R5-1 Collisions between boats and fishing gear

How many collisions happen between small boats and the fishing gear and oyster rafts placed in the sea, and why are they hard to prevent?

Readers	Fishery cooperatives, pleasure boat owners and marinas, people involved in maritime affairs, local government staff in charge, and others. It can be read without specialist knowledge. For those who want to know how many accidents happen to small boats, and what is known about collisions with fishing gear and rafts.
Takeaways	1. A large share of accidents at sea happen to small boats. According to the national government's white paper, 1,702 vessels were involved in accidents in 2025, and pleasure boats (motorboats, yachts and the like used for leisure), fishing boats and fishing charter boats that carry anglers accounted for about 70% of them (1,267 vessels). In the five prefectures of the Seto Inland Sea (excluding part of Yamaguchi Prefecture), of the 1,837 vessels involved in accidents in the 5 years from 2017 to 2021, 841 (46%) were pleasure boats. How many of these were collisions with fishing gear or rafts is not known. 2. The most common cause of collisions and groundings (accidents in which a boat runs onto a shoal or rocks) of fishing boats is insufficient lookout. In the Japan Coast Guard's 7th Region (northern Kyushu and the west of Yamaguchi Prefecture), of the 487 fishing boats involved in collisions, collisions with an object (single-vessel collisions) and groundings in 2015–2024, 291 (60%) were due to inadequate lookout. These are not values for the Seto Inland Sea. 3. The rules on AIS (a device that sends out its position by radio), which large ships are required to carry, are rules about ships. Fishing gear and oyster rafts are not covered by them. The Japan Transport Safety Board points out that there are many collisions with oyster rafts in Hiroshima Bay. It also points out that there are cases where waves make rafts hard to pick up on radar, and cases where the lights of their markers are out at night. However, we found no official statistics that count collisions with rafts or fishing gear.
After reading	In the sea of your own area, check who reports the positions of nets and rafts and the state of their lights and floats, and how they report them. When a boat strikes a raft or fishing gear, keep a record of the date, place, time, weather and the type of the other boat.

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This is an English translation. The Japanese edition is the authoritative text.

1. Key points

- A large share of accidents at sea happen to small boats. According to the national government's white paper, 1,702 vessels were involved in accidents in 2025, and pleasure boats (motorboats, yachts and the like used for leisure), fishing boats and fishing charter boats that carry anglers accounted for about 70% of them (1,267 vessels). [S1] In the five prefectures of the Seto Inland Sea (excluding part of Yamaguchi Prefecture), of the 1,837 vessels involved in accidents in the 5 years from 2017 to 2021, 841 (46%) were pleasure boats. [S3] How many of these were collisions with fishing gear or rafts is not known.

- The most common cause of collisions and groundings (accidents in which a boat runs onto a shoal or rocks) of fishing boats is insufficient lookout. In the Japan Coast Guard's 7th Region (northern Kyushu and the west of Yamaguchi Prefecture), of the 487 fishing boats involved in collisions, collisions with an object (single-vessel collisions) and groundings in 2015–2024, 291 (60%) were due to inadequate lookout. These are not values for the Seto Inland Sea. [S2]
- The rules on AIS (a device that sends out its position by radio), which large ships are required to carry, are rules about ships. Fishing gear and oyster rafts are not covered by them. [S8] The Japan Transport Safety Board points out that there are many collisions with oyster rafts in Hiroshima Bay. It also points out that there are cases where waves make rafts hard to pick up on radar, and cases where the lights of their markers are out at night. [S6] However, we found no official statistics that count collisions with rafts or fishing gear.

2. What is happening

Japan: a large share of accidents happen to small boats

According to the Cabinet Office's White Paper on Traffic Safety (2026 (Reiwa 8) edition), 1,702 vessels were involved in accidents in 2025. Accidents are counted by the number of vessels involved in them. Of these, 1,267 were small vessels (pleasure boats, fishing boats, and fishing charter boats that carry anglers), and the white paper describes this as "about 70% of the total". [S1] In the previous year's white paper (2025 (Reiwa 7) edition), small vessels made up 1,397 of the 1,817 vessels in 2024, "about 80% of the total". [S1] Calculated from the numbers of vessels, the share is 76.9% for 2024 and 74.4% for 2025 (this paper's calculation).

Coast Guard regions: pleasure boats and fishing boats

The Japan Coast Guard divides the seas of the whole country into 11 regions. Most of the Seto Inland Sea is in the 6th Region, and northern Kyushu and the west of Yamaguchi Prefecture are in the 7th Region.

