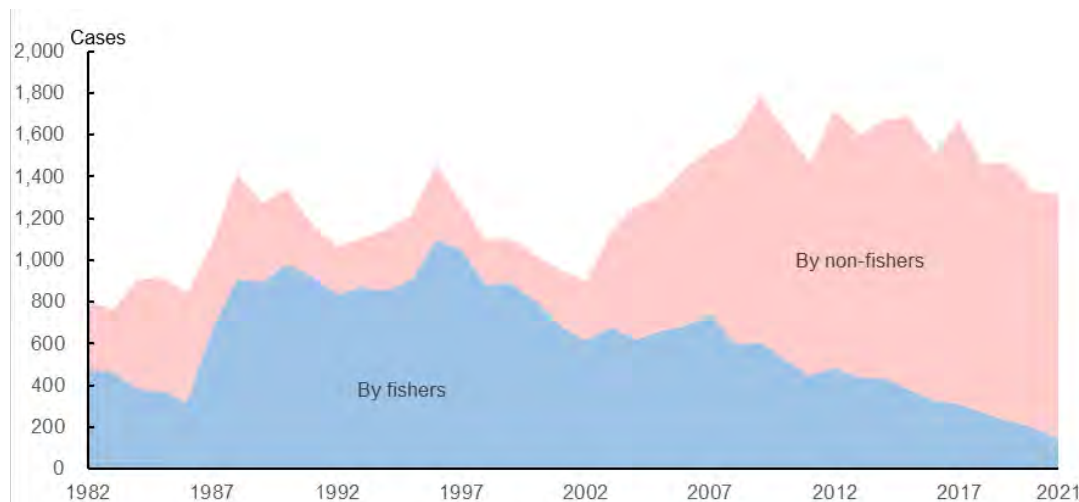
## (3) Approaches to Practical and Effective Resource Management



### i. Prevention of Poaching and Fishery Control in Coastal Areas of Japan

- The nationwide number of arrests for poaching was 1,361 in 2021 (of which 1,316 were in coastal waters and 45 in inland waters). The number of poaching cases by non-fishers has significantly exceeded the number by fishers and have become more aggressive and sophisticated.
- Based on the new Fishery Act, abalones, sea cucumbers, and juvenile eels,\* which have been the subject matters of malicious poaching, have been designated as “specified aquatic animals and plants,” and catching of them is, in principle, prohibited except for catching based on a fishery right or permission. A person who violates the prohibition is punished by imprisonment with work for not more than three years or a fine of not more than 30 million yen. The same penal provision applies also to a person who transports, retains, or acquires any specified aquatic animals or plants knowing that they have been illegally gathered or caught. (\*: The Act will apply to juvenile eels from December 2023.)

Trends in the Number of Arrests for Violation of Fisheries Laws and Regulations in Japan's Marine Regions



Source: Prepared by the Fisheries Agency

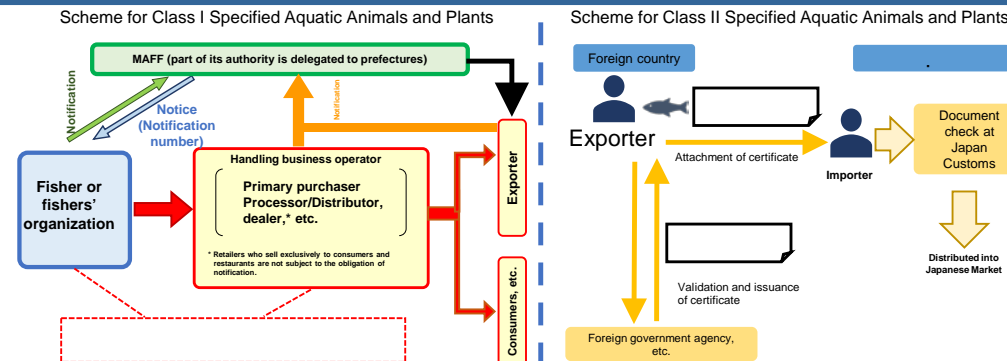
Outline of Harsher Punishment Based on the New Fishery Act

|                      | Violation of prohibition on gathering or catching<br>Acceptance of poached products            | Fishing without a license  | Infringement of a fishery right              |
|----------------------|--|--|--|
| Before the amendment |  | Imprisonment with work for not more than three years<br>A fine of not more than two million yen        | A fine of not more than 200,000 yen          |
| After the amendment  | Imprisonment with work for not more than three years<br>A fine of not more than 30 million yen | ↓<br>Imprisonment with work for not more than three years<br>A fine of not more than three million yen | ↓<br>A fine of not more than one million yen |

