MAIB
MARINE ACCIDENT INVESTIGATION BRANCH

ACCIDENT REPORT

VERY SERIOUS MARINE CASUALTY | REPORT NO 2/2022 | FEBRUARY 2022

Flooding, capsize and foundering of the trawler *Diamond D* (SN100) 20 nautical miles north-east of Tynemouth, England on 16 August 2020

SUMMARY

At about 1500 on 16 August 2020, the UK-registered fishing vessel *Diamond D* (SN100) sank 20 nautical miles north-east of Tynemouth after suffering hull damage and subsequent water ingress while trying to uncross its towing wires. The two crew abandoned the vessel and boarded its liferaft. They were rescued by the crew of an RNLI lifeboat about 1 hour later and landed ashore to Tynemouth. Although shaken by their experience, neither crewman was injured.

Both crew had been working on deck for a prolonged period of time, during which the wheelhouse was left unattended. Consequently, they did not notice the bilge alarms, which would have alerted them to the flooding, until it was too late to take remedial action.

The rapid deployment of the vessel's liferaft, donning of lifejackets and manual activation of the vessel's Emergency Position Indicating Radio Beacon (EPIRB), meant that the crew remained safe and were quickly located.

Diamond D

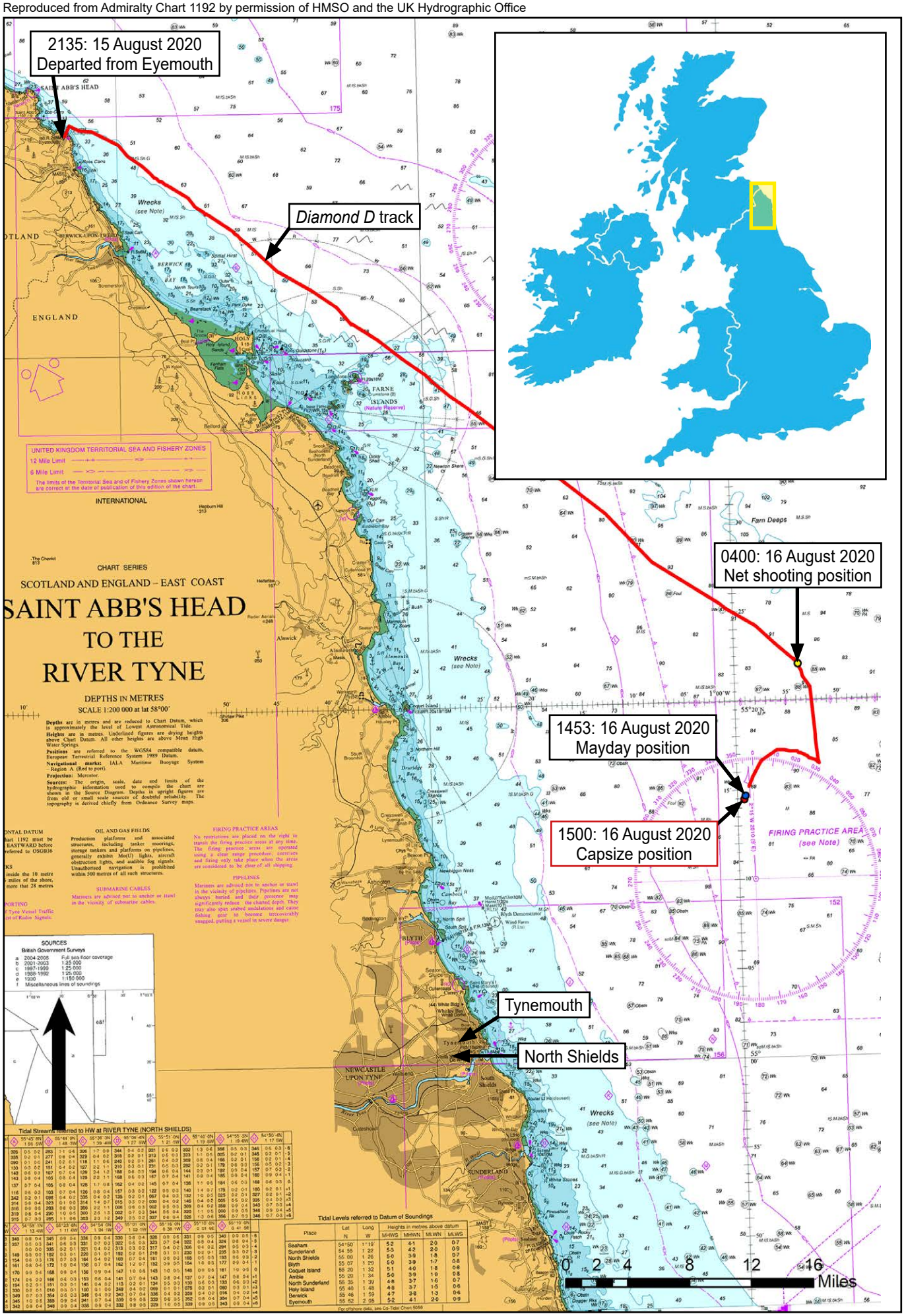

Figure 1: Extract from Admiralty Chart 1192

FACTUAL INFORMATION

Narrative

At about 2135 on 15 August 2020, the 15.67m prawn trawler *Diamond D* departed from Eyemouth, Scotland, with its permanent skipper and owner on board **(Figure 1)**. The vessel, having operated out of the Scottish port for 60 days over the summer season, was headed for North Shields, England, for annual maintenance and an out of water survey.

During the passage, the owner decided to undertake a trawl to catch fish for his restaurant and, at about 0400 on 16 August, the owner and skipper shot away the fishing gear. The skipper remained on watch in the wheelhouse and the owner went to the cabin to get some sleep. The winds were light, the seawater temperature was 13°C and there was very little swell.

At about 0700, *Diamond D* began to slow down and then stopped. Thinking that the trawl gear had become fouled on the seabed, the skipper took the engine out of gear and called to the owner to help on deck. The owner went forward and operated the main winch to lift the trawl gear. He quickly realised that the gear had not snagged on a seabed obstruction, but it was very heavy and he suspected that a boulder had been picked up in the net.

While the owner remained forward to operate the main trawl winch, the skipper went to the transom to monitor the trawl gear as it was being hauled.

