Wester Ross spring-spawning herring and associated wildlife report 2025

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8th May 2025

Spawning herring surveys in 2025 were supported by members of the local community including / and:

Summary

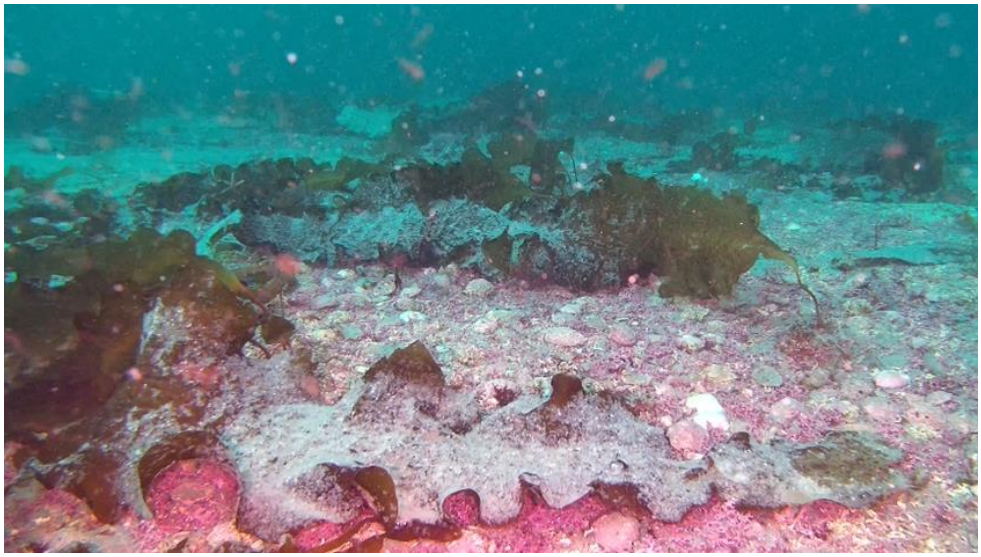
This report describes observations of marine wildlife thought to be associated with shoals of maturing herring in coastal waters near Gairloch, Wester Ross, between February and early April 2025; and subsequent spawning of herring verified by the discovery of herring eggs on the seabed nearby.

Marine mammal sightings within 2km of the shore included up to 40 dolphins (assumed to be mostly common), 60 porpoises, 50 grey seals, 3 minke whales (perhaps 5 in the area) and one or perhaps two humpback whales. Up to 120 gannets were seen in the main feeding area and 300+ gulls (several spp.). Observations possibly amounted (in kg) to one of Scotland's biggest springtime coastal wildlife events.

On 20th March 2025, a drop-down video survey of the seabed to the northwest of Loch Gairloch failed to identify and record herring eggs in the area where much sea mammal activity was observed on 9th March 2025 and where herring eggs were recorded in March 2024. However, on 3rd April 2025, herring eggs were found on maerl gravel and sugar kelp fronds on the seabed about 800m west of the shore at Opinan (southwest of Gairloch) in water depths of 10m to 15m. High densities of recently hatched herring larvae were taken with a plankton net in the water column on the same day demonstrating successful spawning by herring. Eggs collected from this location on 4th April 2025 were mostly eyed.

Observations and seabed surveys demonstrate successful spawning of herring to the southwest of Gairloch in 2025, with a herring spawning event around 20th March to 23rd March. With additional support in future years, associated marine wildlife and spawning grounds could be monitored and mapped in more detail.

(right) Herring eggs on shelly maerl gravel and on sugar kelp fronds, west of Opinan; 3rd April 2025. Video screenshot image ©Little Loch Broom Marine Life Surveys



1. Introduction

February and March have become months when the attention of some people in Wester Ross focusses on looking out for signs of herring shoals moving inshore to spawn (see Cunningham, 2024 for background).

In March 2024, signs of herring spawning were observed to the northwest of Gairloch. Cloudy water associated with herring spawning could be seen from land and from space (see Cunningham, 2024; Keane, 2024, WOSHH, 2024). Herring eggs were found on the seabed within 2km of the shore near Gairloch in 2018, 2019 and 2024.

To learn about spring spawning herring by Wester Ross in 2025, sea water samples were collected and filtered for herring eDNA at Opinan (to SW of Gairloch, Wester Ross) and Melvaig (to NW of Gairloch) nearly every three days from 8th February 2025 to 17th April 2025 as part of the West of Scotland Herring Hunt [WOSHH] project. Some results of sampling and surveys by Wester Ross in previous years be found on the WOSHH website. Results from water sampling for herring eDNA in 2024 and 2025 will follow on the WOSHH website.

2. Wildlife associated with herring shoals

Travelling (often by e-bike) to water sampling locations provided opportunities for looking with binoculars for signs of herring shoals from roadside vantage points. In 2025, notable sightings were reported on the Gairloch and Loch Ewe wildlife sightings facebook page usually within a few minutes of when they were seen to alert other interested people and encourage additional observation.

Table 1 provides a summary of observations of marine wildlife thought to be associated with herring shoals and spawning herring between February and early April 2025. Most of these observations were made from land. Table 1 is not exhaustive; there were other anecdotal reports. Some local fishermen were said to have reported catching herring in prawn trawls and prawn creels in February and early March 2025.

(*below) local observers watching a feeding aggregation which included a humpback whale, 3 minke whales, porpoises, grey seals, 100+ gannets, many gulls and shags; from the roadside between North Erradale and Peterburn, 9th March 2024. The main gathering of sea birds and sea mammals was about 1500m offshore, about 2km away. In future years, a high-quality video camera with a suitable telephoto lens may be able to record BBC Springwatch quality sequences from near here, helping to extend awareness of one of Scotland's biggest [in terms of biomass] wildlife spectacles of the year; helping to revive interest in herring.*

Table 1. Some observations of wildlife that were assumed to be associated with herring shoals within 10km of Gairloch, Wester Ross, February to early April 2025. Locations are to within about 500m to 1km. Some animals moved around within an area of 2kmØ or more during the days of observation.