The Seto Inland Sea small boat safety association posts data that it received from the 6th Regional Coast Guard Headquarters. In the five Seto Inland Sea prefectures, excluding part of Yamaguchi Prefecture, there were accidents involving 1,837 vessels in the 5 years 2017–2021 (Heisei 29 to Reiwa 3). The yearly average is 367 vessels. [S3] The breakdown by type of vessel is as shown in Table 1.

Table 1 Accidents in the five Seto Inland Sea prefectures (2017–2021, by type of vessel)

Type of vessel	Number of vessels	Share
Pleasure boats	841 vessels	46%
Fishing boats	396 vessels	21%
Cargo ships	255 vessels	14%
Other	142 vessels	8%
Tankers	99 vessels	5%
Passenger ships	72 vessels	4%
Fishing charter boats	32 vessels	2%

The source is [S3]. The shares are as given on the association's page.

When the accidents of the 841 pleasure boats are divided by type, the most common are boats left unable to move because of engine failure, at 193 (23%). These are followed by groundings at 142 (17%), boats left unable

to move for other reasons at 142 (17%), and collisions at 112 (13%). [S3] As a precaution for keeping a lookout, the same page lists checking beforehand for oyster rafts and for obstacles from construction work. [S3]

For fishing boats, there is a compilation by the 7th Regional Coast Guard Headquarters. These are not values for the Seto Inland Sea. In the 10 years 2015–2024 (Heisei 27 to Reiwa 6), 966 fishing boats were involved in accidents. Of these, 487 were involved in collisions, collisions with an object (single-vessel collisions) and groundings. By cause, inadequate lookout accounted for 291 (60%), falling asleep while operating the boat for 59 (12%), and improper boat handling for 54 (11%). [S2] Of the 487, 295 (61%) were fishing boats with one person on board, and among their causes, too, inadequate lookout accounted for 193 (65%). [S2]

Kagawa and the Bisan Seto: the routes of large ships overlap with fishing gear

The Bisan Seto is the sea between Okayama Prefecture and Kagawa Prefecture. Routes through which large ships pass are designated there. The centre of the Bisan Seto East Route is marked by floats with lights (light buoys); ships heading west pass along the 700-metre-wide northern side, and ships heading east along the 700-metre-wide southern side. Its total length is 20.1 nautical miles (about 37 km). The North Route is almost 700 metres wide and is only for ships heading west, and the South Route is 700 metres wide and is only for ships heading east. [S4]

The waters inside these routes are also fishing grounds. Komase-ami is a fishery in which a bag-shaped net is held on the seabed with anchors and the mouth of the net is spread open facing the tidal current. According to the Bisan Seto Vessel Traffic Service Center, the nets are 150–200 metres wide, and several boats often line up side by side. Fishing takes place from January to November, and the busiest period is from February to early August. [S4, S5] The Takamatsu Coast Guard Office points out that in the period when fishing is at its height (the peak fishing season), fishing is often carried out in a way that blocks the routes, and that the floats that show where the anchors are (anchor buoys) are spaced around 200 metres apart. The office's page states that accidents in which komase-ami fishing gear and the like is damaged happen several times every year (the page gives no date). When the tide is fast, the anchor buoys may be under water. [S5]

The Maritime Traffic Safety Act defines ships 200 metres or more in length as "giant vessels". A vessel engaged in fishing that is entering or leaving a route, crossing a route, or proceeding in a way that does not follow a route must keep out of the way of a giant vessel proceeding along the route if there is a risk of collision with it. [S7]

We found no recent official source that counts accidents in the waters of Kagawa Prefecture. According to a news report citing the Takamatsu Coast Guard Office, 84 vessels had accidents in the waters of Kagawa Prefecture in 2018, of which 31 were pleasure boats and 23 were fishing boats, and about half of the accidents were collisions. [S11]

Hiroshima Bay: collisions with oyster rafts

About 10,000 oyster rafts are placed in the aquaculture fishing grounds in Hiroshima Prefecture. This is a value that a prefectural research institute mentions in a 2020 report, and the report does not state as of when the number applies. [S9]

On its page on the safety of pleasure boats, the Japan Transport Safety Board states, regarding Hiroshima Bay, that "collision accidents with oyster rafts occur frequently". The same page lists 20 links to accident reports as collisions between pleasure boats and oyster rafts. The period covered is not stated. [S6] The board also asks for attention to the following three points. [S6]

- It is also possible that rafts have moved because of the tidal current and the like
- When there are waves, there are cases where it is hard to confirm rafts on radar
- At night, there are cases where the lights of the markers on rafts are out

We found no statistics counting collisions with oyster rafts year by year in the materials of either the Japan Coast Guard or Hiroshima Prefecture.