As the trawl gear was being hauled in, it became apparent that the towing wires had crossed **(Figure 2)**. To uncross the wires, the owner repeatedly heaved in and released each wire in turn while the skipper periodically turned *Diamond D* around the suspended gear. During this process the trawl doors were heard hitting the vessel's hull several times. After 2 to 3 hours, the towing wires finally uncrossed.

Once on board the vessel, the trawl doors were secured and the towing wires attached to the sweeps **(Figure 3)**. The net was then hauled up until it could be fed onto the net drum at the vessel's stern. Because of the weight in the net, the net drum struggled to haul it in. After a further 2 hours, the dog rope[1] was able to be brought on board and was then led through a pulley on the starboard side of the gallows and attached to the starboard towing wire. During this 2 hour period *Diamond D* had slowly developed a starboard list of about 10°.

At 1359, one of the owner's relatives contacted the coastguard and advised them that *Diamond D* was overdue. The coastguard attempted to contact *Diamond D* on very high frequency (VHF) radio channel 16 but received no reply.

The skipper and owner began to pull the net around to the starboard side, which caused the vessel's list to increase to around 20°. The skipper became concerned about the increasing list as water began to flow onto the deck through the starboard aft freeing port. The skipper instructed the owner to cut the dog rope to allow the net to return astern and hang off the net drum on the vessel's centreline. Both the owner and skipper expected the vessel would then return upright; however, the list remained the same. They then cut away the net but this did not reduce the starboard list. The skipper climbed onto the top of the shelter deck to check that the cut away net was clear of the vessel. The owner made his way inside the vessel and checked the fish room and the forepeak store. He observed a considerable amount of water in both spaces and shouted a warning to the skipper, informing him of what he had found. The skipper reached through an open wheelhouse window and, at 1453, used *Diamond D*'s main VHF radio to call Humber coastguard on channel 16 and request assistance. He informed the coastguard that the vessel had a substantial starboard list. Humber coastguard tasked the RNLI to attend and, at 1501, the Tynemouth all-weather lifeboat (ALB) was launched to proceed to *Diamond D*'s position.

[1] A rope attached to the fishing net, leading to the fish bag to allow for it to be hauled.