Obs #	Date	Species	Number	Easting	Northing	Observer	**Observer location** (using binoculars from roadside unless otherwise stated)	Weather comment	Sea state comment	Comments
1	08-Feb-25	dolphin sp.	5	57.68507	-5.80561	RW	Opinan	light easterly		
2	08-Feb-25	?humpback	1	57.8249	-5.86447	PC	Aultgrishan		calm	also gulls on water to NW of Melvaig
3	10-Feb-25	gannet	15	57.68507	-5.80561	RW	Opinan	SE breze	calm	gannets half mile offshore same place as dolphins on 8 Feb
4	13-Feb-25	dolphin sp.	100	57.76813	-5.90551	PC	Peterburn			dolphins far out, number rough estimate
5	13-Feb-25	porpoise	60	57.76784	-5.8407	PC	Peterburn	NE breeze	calm	porpoises within 2km
6	13-Feb-25	dolphin sp.	2	57.68507	-5.80561	RW	Opinan			
7	13-Feb-25	gannet	35	57.68507	-5.80561	RW	Opinan			
8	16-Feb-25	dolphin sp.	5	57.68507	-5.80561	PC	seen from near Red Point farm	E breeze		
9	17-Feb-25	gannet	10	57.76784	-5.8407	PC	Peterburn			
										no sightings from 22 Feb to 6 March sea rough during this period
10	07-Mar-25	minke	1	57.79044	-5.84627	PC	Aultgrishan	improving	big swell	reported to HWDT Whaletrack
11	08-Mar-25	humpback	1	57.76784	-5.8407	PC	Peterburn			mostly 2km west of Peterburn
12	08-Mar-25	dolphin sp.	40	57.76784	-5.8407	PC	Peterburn			to within 1.5km of North Erradale - hard to count
13	09-Mar-25	gannet	120	57.76784	-5.8407	PC	Peterburn	light N wind	calm	about 2km
14	09-Mar-25	humpback	1	57.76784	-5.8407	PC	Peterburn			mostly 1.5km of North Erradale
15	09-Mar-25	minke	3	57.76784	-5.8407	PC	Peterburn			to within 1km of North Erradale headland
16	09-Mar-25	porpoise	30	57.76784	-5.8407	PC	Peterburn			mostly 1.5km of North Erradale - hard to count
17	09-Mar-25	grey seal	20	57.76784	-5.8407	PC	Peterburn			mostly 1.5km of North Erradale
18	09-Mar-25	dolphin sp.	8	57.68598	-5.81331	SW	Opinan			
19	09-Mar-25	gulls	many	57.68598	-5.81331	SW	Opinan			gulls not always recorded!
20	09-Mar-25	humpback	1	57.67362	-5.84305	PL	seen from near Red Point			reported on facebook
21	09-Mar-25	minke	2	57.67362	-5.84305	PL	seen from near Red Point			reported on facebook
22	12-Mar-25	gannet	2	57.76784	-5.8407	PC	Peterburn	strong S wind	sea rough	no other sightings from Melvaig or Opinan
23	14-Mar-25	humpback	1	57.76784	-5.8407	SN	from boat 2km west of North Erradale			from boat with James Cameron
24	14-Mar-25	minke	2	57.76784	-5.8407	SN	from boat 2km west of North Erradale			from boat with James Cameron
25	14-Mar-25	grey seal	50	57.76784	-5.8407	SN	from boat 2km west of North Erradale			from boat with James Cameron
26	14-Mar-25	dolphin	?	57.76784	-5.8407	SN	from boat 2km west of North Erradale			from boat with James Cameron
27	18-Mar-25	minke	1	57.79264	-5.82327	PC	Aultgrishan		calm	
28	19-Mar-25	gannet	16	57.68557	-5.82681	PC	Opinan			quite far out
29	20-Mar-25	whale	1	57.76784	-5.8407	SN	seen from boat 2km west of Peterburn		calm	egg survey expedition, SN watching
30	20-Mar-25	grey seal	12	57.76784	-5.8407	PC	seen from boat 2km west of North Erradale			egg survey expedition, SN watching
31	20-Mar-25	porpoise	5	57.76784	-5.8407	SN	seen from boat 2km west of North Erradale			egg survey expedition, SN watching
32	21-Mar-25	minke	1	57.68507	-5.80561	PC	Opinan			
33	21-Mar-25	gannet	30	57.68507	-5.80561	PC	Opinan			
34	21-Mar-25	minke	2	57.67362	-5.84305	GM	seen fron near Red Point			
35	21-Mar-25	?fin	1	57.67362	-5.84305	GM	seen fron near Red Point			
36	22-Mar-25	humpback	1	57.76784	-5.8407	PC	Peterburn			
37	23-Mar-25	minke	2	57.71662	-5.76106	PC	seen from near Carn Dearg	fresh SW	rough	minke whales very active with gannets nearby
38	23-Mar-25	gannet	60	57.71662	-5.76106	PC	seen from near Carn Dearg			
39	23-Mar-25	humpback	1	57.76784	-5.8407	MM	reported on Heb&NWScotCetS facebook			approx location based on photo on facebook
40	23-Mar-25	sandy water		57.70472	-5.8219	CG	seen from top of Sidhean Mor			reported on facebook
										fishers anecdotes indicate herring moved offshore
41	02-Apr-25	minke	1	57.68507	-5.80561	SW	Opinan			
42	03-Apr-25	herring eggs	layers	VideoLog	VideoLog	PC	below boat located to west of Opinan			videos of eggs on maerly gravel and sugar kelp
43	03-Apr-25	herring larvae	100s	VideoLog	VideoLog	PC	below boat located to west of Opinan			in plankton trawls
44	04-Apr-25	herring eggs	100s			SN	divers exploring seabed to west of Opinan			collected by SN on 4 Apr, egg layer est. 6mm to 8mm thick
										no other sightings in early April from Melvaig or Opinan

Observers:

RW Roger & Sue Ward
SW Sue Ward
PC Peter Cunningham
SN Sara Nason
PL Peter Lynn
GM Gordon Macintosh
CG Christian Gudgeon
MM Martin Macbeth

Thankyou to everyone else who joined in to help record sightings and report on Gairloch and Loch Ewe Wildlife Sightings facebook page or Heb and NW Scotland Wildlife Sightings facebook page or HWDT Whaletrack website

Species notes for animals thought to be associated with spawning herring in 2025 (all seen from within 10km of Gairloch):

Humpback whale

One or possibly two humpback whales were present in the area during February and March 2025.

The first observation of a humpback whale thought to be associated with herring shoals in 2025 was to the northwest of Melvaig on 8th February. From 8th March to 23rd March, there were regular sightings of a humpback whale (assumed to be the same animal) typically between 1km and 2km from the shore to the west of North Erradale – Aultgrishan (northwest of Gairloch). A humpback whale was also reported to the west of Red Point (southwest of Gairloch) on 9th March, thought to be a different animal from the one seen on the same day to the northwest of Gairloch.

The humpback whale seen near North Erradale usually surfaced and dived without its tail fluke appearing. The tail fluke was seen just twice. This behaviour was assumed to be because the water was too shallow for steeply descending dives. On 9th March 2025, one or more minke whales regularly surfaced close to the humpback whale (within 100m).

In March 2025, other humpback whales were reported on the HWDT Whale track page and the NW Scotland Cetacean sightings facebook page in the Minch area as follows: two humpback whales by north of Isle of Skye and up to four around Tiumpan head or Butt of Lewis. Two juvenile humpback whales were freed from entanglement in creel ropes earlier in the year near Skye (Rigell, 2025).

Humpback whales are well known to target overwintering herring in Norway, for example see (Brun, undated). In spring 2024, humpback whale sounds were recorded on an underwater hydrophone near Gairloch at herring spawning time (WOSHH, 2024 & 2025). Subsequently, in summer and early autumn 2024, humpback whales were often seen from wildlife tour boats to the northwest of Gairloch, including in the outer parts of the Wester Ross Marine Protected Area. They were seen feeding on krill. In August and during the autumn and early winter 2024 – 2025, humpback whales were seen near Applecross and in the sea between Wester Ross and Skye.

Our observations provide additional strong circumstantial evidence that pre-spawning herring may be targeted by humpback whales in the west of Scotland. What were the humpback whales around Lewis and to the north of Skye in February and March 2025 feeding on?

Minke whale

A minke whale was seen on 7th March to NW of Gairloch. Three minke whales were present close to a humpback whale on 9th March, coming to within about 1000m of the shore near North Erradale. All the whales remained in the same area for most of the day. Two minke whales were also reported from near Red Point (to the south of Loch Gairloch) on 9th March, suggesting at least five minke whales were in the area at the time. At least two minke whales were seen in the same area to the west of North Erradale on 14th March (SN pers. comm.). A minke whale was seen within 1km of the shore to the west of Opinan on 21st March, two minke whales were seen in outer Loch Gairloch on 23rd March, the same day that 'sandy coloured water' was reported in the sea nearby.

In April 2025, a minke whale was seen near Opinan or in Loch Gairloch in April on several occasions; this animal may have been feeding on sandeels.

Several minke whales overwintered in the west of Scotland in 2025, with three seen to the north of the Isle of Mull in January and several in February further north and around Skye (HWDT Sightings Map).

Dolphin sp. or spp.

Almost all the dolphins reported here were thought to have been common dolphins (*Delphinus delphis)* by their size and behaviour, with some animals jumping clear of the water fairly frequently. On 13th February 2025, dolphin groups totalling an estimated 100 or more animals were seen in the distance (5km or more offshore) from near Peterburn. A pod of an estimated 40 animals came at speed to within 2km of the shore between North Erradale and Peterburn on 8th March. However, the following day (9th March 2025) when there were whales, seals and porpoises in the same area, common dolphins were not noted as part of the aggregation of herring predators, though some were recorded near Opinan southwest of Gairloch at this time.

Porpoise

The first and largest group of porpoises was seen on 13th February; an estimated 60 animals to within 2km of the shore near Peterburn. On 9th March many porpoises (estimated at 30 animals) were seen surfacing where there was much activity from sea birds and whales. The porpoise count on 9th March may have been a bit too high; grey seals were behaving in a similar manner in the same area. Porpoises were seen on 20th March from the boat near Peterburn; they are harder to see from the shore than other cetaceans reported here and almost invisible from a distance when there is any wind ruffling the surface of the water.

On 25th February 2024, large pods of porpoises were seen to the west of North Erradale – Aultgrishan area, also assumed to be associated with herring shoals (Cunningham, 2024).

Grey seal

An estimated 20 grey seals were seen surfacing on 9th March to west of North Erradale, where there was much cetacean and seabird activity. These were hard to count from the shore; the number of seals in the area may have been larger. On 14th March, SN reported 50 seals seen around the survey boat in the same area. On 20th March up to 12 seals were counted on the surface around our survey boat in the same area; others may have been in the sea nearby, and there were always several seals nearby as we searched the seabed for herring eggs towards Aultgrishan.

Gannets and other sea birds

Gannets were seen from Opinan within 2km of the shore in February, with a count of 35 on 13th February. Gannets were first seen to north of Loch Gairloch on 17th February, with a count of ten gannets to west of Peterburn on 17th February.

The largest count was of an estimated 120 gannets on 9th March to the west of North Erradale and further north, to the west of Peterburn, at the time when there were many cetaceans including whales in the same area. On the same day, many gulls were also noted (estimated at 300+ gulls of several species – including many on nearby headlands) and 200+ shags to west and northwest of North Erradale, associated with all the sea mammal and gannet feeding activity. There were also divers in the sea nearby.