## ii. Introduction of the Scheme for Proper Distribution of Fishery Products against IUU Fishing

- The Act on Ensuring the Proper Domestic Distribution and Importation of Specified Aquatic Animals and Plants came into force in December 2022, with the aim of preventing the laundering, etc., of illegally gathered or caught specific aquatic animals and plants at home or abroad into distribution channels. Domestically, the Act requires handling fishers, etc., to complete such procedures as notification to the relevant administrative organizations and communication of the catch numbers. For importation from abroad, among other procedures, the attachment of certificates, etc., issued by foreign government agencies is mandatory.
- Abalones, sea cucumbers, and juvenile eels\* are designated as class I aquatic animals and plants, for which domestic distribution control is in place. Mackerel, saury, Japanese sardine, and squid are designated as class II aquatic animals and plants, for which import control is in place. (\*: This will apply to juvenile eels from December 2025. A juvenile eel refers to an eel that is 3 cm long or shorter.)

### Outline of the System for Proper Distribution of Fisheries Products

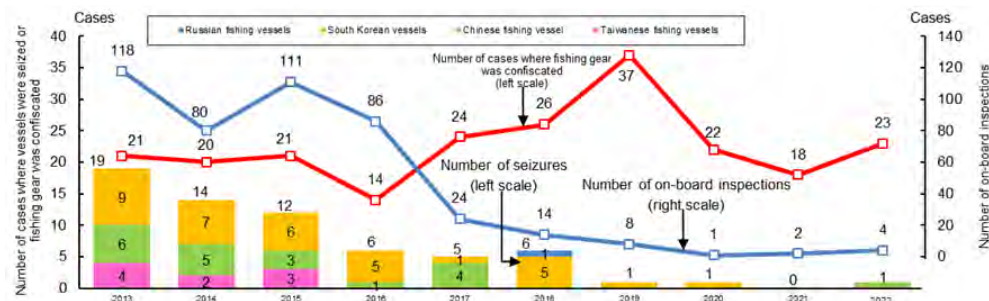


Note: There are penalties against violations of the obligations of notification, communication, recording of transactions, attachment of certificates for import/export, and others.

## iii. Monitoring and Inspection of Foreign Fishing Vessels, etc.

- In 2022, with respect to the results of the Fisheries Agency's inspections of foreign fishing vessels, etc., it conducted four on-board inspections, captured one vessel, and had 23 cases of confiscation of illegal fishing gear.
- Illegal fishing by Chinese and North Korean fishing vessels around the Yamato Bank of the Sea of Japan is an extremely serious problem. The Fisheries Agency concentrates on conducting enforcement activities by using fisheries inspection vessels and responds in cooperation with the Japan Coast Guard. In 2022, the Fisheries Agency issued a warning 38 Chinese fishing vessels, etc., to leave from Japanese EEZ in total.

### Trends in the Number of Foreign Fishing Vessels, etc., Captured and Inspected, etc.



Source: Prepared by the Fisheries Agency  
Note: On-board inspection on the high seas is not included.



Authorized fishery inspectors wearing protective gear are conducting an on-board inspection of a foreign vessel



## (4) Approaches to Actively Enhance Fisheries Resources

- The Fisheries Agency implements the release of juvenile fish as part of resource management, properly sharing roles with prefectures and prioritizing effective ones.
- Stocks of salmon (chum salmon) have declined in recent years due to a low return rate of released juvenile fish. It is also pointed out that changes in marine environments due to climate change also affect the survival of juvenile fish. The Fisheries Agency is therefore providing support for initiatives to improve release methods such that these methods can respond to environmental changes.
- In order to protect and increase fisheries resources, the Fisheries Agency develops protective and nursery reefs and mound reefs.

## (5) Trends in Fishing Ground Environments



### i. Promotion of Preservation and Recovery of Seaweed Beds and Tidal Flats, and Improvement of Fishing Ground Environments

- Seaweed beds play a vital role in conserving fisheries resources. Especially marine algae on many seaweed beds absorb carbon dioxide and thereby supply oxygen, and act as spawning beds of fishes. Tidal flats have a high productivity of marine organisms by provide nutrients from land to ocean due to effects of tidal movements.
- It is important to raise the productivity of the entire ecosystem by preserving and recovering functions of seaweed beds and tidal flats, therefore the Fisheries Agency promotes comprehensive measures conservation and creation of seaweed beds and tidal flats by local governments.
- The growth of marine algae and the multiplication of plankton that is food for fish, bivalves, etc., require nutrient salts including nitrogen and phosphorus compounds. It is suggested that, in enclosed water areas, a decline in nutrient salts, among other reasons, may potentially cause problems such as the decoloring of cultured nori seaweed.
- For the Seto Inland Sea, a nutrient salt management system to enable the supply and management of nutrient salts has been introduced following the enforcement of the amended Act on Special Measures Concerning Conservation of the Environment of the Seto Inland Sea in April 2022.
- To rejuvenate the Ariake Sea and Yatsushiro Sea, etc., measures are taken based on the Act on Special Measures Concerning Rejuvenation of Ariake Sea and Yatsushiro Sea, etc., to improve the marine environment and conserve fisheries resources in these regions.