For illustrative purposes only: not to scale

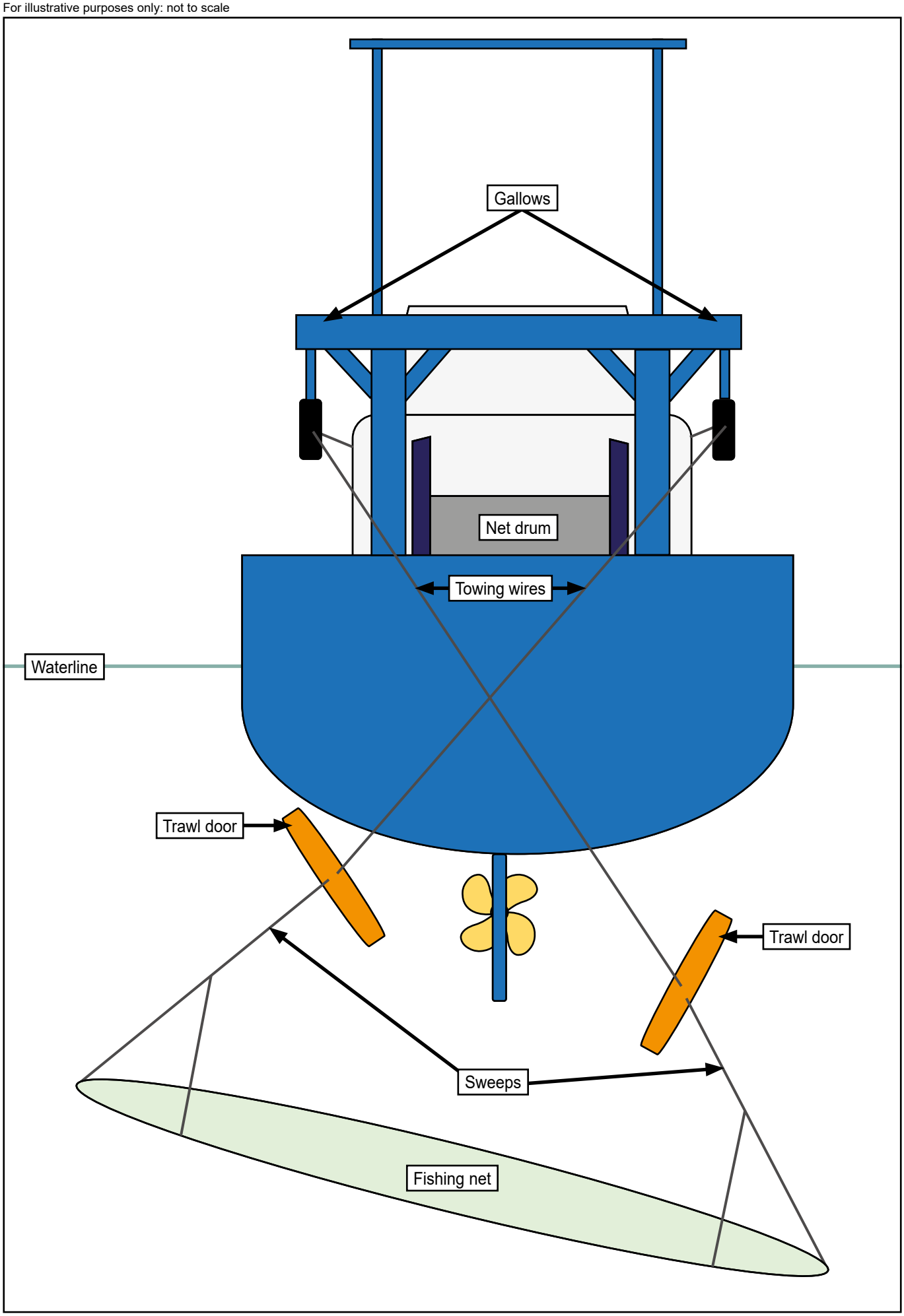

Figure 2: Graphical representation of a likely scenario, showing the towing wires crossed