On 20th March, 40+ gannets were present in Loch Gairloch (not included in Table 1) seen from boat following egg survey expedition. On 23rd March, an estimated 60 gannets were present in outer Loch Gairloch (same area) where two minke whales were seen surfacing regularly. Smaller numbers of gannets were seen over subsequent days.

In early May 2025, 80 gannets were present in Loch Gairloch (on 5th May) possibly targeting bait balls of sandeels gathered up by guillemots and razorbills to near the surface of the sea (Cunningham, 2017).

Summary of wildlife sightings associated with herring in 2025

- Small numbers of dolphins and gannets were seen within 1000m of shore at Opinan in mid-February 2025, when winds were light and from the east (or SE or NE).
- There were few sightings of associated wildlife in late February and early March; when the sea was rough and viewing conditions were difficult.
- The biggest gathering of marine wildlife was seen on the 9th March to the west of North Errdale, with humpback whale, minke whale, porpoise, grey seal and many gannets present, to within about 1km of the shore. Dolphins were not noted in this feeding aggregation area on 9th March however they were seen here the day before.
- Minke whales were seen near Opinan on 21st March (to within 1km of shore) in Outer Loch Gariloch on 23rd March, together with 60 gannets. Herring eggs found on the seabed to the west of Opinan on 3rd April are assumed to be related to a spawning event around the 20th – 23rd March to west of Opinan which tallies with observations of minke whales at this time.

View to west from near North Erradale on 7th March 2025 over the area where many cetaceans were seen on 8th and 9th March 2025.

3. Satellite images: signs of spawning herring?

In 2024, likely signs of spawning herring can be seen on the Copernicus satellite photo on 10th March, the same day as a light-coloured area of water was seen from land associated with spawning herring, subsequently confirmed by finding eggs on the seabed (Cunningham, 2024).

Satellite images have been checked for possible signs of herring spawning in 2025. The following images (Figure 1) are from the Copernicus satellite images website .

Figure 1. Copernicus satellite photo of Peterburn to Melvaig area (NW of Gairloch), 30th March 2025. Note light coloured marks from headland NW of North Erradale and north to Melvaig and beyond, parallel with the coast.

Source https://browser.dataspace.copernicus.eu/?zoom=12&lat=57.81157&lng=-5.75752&themeId=DEFAULT-THEME&visualizationUrl=U2FsdGVkX1%2FpRCurMca5SWS6S75%2BcBSPRoXr9ixgUBUPE5Y5i5RVROYvhYSht9wYBgSpjvlnQUtvWH2Xz7mWSfhBxyGAM42BpeKFBY0Rhc8rTidiBJ%2BO%2BB5uNEHaZtkp&datasetId=S2_L2A_CDAS&fromTime=2025-03-30T00%3A00%3A00.000Z&toTime=2025-03-30T23%3A59%3A59.999Z&layerId=1_TRUE_COLOR&demSource3D=%22MAPZEN%22&cloudCoverage=30&dateMode=SINGLE

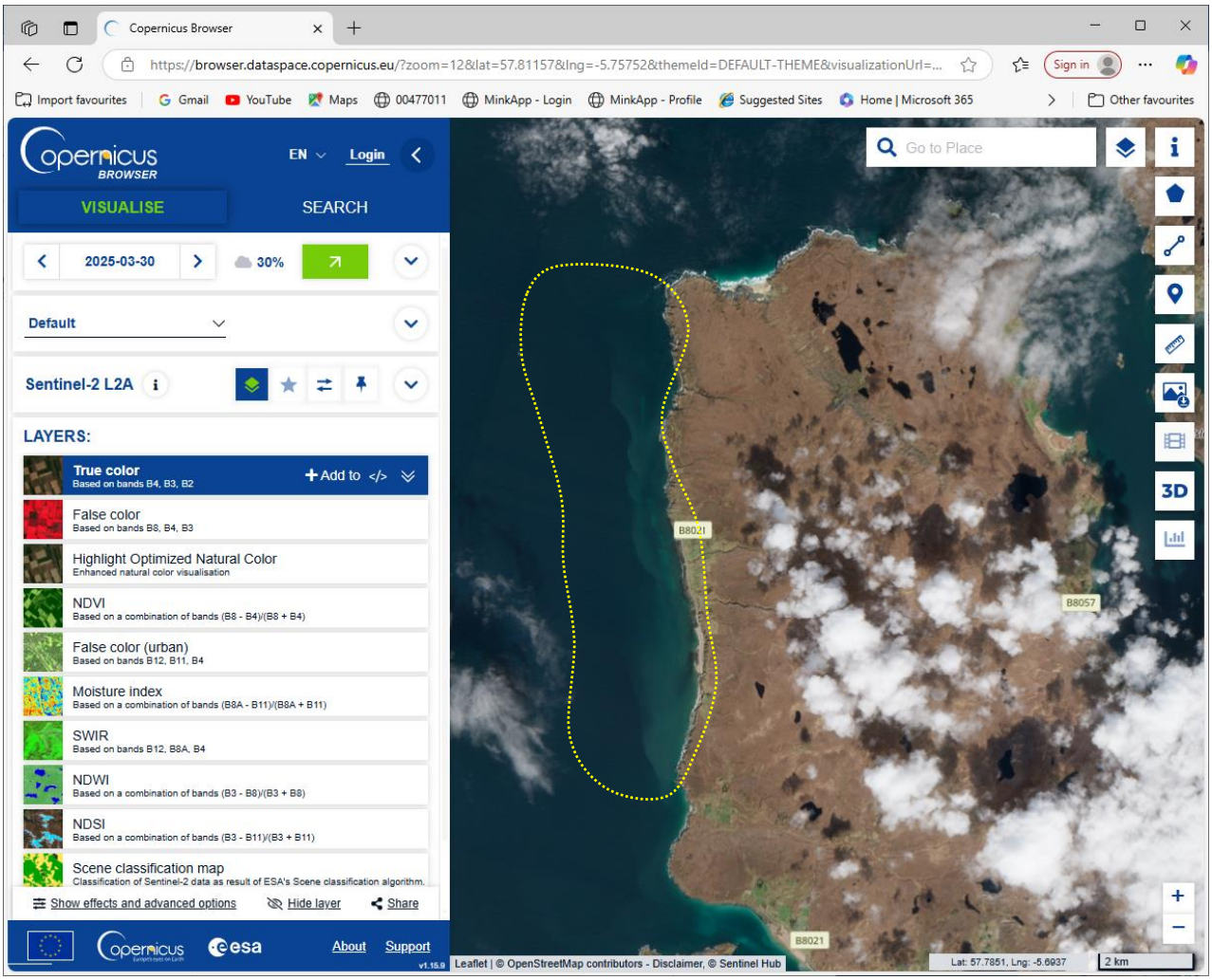
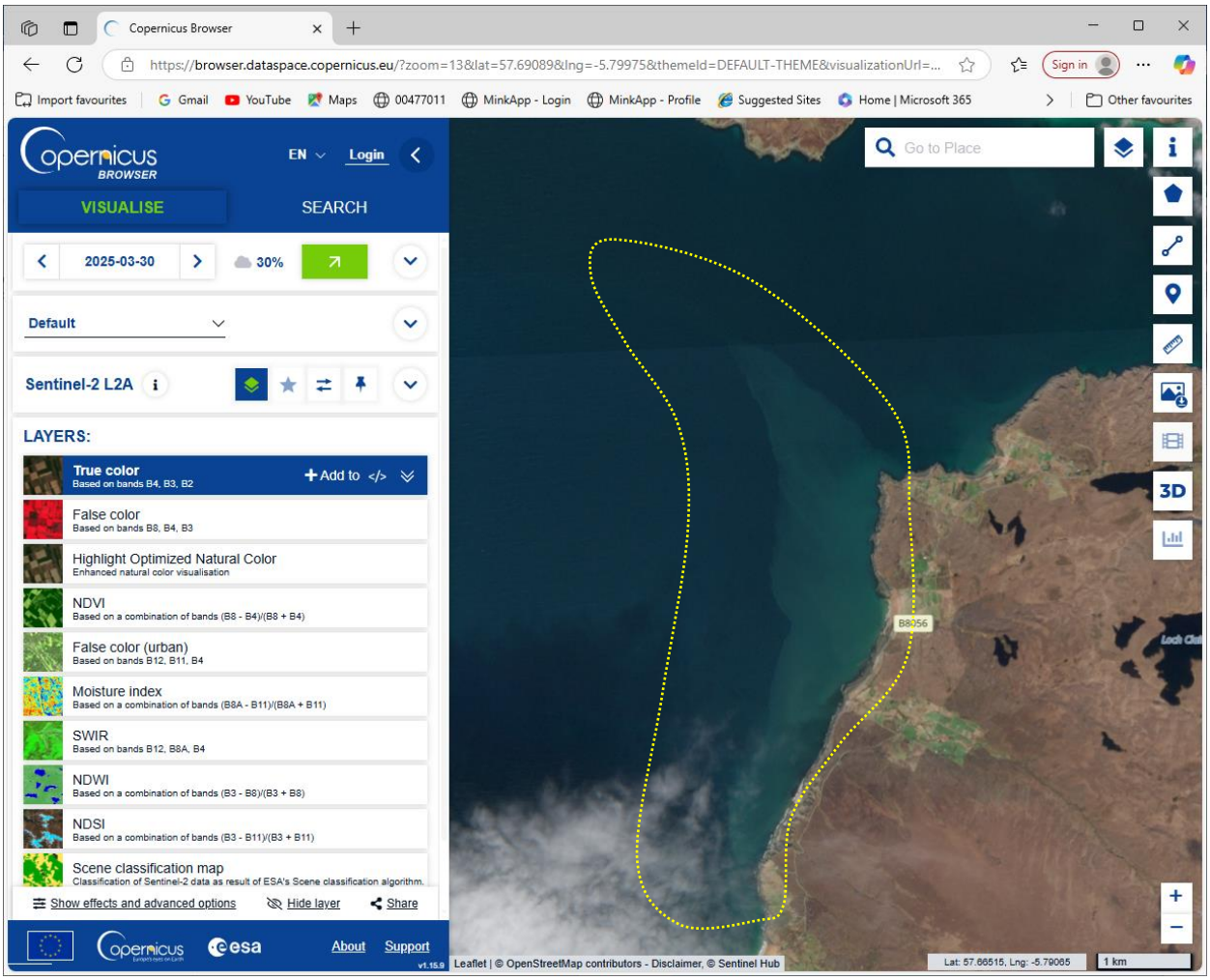