3. Why they are hard to prevent

No device that reports position

Large ships use AIS (Automatic Identification System) to let those around them know their own position and the direction in which they are heading. Among ships that travel between Japan and other countries, those that must carry it are ships with a gross tonnage (a number that expresses the size of a ship) of 300 tons or more and all passenger ships. Among ships that sail only within Japan, they are ships with a gross tonnage of 500 tons or more. Exceptions may also be allowed in some cases. [S8] The Japan Transport Safety Board explains that small vessels such as fishing boats have no legal obligation to install it, and mentions that, for small vessels without the obligation, simplified AIS units that can be installed relatively cheaply are also on the market. [S8]

The rules on AIS are about equipment to be carried on ships. They are not rules for fitting it to nets or rafts. Nets and rafts show their positions with lights and floats. However, there are cases where the lights on rafts are out, or where waves make rafts hard to pick up on radar. [S6] The floats on the anchors of nets may be under water when the tide is fast. [S5]

Relying on human eyes

For fishing boats in the 7th Region, the most common cause of collisions, collisions with an object and groundings was insufficient lookout (chapter 2). Of the 487 boats in collisions, collisions with an object and groundings, 295 (61%) were boats with one person on board. [S2] It is not easy to spot a raft whose lights are out, or a float pulled under by the tide, while operating a boat alone.

Few systems look to the "outside" of the rafts

As for systems that tell approaching boats where rafts are, within the scope of what this paper examined, we found none that is widely used.

4. Efforts that have begun

This chapter describes the efforts in which the publisher of this paper (SeatecHIROSHIMA Ltd.) is involved. We have not examined the efforts of other organisations and companies one by one.

Finding rafts in satellite images

Together with a laboratory at Hiroshima University, the company analysed the oyster rafts in Hiroshima Bay by combining satellite data (radar images and other imagery). The results of the analysis are checked by whether rafts actually floating in the sea could be found. Because some rafts are not found, it is meant to be used together with a visual lookout. [S10]

A beacon fitted to rafts

IKAK is a small beacon (a transmitter that sends out radio signals) fitted to oyster rafts. The company is developing it. It sends out only its own unique number and holds no position of its own. Its signal reaches only the area near the raft. When the smartphone on a boat passing nearby receives the signal, the place and time of reception are recorded. The company is developing a system that works out the position of the raft from those

records. No distinction is made as to which boat a position record came from. Records of the movements of boats and fishers are not published. [S10] The company is considering a combination in which beacons are fitted only to rafts at key points and rafts across the wider area are found by satellite. [S10]

Joint research

From October 2025 to August 2026, the four parties Hiroshima University, Marine Craft Kazenoko, I-NET Corp. and the company worked on joint research under the "Town & Gown initiative" being promoted by Kure City and Hiroshima University. It is research to build systems that support the management of oyster rafts and the safe navigation of boats. The company was responsible for developing the equipment (devices) and the system, and built, for research and development, a prototype of a system that shows the positions of rafts found by satellite on the smartphone or tablet of the person steering the boat. [S10]

The results of the research were reported at the interim report meeting (30 May 2026) and at the meeting to report on results and the state of implementation (19 October 2026). In fiscal 2026, the second year of the research is continuing. [S10] This paper does not give figures for the accuracy of finding rafts.

This system is not a replacement for charts, radar, AIS or visual lookout. It is an aid to navigation. [S10]

5. What is not yet known

Where there are no figures

- We found no official statistics counting collisions with fishing gear or oyster rafts, whether for Japan as a whole, for Hiroshima Bay or for the Bisan Seto. What exists is the 20 accident reports listed by the Japan Transport Safety Board (no period stated) and the Takamatsu Coast Guard Office's statement of "several every year". [S6, S5]
- We found no official sources showing the amount of damage to rafts or nets broken in collisions, the loss of the oysters or fish that were being raised, or actual cases of compensation.
- We could not confirm a value published by the prefecture for the number of oyster rafts in Hiroshima Bay alone. The figure of about 10,000 in this paper is a value for the prefecture as a whole. [S9]
- For the breakdown of accidents in the waters of Kagawa Prefecture, we could confirm only a news report covering the single year 2018. We have not found the announcement of the Takamatsu Coast Guard Office itself. [S11]

Figures to read with care

- "Inadequate lookout, 60%" is a value for collisions, collisions with an object and groundings of fishing boats in the 7th Region. It is not a value for fishing boats in the Seto Inland Sea (the 6th Region) or for pleasure boats. [S2]
- The page of the Seto Inland Sea small boat safety association also has a table that divides the collisions, collisions with an object and groundings of pleasure boats by cause. However, because the base number of vessels (227 vessels) and the total of the breakdown (277 vessels) do not match, this paper does not use it. [S3]
- The white paper's "about 70%" is the value for 2025, and its "about 80%" is the value for 2024. The share changes from year to year. [S1]

Limits of the new approaches

- In the satellite analysis, there are rafts that are not found (chapter 4).