Image courtesy of Australian Fisheries Management Authority

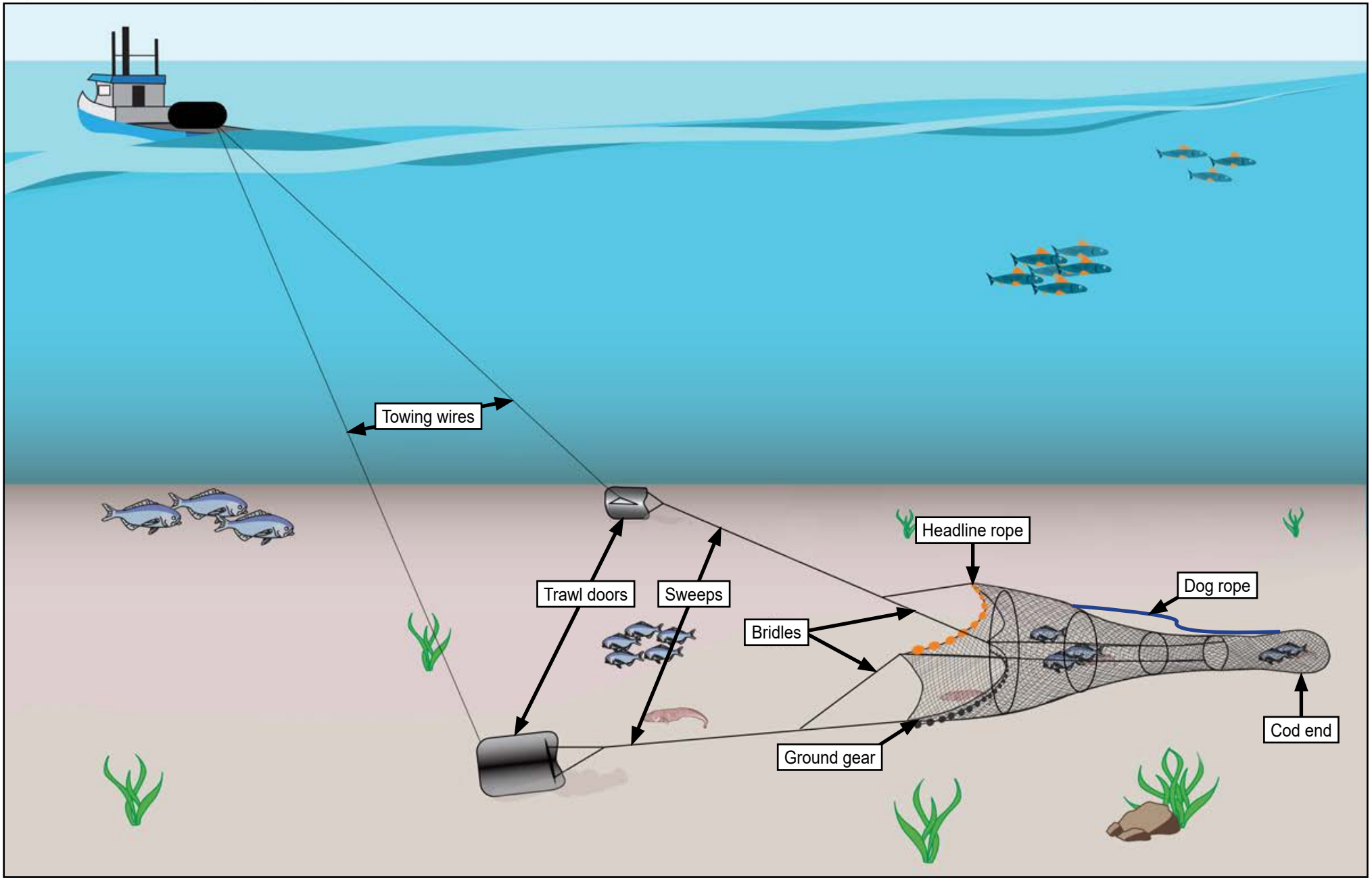

Figure 3: Trawling arrangement

The skipper then went to the liferaft stowed in front of the wheelhouse, removed the securing straps and, having passed the painter[2] to the owner on the main deck, rolled it into the water. The owner tied the painter to a handrail and pulled it to inflate the liferaft. The skipper took the EPIRB from the wheelhouse roof and a handheld VHF radio from inside the wheelhouse and passed them to the owner, who threw them into the liferaft tied alongside the stern of the heavily listing vessel.

The owner grabbed several lifejackets, a box of flares and a small personal bag containing medication and dry clothes and, having tossed them into the liferaft, jumped into it from the main deck. At about 1500, *Diamond D* began to capsize and the skipper jumped from the top of the shelter deck into the water. The shock of entering the cold water meant that he found it difficult to swim to the liferaft. The owner paddled the liferaft towards the skipper and, when they met, pulled him on board. *Diamond D* sank shortly afterwards.

Once in the liferaft, the owner gave the skipper the dry clothes to change into. They both donned lifejackets and the owner set off a red parachute rocket flare. At 1520, the skipper activated the EPIRB and attempted to contact the coastguard with the handheld VHF radio but did not receive a reply.

At 1530, a rescue helicopter was tasked by the coastguard to assist with any possible casualty evacuation. At 1552, as the ALB approached the distress position, the owner successfully made contact with the ALB coxswain on the handheld VHF radio, then set off another red parachute rocket flare to guide them to the liferaft.

At 1558, the ALB arrived alongside the liferaft, followed by the helicopter's arrival shortly afterwards. The skipper and the owner were brought on board the lifeboat and the helicopter was released by the coastguard once it was established that no medical treatment was required. The ALB crew retrieved *Diamond D*'s liferaft and some debris and, at 1735, arrived back at Tynemouth lifeboat station.

Diamond D

Diamond D was built in 1973 by James Noble of Fraserburgh. Several modifications were made to the vessel in its lifetime, including fitting a shelter over the working foredeck and raising the wheelhouse to improve visibility. The wheelhouse was aft of midships, above a six-berth cabin and the engine room **(Figure 4)**. Forward of the engine room was a fish hold and a forepeak store. The vessel had no watertight subdivision of spaces along its length and a common bilge ran from right forward to right aft. Forward of the wheelhouse, above the engine room and fish hold, was a covered working deck (shelter deck) where the catch was processed, which also housed the 5t main trawl winch. Above the shelter deck on the starboard side was an aluminium lifting frame that enabled the fishing net to be lifted and emptied into a hopper below. Aft of the wheelhouse was the open working deck with trawl gear and a 2t rated net drum.