Figure 2. Copernicus satellite photo of Opinan area (SW of Gairloch), 30th March 2025. The light-coloured plume between Opinan and Carr Point roughly tallies with the area where herring eggs were found on the seabed and where high densities of hatching herring larvae were recorded from the survey boat on 3rd April 2025.

https://browser.dataspace.copernicus.eu/?zoom=13&lat=57.69089&lng=-5.79975&themeId=DEFAULT-THEME&visualizationUrl=U2FsdGVkX18eA4PRX8QI6DUYKUohxCOtAkkQqcgfE6bQ8f2%2FDR%2B7eL0AYuNOzVX72318MdQN0HSEHUy0%2BoUoqDQRNJz%2BRMPIKkYO24yWjdHzgO5Oa%2BkUhqY3NG5rJmXv&datasetId=S2_L2A_CDAS&fromTime=2025-03-30T00%3A00%3A00.000Z&toTime=2025-03-30T23%3A59%3A59.999Z&layerId=1_TRUE_COLOR&demSource3D=%22MAPZEN%22&cloudCoverage=30&dateMode=SINGLE



Are the light-coloured areas in these photos associated with spawning herring?

The images may show areas with high densities of herring larvae drifting away from spawning grounds rather than milt from spawning herring. When surveyed on 3rd April (four days after the photo was taken), many herring larvae were caught in plankton nets. Or is the lighter colour indicative of herring eggs on the seabed, or something unrelated to herring? Lighter coloured areas can be seen in some of the other satellite photos on same day in other parts of the west of Scotland.

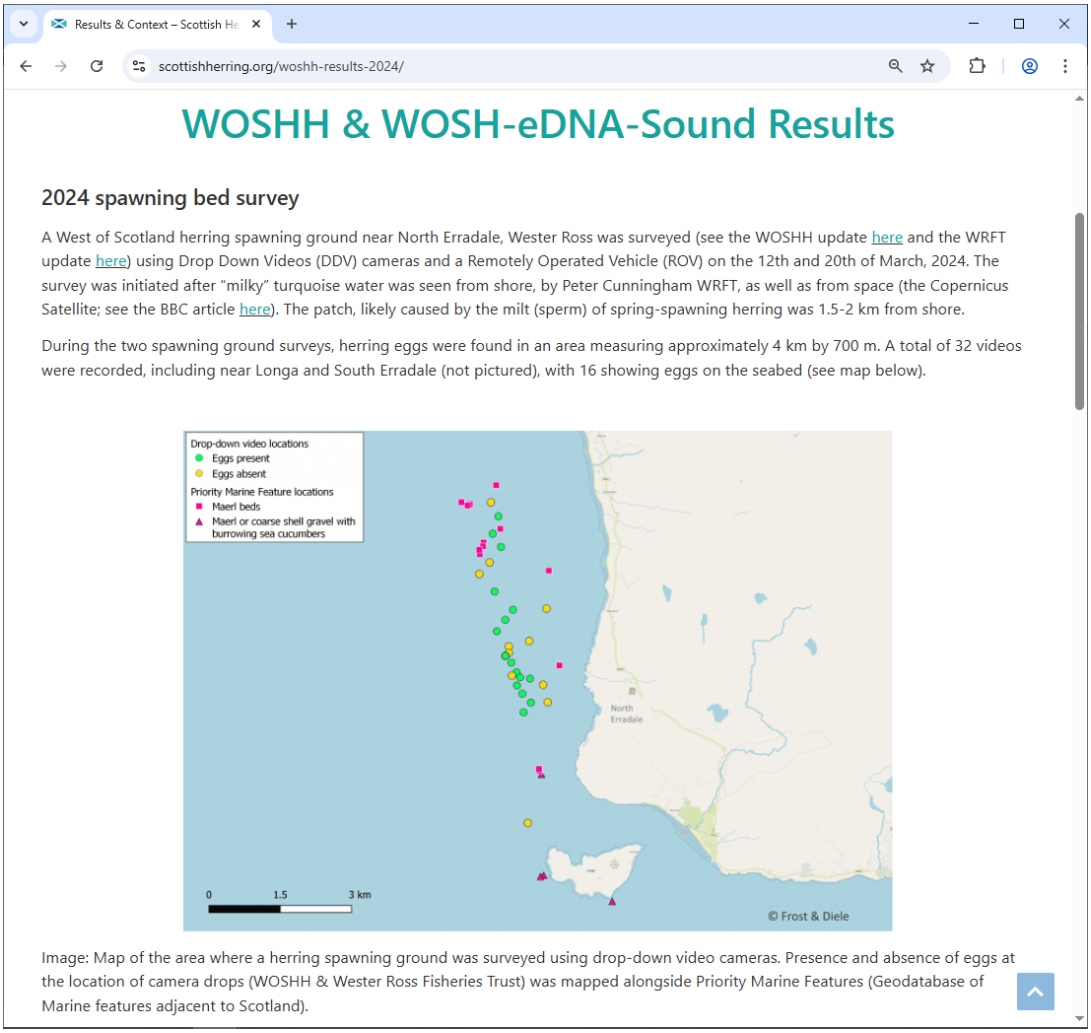
Summary of satellite imagery

- On satellite photos for 30th March 2025, light coloured areas can be seen in the sea tto the west of Opinan and northwest of North Erradale. The plume near Opinan area is consistent with where high densities of herring larvae were recorded on 3rd April 2025.

4. Herring egg surveys

In 2024, herring eggs were recorded on the seabed to the northwest of Gairloch, between North Erradale and Aultgrishan using the Little Loch Broom Marine Life group's ROV, and WOSHH and WRFT drop-down cameras. Figure 3 is the map of herring egg distribution from 2024 from data collected using drop-down video cameras (WOSHH, 2024).

Figure 3. Map of where herring eggs were found in 2024, note location of North Erradale. ©WOSHH Frost and Diele



In 2025, an initial herring egg survey was carried out on 20th March 2025, using drop-down cameras from the boat operated by Ian McWhinney with support from the West of Scotland Herring Hunt and WRFT. The seabed survey focussed on areas close to where much marine wildlife activity had been seen on 8th March and 9th March (described earlier) and where herring eggs were found on the seabed in 2024.