Marine algae flourish after seaweed bed creation  
(black-colored part)



Preservation of seaweed beds  
(removal of sea urchins)



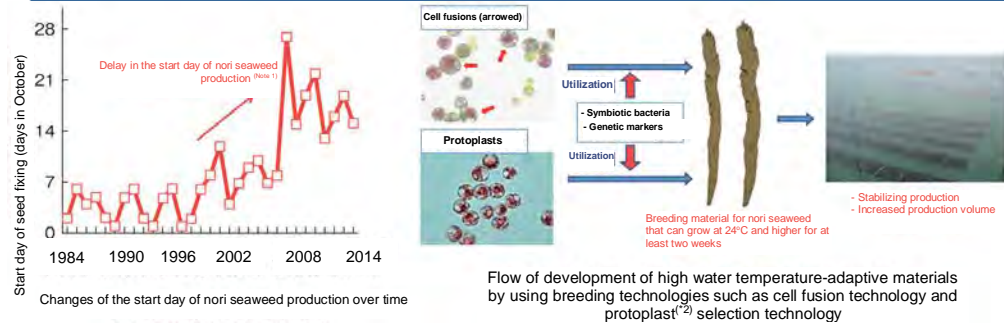
Maintenance of tidal flats  
(tilling of tidal flats)

### ii. Impact of Climate Change and Countermeasures

- Climate change affects fisheries resources and fisheries/aquaculture through rising sea water temperatures due to global warming. It has caused bountiful catches of Yellowtail in Hokkaido Prefecture, and a northward shift of the distribution area of Japanese Spanish mackerel and the spawning beds of chub mackerel.
- As mitigation measures against climate change, initiatives toward carbon neutrality are also promoted in the fisheries sector, including the electrification of fishing vessels, conversion to hydrogen fuel cells, and exploring the potential of blue carbon as a carbon sink.
- As an adaptive measure, the development of a method of releasing juvenile salmon that can adapt to changes in the marine environment and aquaculture species with tolerance to high temperature is promoted.



### Case Example of an Initiative Based on the Assessment of the Impact of High Water Temperature in Autumn on Nori Seaweed Cultivation, and on an Adaptation Plan



### Case Example Utilization of Reviewable Energy in the Fisheries Industry

Misaki Megumi Suisan Co., Ltd., a tuna wholesaler, utilizes electricity, etc., from Shizen Energy Inc., which engages in the generation of renewable energy, etc., for the operation of freezers among other purposes. Executing a partnership agreement with Shizen Energy, Misaki Megumi Suisan established “*Maguro Denki*” to support other business operators, etc., in their adoption of renewable energy.



\* Due to the surging price of wholesale electricity, the retail sale of electricity by *Maguro Denki* was discontinued at the end of November 2022.

Logo of Maguro Denki

### iii. Marine Plastic Litter

- Marine plastic litter affects not only the environment and ecosystems but also fishing operations, such as through intermixing with fish catches.
- There are several measures taken by the Fisheries Agency, such as 1) formulating guidelines to promote well-planned disposal of used fishing gear, 2) developing of fishing gears made with environmentally friendly materials such as marine biodegradable plastics and promoting their recycling, 3) promoting the bringing back of marine litter by fishers, and 4) verifying the impact of microplastics on marine organisms, etc.

### Prototype and demonstration of floats using marine biodegradable plastics (Photos provided by the Clean Sea and Beach Foundation)



### Case Example Recycling of Used Fishing Nets

It was regarded as difficult to recycle used fishing nets due to sea salt stuck thereto, many foreign substances attached thereto, and their complex structure.

However, in January 2023, recycled fishing nets were successfully produced from polyester materials derived from used fishing nets. A team called Re:ism has been formed by the purse seine industry, net manufacturers, textile manufacturers, etc., beyond the borders of their respective industries and is developing a system of resource recycling through the collection, washing and pelletization of waste polyester fishing nets, their horizontal recycling for reproduced fishing nets as well as the development and sale of new products made from the recycled material.



Food tray produced from used fishing nets  
(First item to obtain the Eco-Mark certification  
as a product made from recycled fishery-related waste plastics)

## (6) Damage to Fisheries Caused by Wildlife and Mitigation Measures

- Reports have come out about damage to fisheries caused by wildlife such as Steller sea lions and *Asciidiella aspersa*. The Fisheries Agency provides support in survey on appearance of such wildlife, provision of information concerned, development of technologies on damage mitigation and vermin control activities.
- The amount of damage to fisheries caused by Steller sea lions was reduced from about 2 billion yen in FY2013 to about 0.7 billion yen in FY2021.
- Also, support has been provided in relation to approaches that seek to remove great cormorants and non-native species such as largemouth bass from inland waters.