The owner purchased *Diamond D* in 2018 and carried out extensive work to improve reliability, including the replacement of engine water cooling pipes. Additionally, the majority of the lifesaving equipment was renewed and a new EPIRB and six-person liferaft were fitted.

Crew

Diamond D usually operated with three crew members, a skipper and two deck hands. However, because the two deck hands had gone on leave, the skipper was accompanied by the owner for the relocation voyage.

The skipper was a 46-year-old UK national; he had fished for most of his adult life and had skippered *Diamond D* since 2018. He held an under 16.5m skipper's certificate of competency.

Diamond D's owner was a 38-year-old UK national; he held an under 16.5m skipper's certificate of competency and had been fishing commercially for about 7 years. In addition to *Diamond D*, he owned several other fishing vessels, all of which were under 10m in length. He also owned a restaurant on the

[2] A connecting line between the vessel and the liferaft used to activate the inflation and secure the liferaft to the vessel.

For illustrative purposes only: not to scale

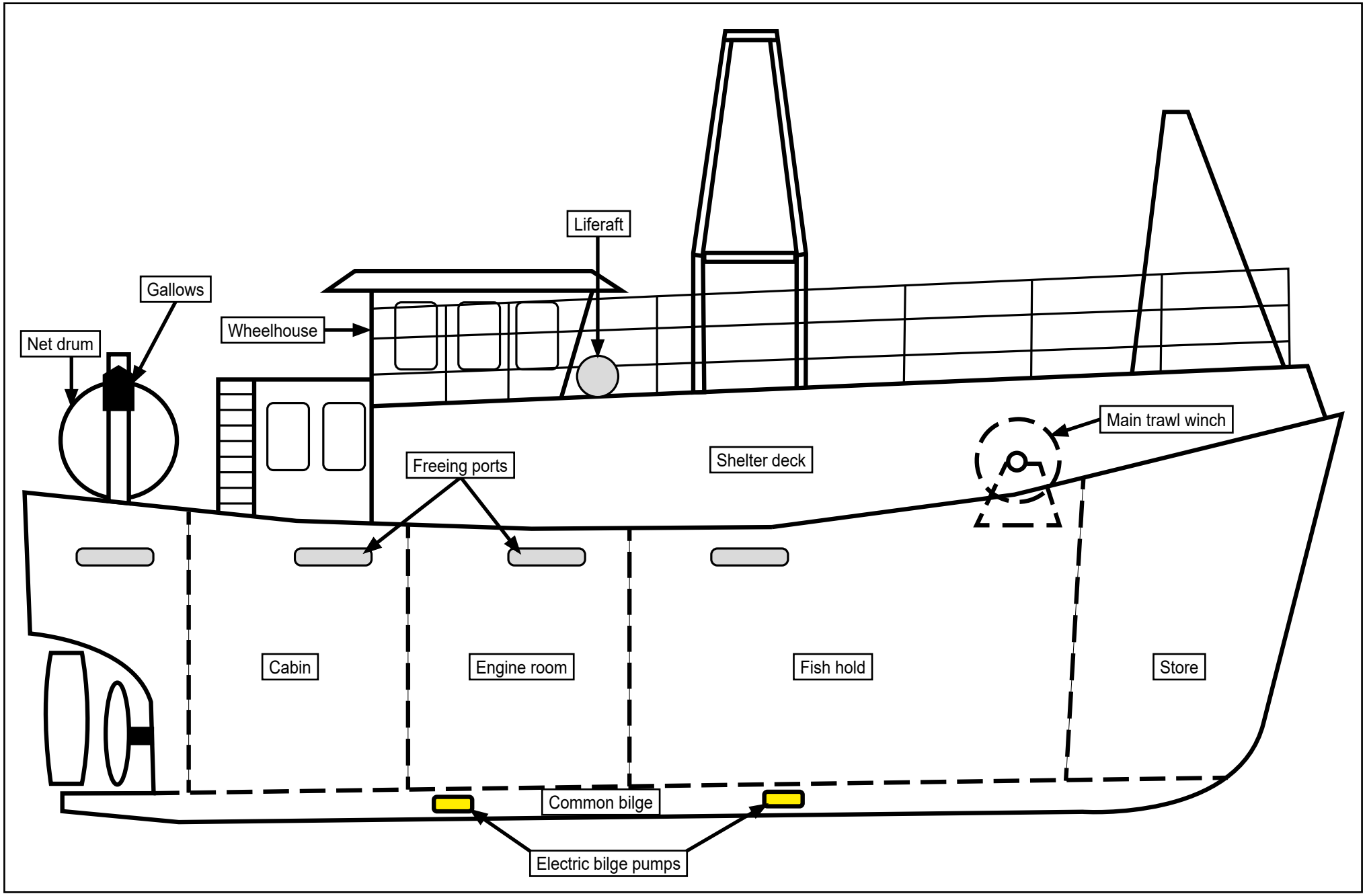

Figure 4: General vessel arrangement

fish quay in North Shields. Both the skipper and the owner had completed all the mandatory training required to work on a UK-flagged fishing vessel. There was no evidence that any emergency training drills had been completed on board *Diamond D*, or that the crew routinely wore personal flotation devices (PFD) while working on deck.