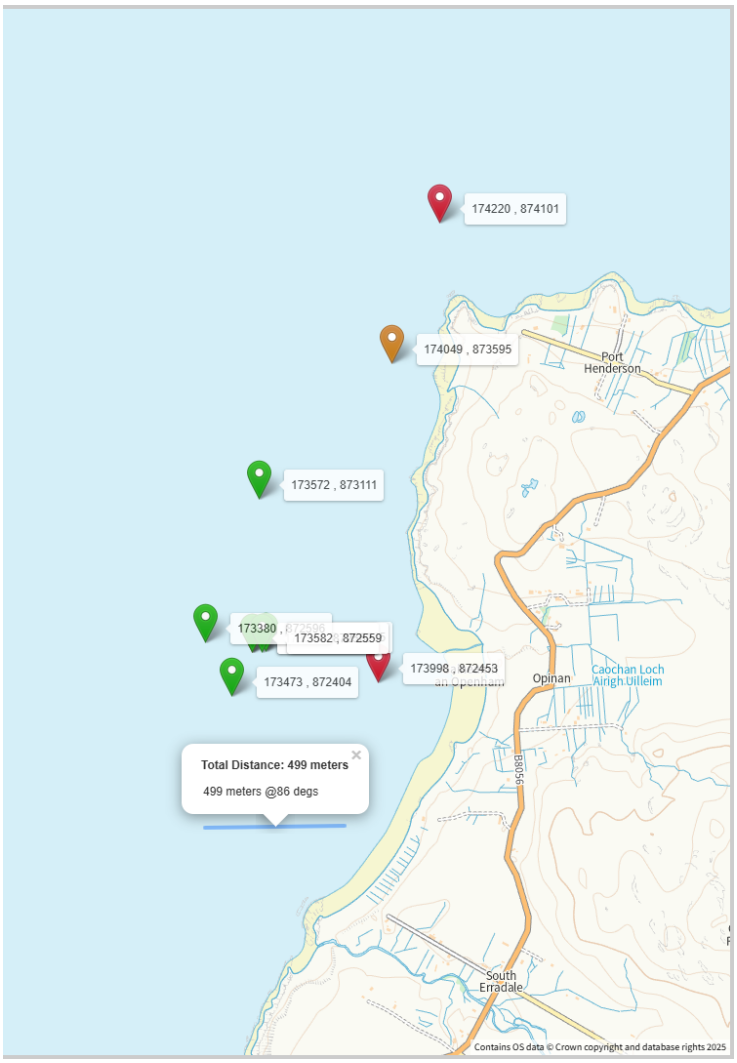
Over fifty camera drops were made. However, an initial examination of videos has been unable to confirm the occurrence of herring eggs. Eggs are certainly not present in any of the videos in the quantities seen in this area on the same date in 2024 (20th March), and subsequently seen to the south of Loch Gairloch near Opinan on 3rd April.

A second survey expedition on 3rd April 2025 followed sightings of many gannets and two minke whales in outer Loch Gairloch on the 23rd March and a report of 'sandy coloured water in the sea beyond Port Henderson' seen from the top of Sidhean Mor near Shieldaig.

This time, herring eggs were discovered on the seabed to the west of Opinan (SW of Gairloch) by the Little Loch Broom Marine Life ROV operated by Fiona (Fee) Mackenzie. The eggs were on clean maerl gravel and on sugar kelp fronds. Drop-down cameras operated by Nic Butler (Seabed and Seashore Loch Ewe) and Peter Cunningham (WRFT) also recorded video footage of herring eggs.

Figure 4 shows locations of where 'many' herring eggs were found (green markers); where 'just a few' eggs were found (orange marker); and one of many locations from Carr Point east to the Port Henderson area where no eggs can be seen in video images (not all shown).

Figure 4. Provisional map showing locations of where herring spawn found on the seabed on 3rd April 2025, note location of Opinan. From Grid Ref Finder website.



The eggs were found as a patchy layer on the maerl gravel seabed and on fronds of sugar kelp, in water from 10m deep to 15m deep. The following screenshots (Figure 5) are from videos taken by Opinan on 3rd April 2025. They were recorded by Nic Butler, using the Seabed and Seashore Loch Ewe drop-down GoPro Hero12 camera and Fiona (Fee) Mackenzie, using the Little Loch Broom Marine Life Chasing ROV. Herring eggs were found in the same area in 2018 and 2019.

The herring spawn survey expedition on 3rd April 2025 was funded and supported in-kind by members of the local community. It was not possible to map out the extent of the herring spawning ground in 2025; our records may be of just a corner of a much larger herring spawning ground.

Figure 5. Video still screenshots of herring eggs on the seabed to the west of Opinan, 3rd April 2025.

A. Drop down GoPro12 Camera operated by Nic Butler

(a) Christian Gudgeon holding the clapper board ©Seabed and Seashore Loch Ewe

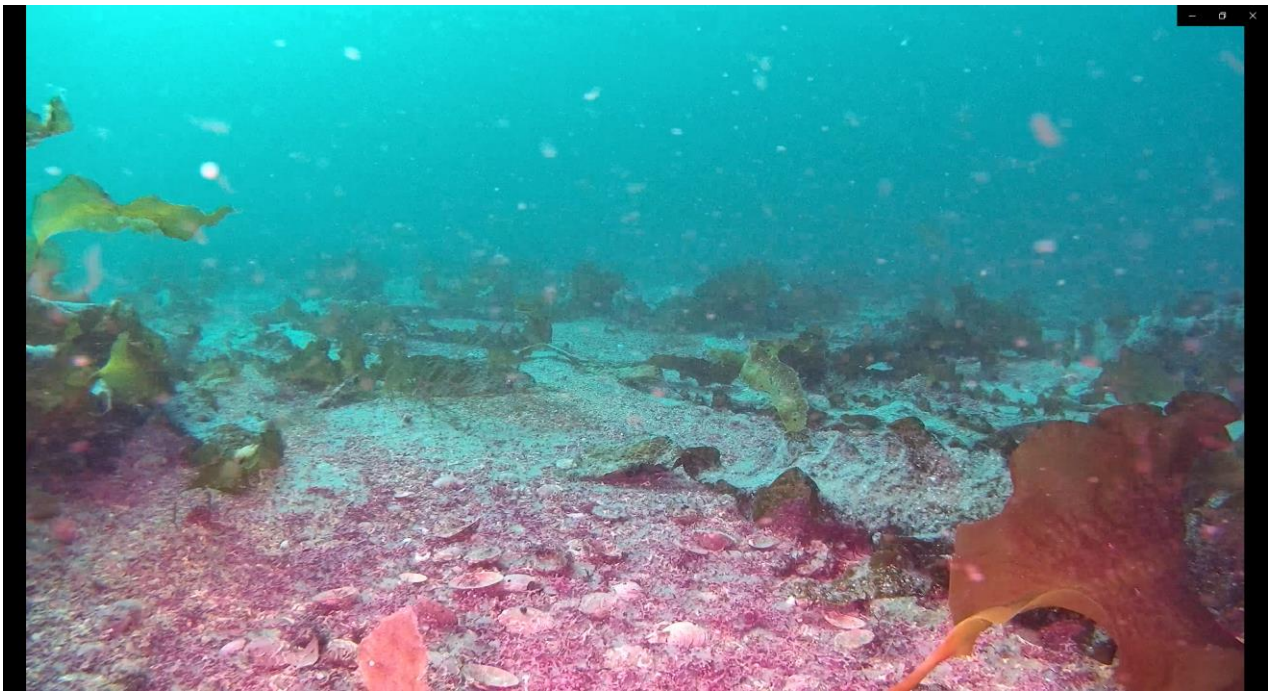
(b) Eggs can be seen on some of the kelp fronds and on the gravelly seabed to the right of the picture. Note how some areas have been swept clear of eggs by the kelp fronds sweeping the seabed associated with wave action during period when winds were strong. ©Seabed and Seashore Loch Ewe

(c) Eggs adhering to kelp fronds and to maerl gravel on the seabed; in some areas, eggs have been swept and jumbled up, possibly as a result of wave action. ©Seabed and Seashore Loch Ewe