- The beacon's signal reaches only the area near the raft. If no boat passes nearby, the raft's position is not recorded. [S10]
- The systems in chapter 4 are at the prototype stage. There are not yet any results confirming whether accidents have decreased.

Reliability and the publisher's position

We checked the numbers of accidents against the Cabinet Office's white paper and the materials of the Japan Coast Guard. We searched for statistics on collisions with rafts and fishing gear on the public pages of the Japan Coast Guard, the Japan Transport Safety Board, Hiroshima Prefecture and Kagawa Prefecture. The values for the five Seto Inland Sea prefectures are data provided by the 6th Region and posted by the association, and are not a publication of the 6th Region itself. The 2018 values for Kagawa Prefecture are based on a news report.

The publisher of this paper (SeatecHIROSHIMA Ltd.) is developing a system for identifying the positions of oyster rafts, and has an interest in the problem this paper deals with. Chapter 4 is the company's own description and has not been checked by a third party.

6. Sources

We examined materials published up to 25 November 2026. For the numbers of accidents, we used only values checked against the very materials listed as sources. Reliability: A = laws and regulations, statistics, materials of the national government or prefectures; B = papers, reports of research institutions; C = explanations by organisations, the company's pages; D = news reports.

ID	Source (publisher, year)	Type	Reliability	Chapters used
S1	White Paper on Traffic Safety: 2026 (Reiwa 8) edition; 2025 (Reiwa 7) edition (in Japanese) (Cabinet Office, 2026 and 2025. Part 2 Maritime Traffic, Chapter 1)	White paper	A	Chapters 1, 2, 5
S2	The current state of marine accidents and countermeasures, 2024 (Reiwa 6) edition (in Japanese) (7th Regional Coast Guard Headquarters. p.16 and p.18 in the printed page numbering. The version opened on 25 November 2026)	Statistics	A	Chapters 1–3, 5
S3	Marine accident data for the area of the 6th Regional Coast Guard Headquarters (in Japanese) (Seto Inland Sea small boat safety association. Data provided by the 6th Regional Coast Guard Headquarters, 2017 (Heisei 29) to 2021 (Reiwa 3))	Organisation	C	Chapters 1, 2, 5
S4	Bisan: features of the sea area (in Japanese) (Bisan Seto Vessel Traffic Service Center)	Explanatory	A	Chapter 2
S5	For safe passage through the Bisan Seto: komase-ami nets; points to note in the peak season of the komase-ami fishery (in Japanese) (Takamatsu Coast Guard Office)	Explanatory	A	Chapters 2, 3, 5
S6	For the safe operation of pleasure boats (in Japanese) (Japan Transport Safety Board. The section on Hiroshima Bay)	Explanatory	A	Chapters 1–3, 5
S7	Maritime Traffic Safety Act (in Japanese) (Act No. 115 of 1972 (Showa 47). Article 2, paragraph 2; Article 3, paragraph 2)	Law	A	Chapter 2
S8	AIS: regulations on ship equipment (Ministry of Communications Ordinance No. 6 of 1934 (Showa 9). Article 146-29); ships required to carry AIS (10th Regional Coast Guard Headquarters); presentation materials for the conference for pro - moting the safe operation of fishing boats (Japan Transport Safety Board, 27 October 2023. p.11–13 in the printed page numbering) (in Japanese)	Law, Explanatory	A	Chapters 1, 3

ID	Source (publisher, year)	Type	Reliability	Chapters used
S9	Development of an oyster aquaculture raft using recyclable materials (in Japanese) (Hiroshima Prefectural Technology Research Institute, Western Region Industrial Research Center, Research Report No. 63, 2020)	Report	B	Chapters 2, 5
S10	The company's pages: Ocean-data technology; Ocean data; IKAK (in Japanese) (SeatecHIROSHIMA Ltd., 2026)	Company	C	Chapters 4, 5
S11	Vessels that had accidents in the waters of Kagawa Prefecture: last year the most in the past 10 years (in Japanese) (KSB Setonaikai Broadcasting, 7 February 2019)	News	D	Chapters 2, 5

Related materials

- R8-1 "Hull paint and the sea": what paint releases into the sea, and the limits of surface treatment
- C2 "Solving the problems of the sea in combination": why the company puts ocean data at its centre and also works on biofouling