Bilge pumping and alarms

There were four means of pumping water from the bilges on board. *Diamond D* had two 4800 litres/hour capacity electric-powered bilge pumps that could be operated in manual or automatic mode. The electric pumps were located near the centreline of the vessel below the fish room and engine room aft bulkhead. A bilge level float switch was located next to each pump that activated the pumps when in automatic mode and sounded high-level alarms inside the wheelhouse. There were no bilge alarm sounders outside the wheelhouse or any visual methods of alerting crew on deck to the bilge alarm status. Additionally, two engine-driven fire and deck wash pumps' suctions could be set up manually to pump the bilges. The changeover valves to pump bilge water overboard were operated locally in the engine room. Both the fire and deck wash pumps had a pumping capacity of 8400 litres/hour.

Survey and certification

Diamond D had not had a full stability assessment, but was regularly roll tested to satisfy the Maritime and Coastguard Agency (MCA) survey and inspection requirements.

On 24 May 2014, *Diamond D* suffered damage to its bow when it ran aground. On 11 August 2014, following extensive repairs, a condition survey was undertaken by an independent surveyor. The survey report stated:

> *At waterline level aft there has been cladding fitted and at port and starboard quarters some seam stopper will require attention over a period of time but planking generally appeared to be fair with no major disturbances or deterioration evident.* [sic]
>
> *In general, we found this vessel to be sound and in fair condition although showing signs of age in a number of areas where renewals and upgrading will be necessary over a period of time as part of the maintenance programme.* [sic]

On 18 June 2018, following the owner's purchase of the vessel, the MCA carried out an interim inspection of *Diamond D* and issued a fishing vessel certificate that was valid until 31 May 2020. This was later extended to 31 August 2020, due to the UK government's coronavirus-related concessions.

On 19 September 2019, an insurance valuation survey was carried out. The report of the survey stated:

> *The outside of the hull is painted and anti-fouled below the waterline; this is in satisfactory condition.*
>
> *The planking was hammer or spike tested externally and internally where it could be reached. There was some surface softness.*

During a maintenance period in 2019, some refastening of the hull planking took place, mostly around both sides of the stern section of the vessel **(Figure 5)**.

Guidance for fishermen on the risk of flooding

The MCA's Marine Guidance Notice (MGN) 165 (F) Fishing Vessels: The Risk of Flooding, provided advice on the prevention of flooding, and guidance on the actions to take in the event of a flooding emergency.

Section 6 of the MCA's Fishermen's Safety Guide provided guidance in the event of emergencies. It contained a subsection entitled *Hull damage/taking water/sinking guidance*. As a risk mitigation measure, the guide advised crews to '*check unattended spaces regularly*'.