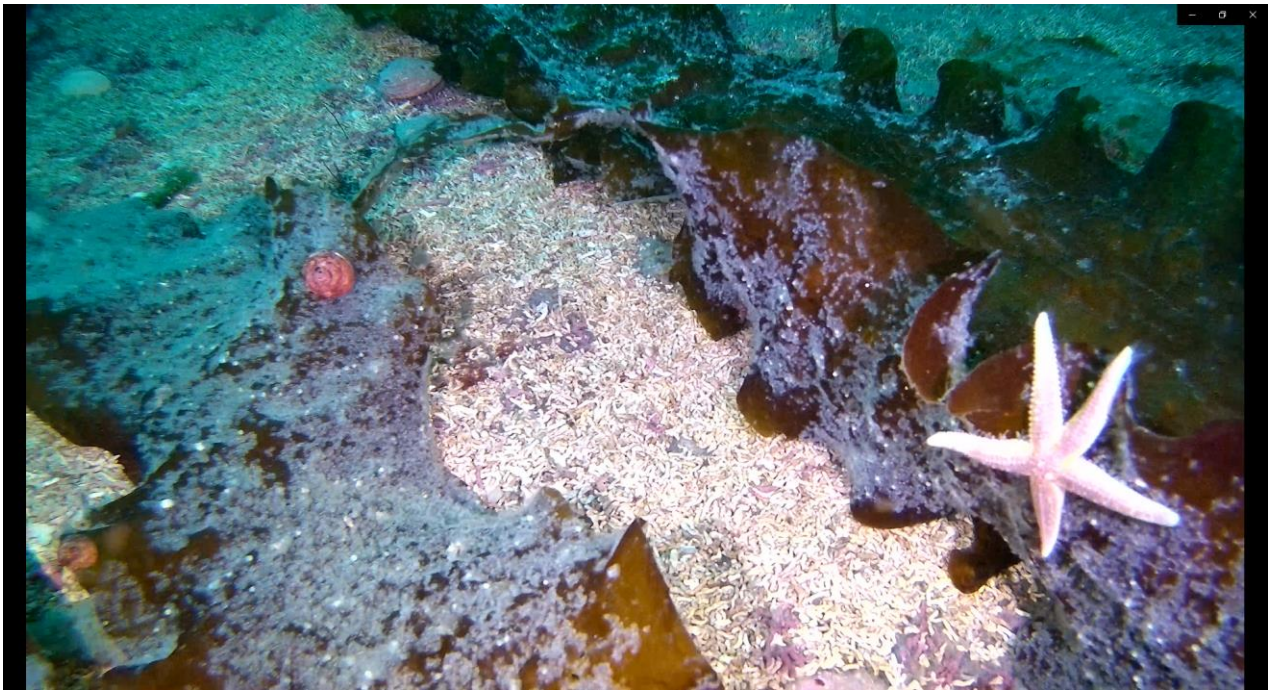
(d) Mostly jumbled live maerl with herring eggs mixed in. Note common starfish. ©Seabed and Seashore Loch Ewe

B. Video stills from Little Loch Broom Marine Life Chasing ROV operated by Fee Mackenzie

(f). FM10, 10m depth. Herring eggs on kelp fronds and in clumpy patches on the maerl and shell gravel seabed. ©Little Loch Broom Marine Life Surveys.

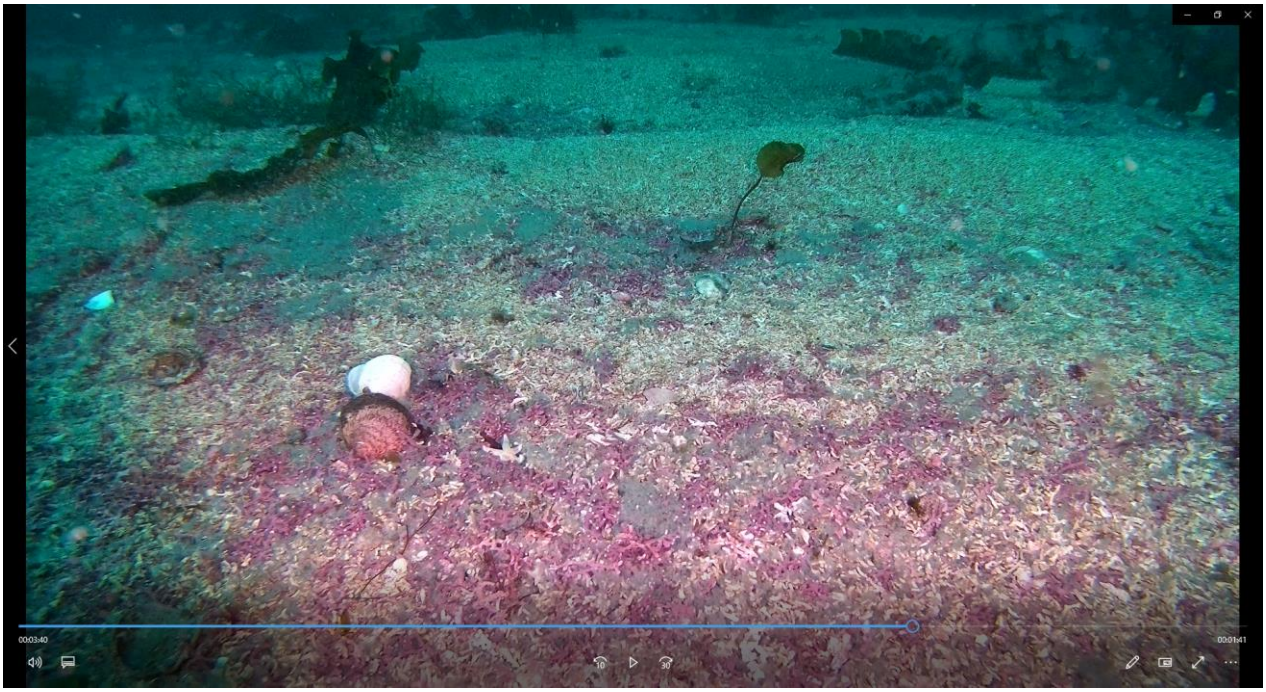


(g) Eggs on kelp fronds. The white specs on the fronds are assumed to be dead eggs; all the others are assumed to be alive. Note starfish and topshell. ©Little Loch Broom Marine Life Surveys

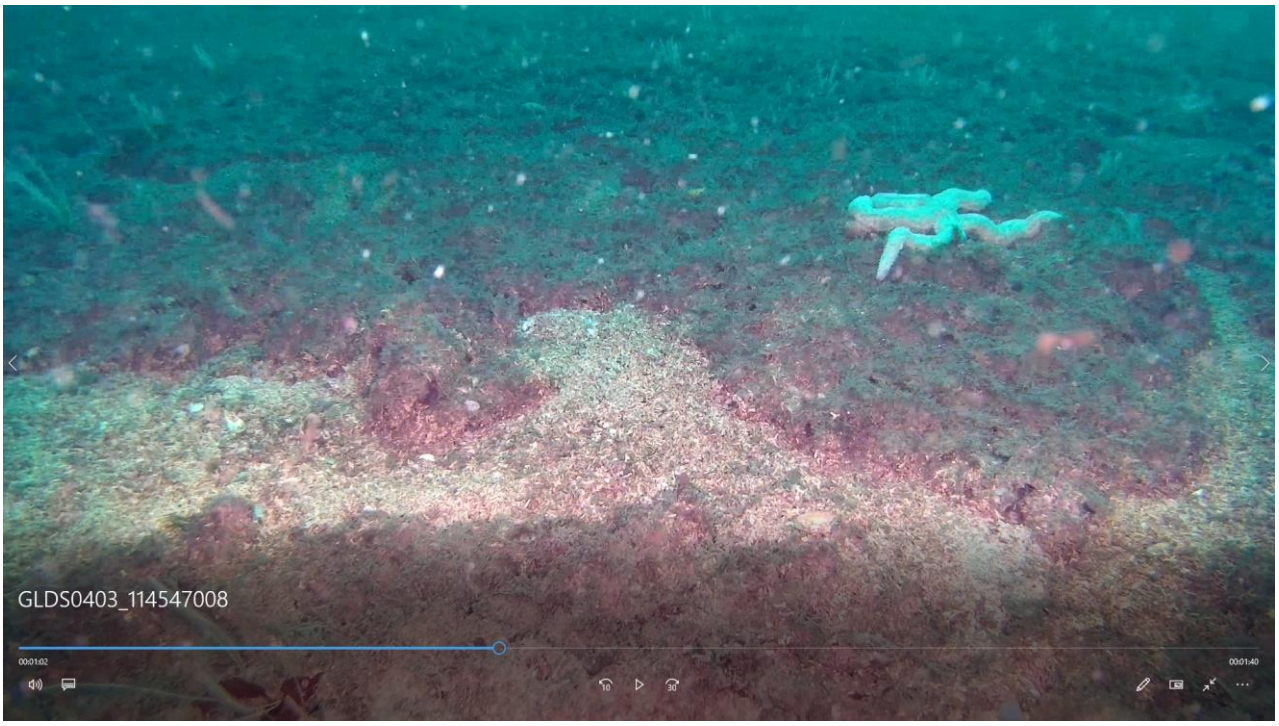


(h) Live maerl and seashells with jumbled herring eggs mixed in, swept up by the sugar kelp fronds (?) ©Little Loch Broom Marine Life Surveys

(i) Live maerl and seashells with jumbled herring eggs mixed in ©Little Loch Broom Marine Life Surveys.

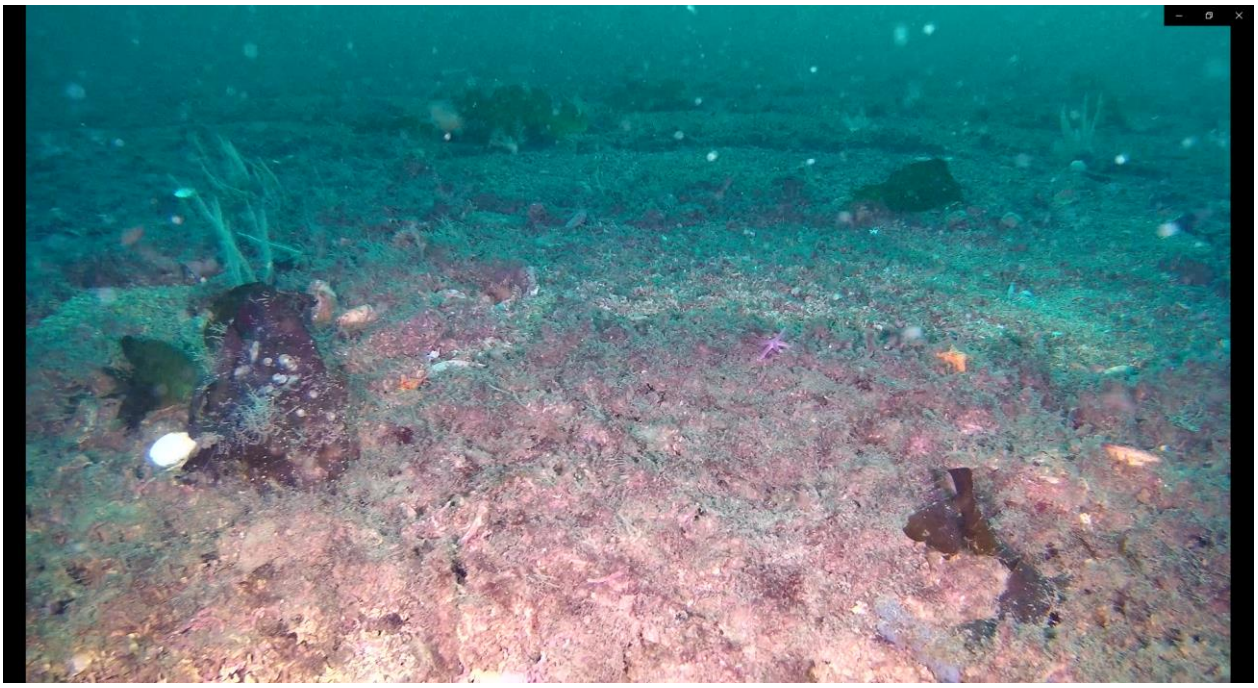


(j) FM9, 14m depth. Dark areas amongst maerl are thought to be of hatching herring eggs. Note the large starfish. Is it feeding on eggs? ©Little Loch Broom Marine Life Surveys

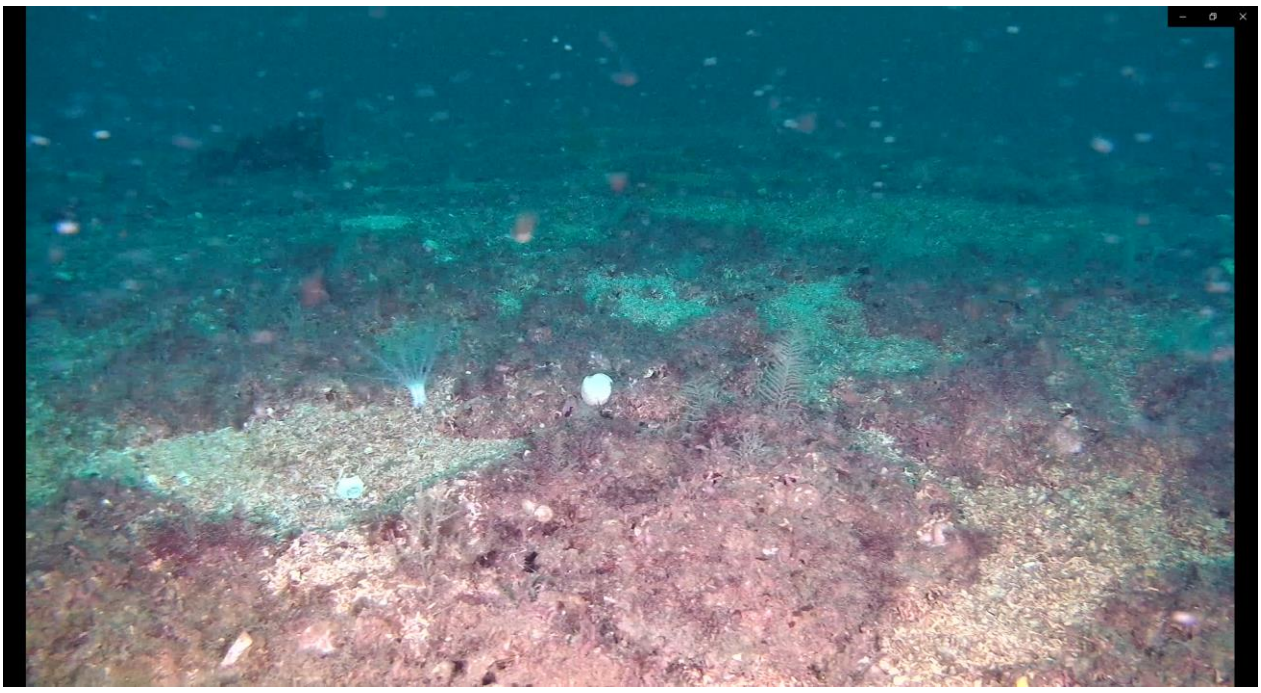


(k) FM9, 14m depth. Dark areas amongst maerl are thought to be of hatching herring eggs. Note the live scallop ©Little Loch Broom Marine Life Surveys

(l) FM9, 14m depth. The upright white things are thought to be hydroids (?) ©Little Loch Broom Marine Life Surveys



(m) FM9, 14m depth. Note burrowing sea cucumber and hydroids. The light-coloured particles in the water column above seabed include many herring larvae. ©Little Loch Broom Marine Life Surveys