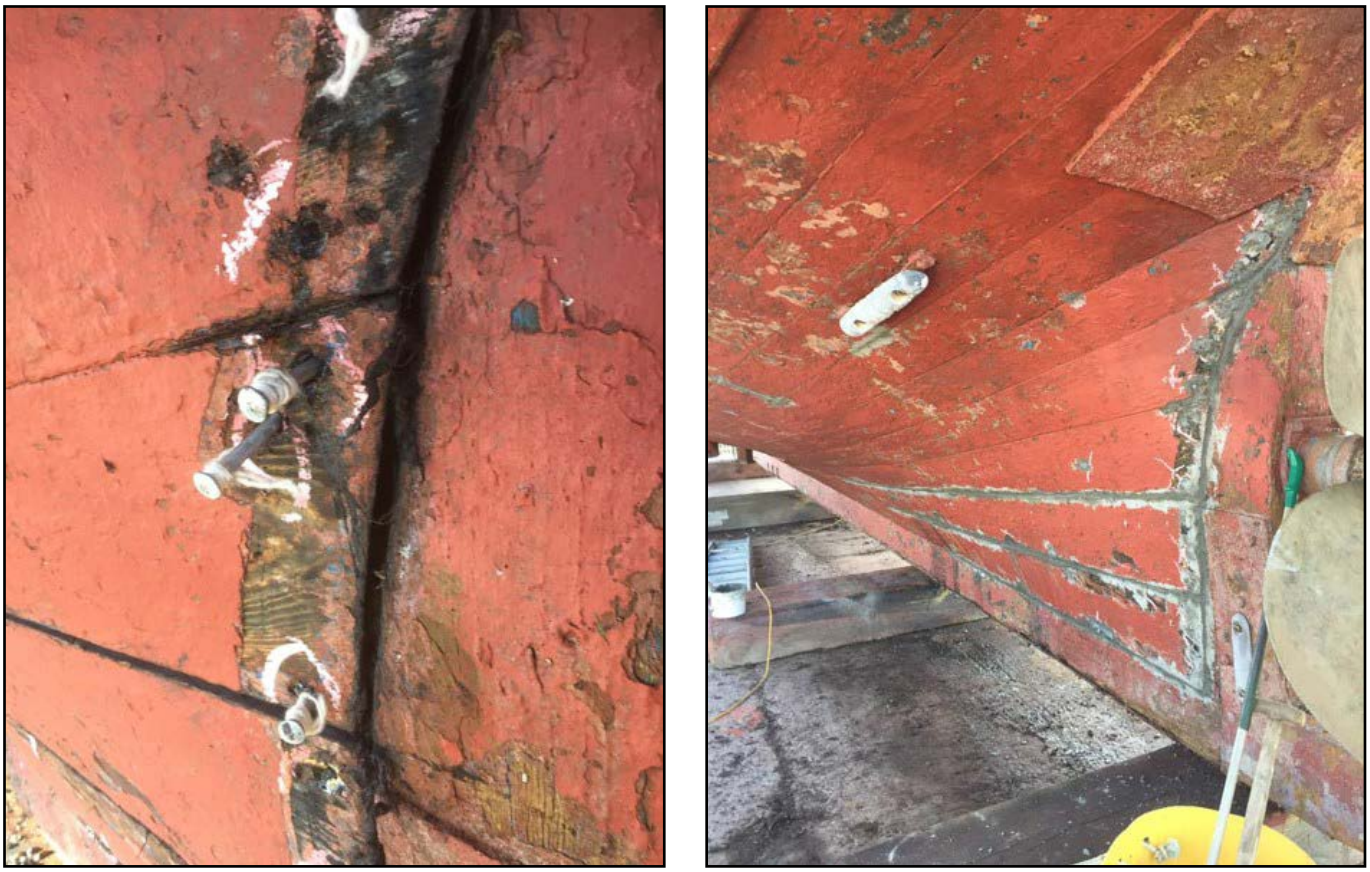

Figure 5: Hull refastening

Similar accidents

During the 10 year period prior to this accident, 185 flooding incidents on board UK registered fishing vessels were reported to the MAIB, of which 69 resulted in the loss of the vessel. These statistics included accidents where the flooding source was not identified.

On 3 March 2017, the 23m trawler *Ocean Way* sank after uncontrolled flooding in the aft compartment (MAIB report 10/2018[3]). The vessel's starboard net had become fast on the seabed and in the attempts to free the net the port trawl door struck the hull heavily and an aft compartment started to flood. Onboard pumps were unable to keep up with the water ingress and the vessel eventually sank.

On 21 January 2016, the 16m potter *Majestic* sank as a result of unidentified flooding in its engine room (MAIB report 16/2016[4]). The engine room's bilge alarm sounded in the wheelhouse, but it was not heard by the crew who were busy working on deck. The flooding went unnoticed for up to 1 hour before the crew became aware. The crew did not routinely conduct emergency drills and they did not habitually wear PFDs when working on deck.

[3] https://www.gov.uk/maib-reports/flooding-and-sinking-of-stern-trawler-ocean-way

[4] https://www.gov.uk/maib-reports/flooding-and-sinking-of-the-wooden-potter-majestic

ANALYSIS

The accident

Diamond D capsized and foundered because of flooding and loss of stability. Fortunately, the crew were able to abandon *Diamond D* and were rescued unharmed from the vessel's liferaft. The causes of the flooding and capsize, the crew's attempts to recover the fishing gear, and their response to the emergency situation will be discussed in this section of the report.

Source of the flooding

The owner renewed several engine cooling water pipes in 2018 and *Diamond D* had been surveyed since that time. It is therefore considered unlikely that an engine pipe failure caused the flooding. Although the vessel developed a significant list while the crew attempted to recover the fishing gear and water flowed onto the deck through the freeing port, no down flooding was apparent.

The hull planking at the stern of *Diamond D* was almost 37 years old and surveys had identified minor soft patches. When the planking was hit by the heavy trawl doors, it is most likely that the damage allowed water to flood into the vessel. The flood water was able to spread through the vessel's internal spaces because there were no watertight bulkheads to contain it. As it was a frequent occurrence, the sound of the trawl doors hitting the hull did not cause concern to the skipper or owner.

The crew expected *Diamond D* to develop a list when the net was hauled around to the starboard side of the vessel. However, the continued difficulty of hauling the net up and the severity of the list triggered the decision to cut the dog rope and allow the net to return to the vessels' stern. The crew only realised there was another problem when the list did not change after the rope was cut and, following checks, noticed the flooding of the hull.

The capsize

Although *Diamond D*'s automatic electric bilge pumps operated, they were unable to keep up with the rate of water ingress. Had the internal spaces been checked after the trawl doors hit the hull, or an external bilge alarm been fitted to the wheelhouse, the crew could have been alerted to the flooding much earlier. There may have been time to start the engine driven bilge pumps to help stem the water ingress and possibly to identify the source of the leak. However, by the time the flooding was discovered the vessel was in a near capsize condition. There was only time to launch the liferaft, gather safety equipment and jump clear as *Diamond D* rolled over.

Because of the reduced crewing, there was nobody available to check spaces for potential flooding and, because the wheelhouse remained unmanned for a prolonged period, the bilge alarm illuminated and sounding in the wheelhouse went unnoticed.

Vessel manning

Diamond D's owner employed a crew of three to safely undertake fishing operations. The owner and skipper had decided that only two crew were required for the relocation voyage. However, the decision to change the plan from a simple relocation voyage to undertake a period of fishing introduced additional risks that could not be mitigated due to the reduced manning level on board.

Abandonment

The skipper's quick thinking to alert the coastguard by VHF radio, deploy the liferaft, and take the EPIRB from the wheelhouse roof into the liferaft and activate it almost certainly saved the lives of the two men.

Neither man was wearing a PFD and rather than donning the vessel's lifejackets when it became evident they were in grave peril the lifejackets were thrown into the liferaft. After jumping off the capsizing vessel without a lifejacket, the skipper was fortunate that the owner was able to paddle the liferaft to him and pull him on board before he succumbed to the debilitating effects of immersion in the cold seawater.

CONCLUSIONS

- *Diamond D* foundered because the flooding of the hull went unnoticed until it was too late for the crew to take remedial action.
- It is almost certain that the hull was damaged when it was hit by the trawl doors, which then allowed an ingress of seawater. The flood water was able to spread through the vessel as there were no watertight bulkheads to contain it.
- While uncrossing the towing wires, the crew considered the trawl doors hitting the hull to be a normal occurrence and did not recognise the danger of damage to the hull planking. Consequently, they did not verify the vessel's watertight integrity.
- The flooding went unnoticed because the crew did not see or hear the wheelhouse bilge alarms and were task-focused, dealing with crossed towing wires and a heavy weight in the fishing net.
- Had there been a third crew member on board and the wheelhouse not left unmanned for 7 hours, the bilge alarms may have alerted the crew to the flooding of the hull. This could have given the crew time to use the additional pumping capacity available.
- The wearing of lifejackets undoubtedly saves lives. The two crew were fortunate that the liferaft inflated correctly and that both men did not end up in the water, as neither was wearing a lifejacket when *Diamond D* capsized.
- When it became apparent that *Diamond D* was in peril, the VHF call to alert the coastguard and the signal from the EPIRB assisted the rescue services in locating the crew in the liferaft in a timely manner.

ACTION TAKEN

MAIB actions

The MAIB has issued a safety flyer to the fishing industry.

Actions taken by other organisations

Diamond D's owner has fitted personal locator beacons to every PFD on all his vessels and has introduced a requirement for PFDs to be worn by crew when working on deck.

RECOMMENDATIONS

Although no recommendations are made in this report, it should nevertheless serve as a reminder to fishing vessel crews to be prepared for flooding emergencies, to regularly check under waterline spaces and to wear PFDs at all times while working on deck.

VESSEL PARTICULARS	
Vessel's name	*Diamond D*
Flag	UK
Classification society	Not applicable
IMO number/fishing numbers	SN100
Owner	Privately owned
Type	Prawn trawler
Year of build	1973
Construction	Wood
Length overall	16.87m
Registered length	15.67m
Gross tonnage	48t
Minimum safe manning	Not applicable

VOYAGE PARTICULARS	
Port of departure	Eyemouth, Scotland
Port of arrival	North Shields, England (intended)
Type of voyage	Fishing
Manning	2

MARINE CASUALTY INFORMATION	
Date and time	16 August 2020 at about 1500
Type of marine casualty or incident	Very Serious Marine Casualty
Location of incident	20 nautical miles north-east of Tynemouth
Injuries/fatalities	None
Damage/environmental impact	Loss of vessel
Weather conditions	Fine and dry with light airs
Persons on board	2