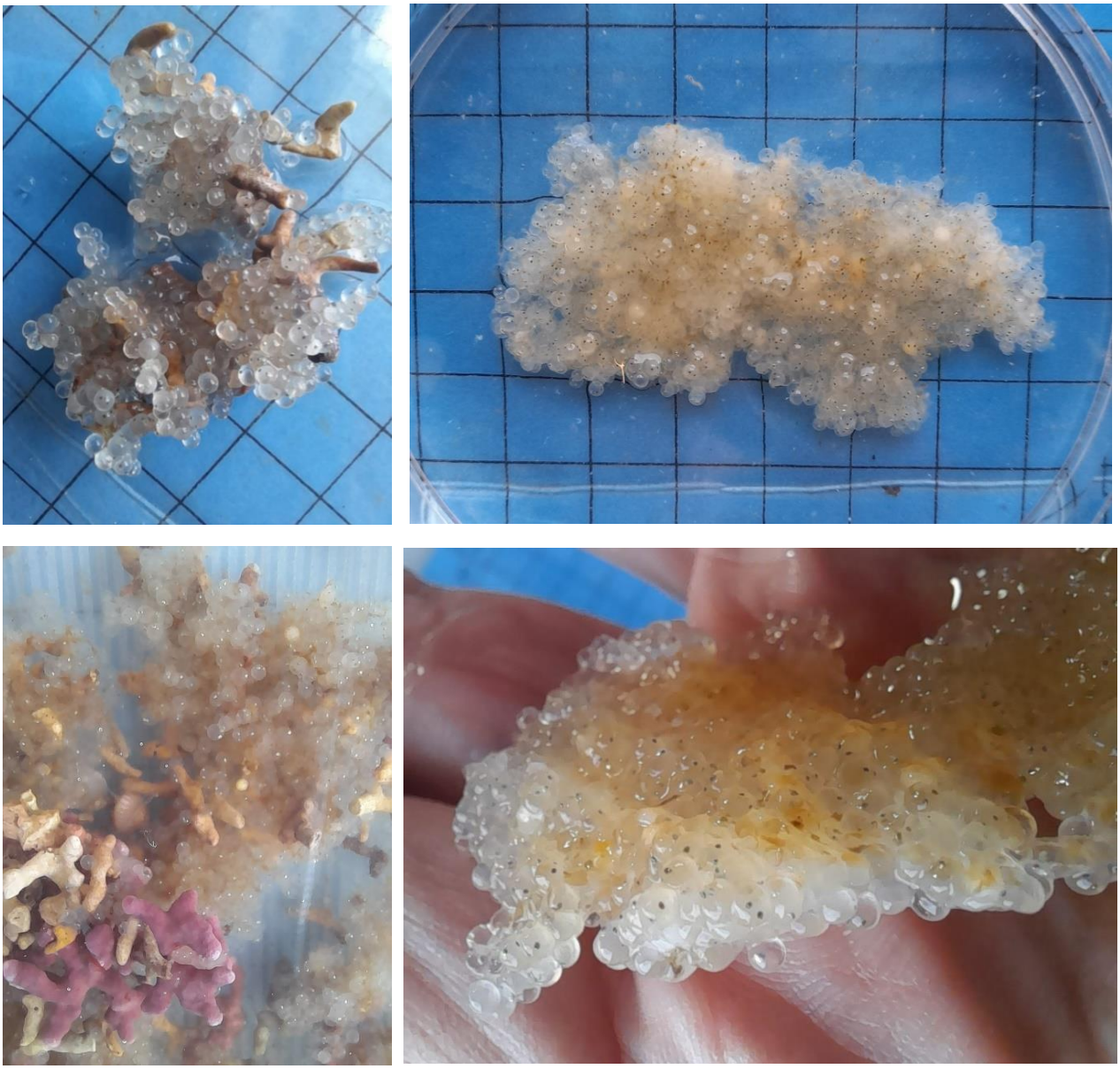


Herring egg sample collection

Herring eggs were collected from the spawning area by Opinan on 4th April 2025 by divers Sara Nason and Rob McKean supported by James Cameron, following the discovery of herring eggs the day before. Small samples of eggs were taken from both maerl gravel and from sugar kelp fronds. The egg layer was up to roughly 6 eggs thick, with eggs forming a robust cohesive patchy 'rug'. Eyes can be seen in many of the eggs.

Figure 6 is of samples of the eggs taken from sugar kelp and from the maerly gravel. Nearly all the eggs, including those jumbled up in maerly gravel, were eyed and appeared still alive when examined in the WRFT office, roughly four hours after collection from the seabed.

Figure 6. Samples of herring eggs collected on 4th April from the seabed near Opinan. Eggs were collected by Sara Nason (Blue Hope Alliance) and Rob McKean with support from James Cameron. Photos by Peter Cunningham (WRFT)



Samples of herring larvae

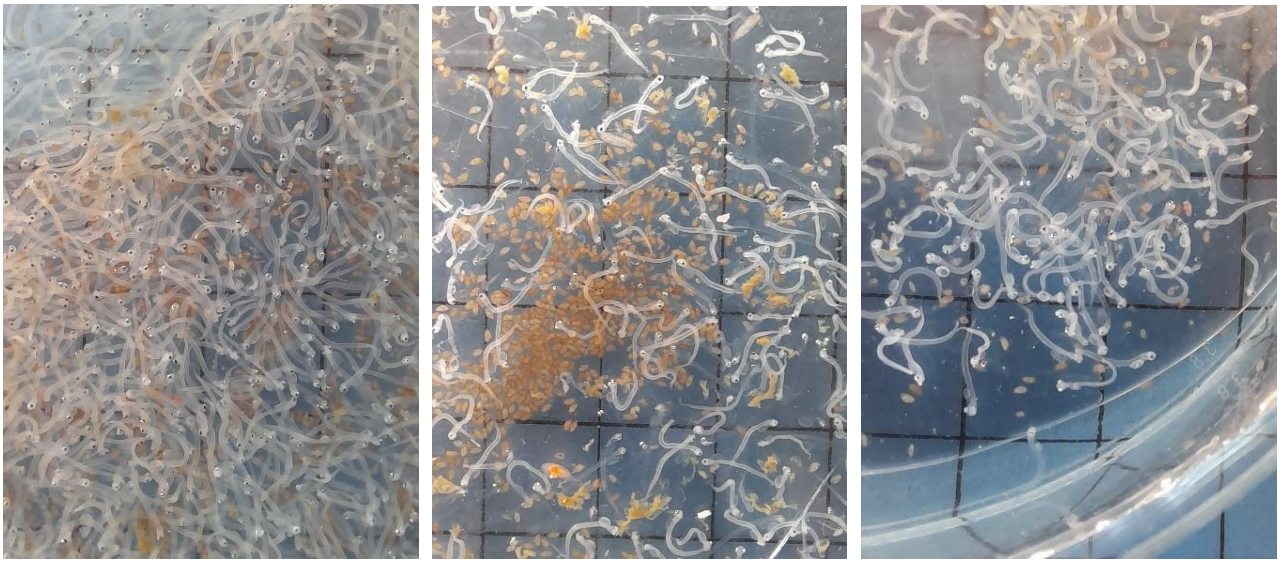
Small numbers of fish larvae, thought to be herring, were taken using a plankton net (Ø30cm mouth and 250µm filter) during the expedition on 20th March to north west of Loch Gairloch, indicating that there had been some spawning of herring probably somewhere nearby in early March (Figure 7). The net was thrown from the boat to the end of the string and pulled back through the water to the boat; the total distance trawled per sample was about 8m to 16m (sometimes two throws per sample).

Figure 7. Fish larvae, thought to be herring, from a 250µm plankton net sample taken from near Peterburn on 20th March 2025.

Much larger samples of fish larvae assumed to be those of herring were taken using the 250µm plankton net on 3rd April 2025, with the highest densities recorded to the west of Opinan close to (often directly above) locations where high densities of herring eggs can be seen on the seabed in videos (Figure 8).

Some of the herring larvae were retained for genetic studies.

Figure 8. Herring larvae and other zooplankton collected 250µm plankton net on 3rd April 2025 near Opinan (SW of Gairloch). Grid squares are 10mm. Photos by Peter Cunningham (WRFT)



Summary of the main findings from the herring egg and larval herring survey

- Herring eggs were recorded on the seabed between 500m and 1000m from the shore to the west of Opinan, Wester Ross, on 3rd April 2025.
- Water depths where eggs were found were from 10m to 14m.
- Eggs formed patchy 'rugs' which adhered to sugar kelp fronds and covered parts of the clean maerl gravel seabed. Eggs were present in areas with much clean live maerl.
- In some places, the eggs on the seabed appeared as a jumbled mix with eggs and maerl sticking together. Nearby kelp fronds may have swept up some of the eggs, during periods of strong winds and big waves between 23rd March and 3rd April 2025.
- Egg samples collected from the seabed on 4th April 2025 demonstrated that most of the eggs on both the kelp fronds and on the jumbled maerl gravel were eyed and still alive.
- The highest densities of larval herring were found on 3rd April 2025 very close to where many herring eggs were recorded on the seabed by drop-down cameras.
- An earlier survey expedition for herring eggs on 20th March to the northwest of Gairloch comprised over 50 successful drops to the sea bed with video cameras. No herring eggs have been identified in any of the video images. There is uncertainty regarding interpretation of the 'dirty' colouration of some of the maerl gravel on the seabed in some of these videos.
- However, fish larvae thought to be herring were collected using a plankton net on 20th March 2025, near Peterburn and Aultgrishan.

Herring egg survey teams on 20th March 2025 (above) and 3rd April 2025 (right)

5. Discussion and conclusions

Herring spawned to the southwest of Gairloch in March 2025. Approaching shoals attracted much marine wildlife including whales; a marine wildlife spectacle.

Sightings of herring shoals included up to four whales in the same area on 9th March 2025 (a humpback and three minke whales), grey seals, porpoises and many sea birds. Some local observers were able to witness sightings of a humpback whale for the first time, partly thanks to being able to quickly report observations on a local wildlife sightings facebook page.

In terms of estimated biomass, the aggregation of fish predators represents one of the biggest documented springtime gatherings of marine wildlife witnessed near Gairloch in recent years, especially if an estimated biomass for herring is included. In late February 2018, there were estimated to be herring shoals totalling 3000 to 4000 tonnes of herring in this area (see Cunningham 2018).

Observations demonstrate the seasonal importance of herring as a source of food for marine wildlife. Rough estimates for daily food intakes of observed wildlife based on information on-line (various sources via google) are as follows: 1 humpback whale, 1000kg/day; 3 minke whales, 600kg/day [3 x 200kg/day]); 40 grey seals, 600kg/day [40 x 15kg/day]; 20 porpoises, 100kg/day [20 x 5kg/day]; 100 gannets, 25kg/day [100 x 0.25kg/day]; other sea birds, 50kg day. The foregoing figures simply aim to illustrate how predator pressure from a few large whales on herring shoals may have been greater than from all the other predators combined; but also, that if the combined herring shoals were as big as in 2018, the total amount of herring consumed by predators would be no more than around 3000kg/day or 0.1% of a spawning herring biomass of 3000 tonnes of herring (if similar adult herring abundance as in 2018) per day.

No herring eggs were found on 20th March 2025 on the seabed in the area where much wildlife activity had been seen on 9th March. The drop-down camera survey that day included many drops close to where herring eggs were found on the seabed on 20th March 2024. It was therefore a surprise not to find herring eggs on 20th March 2025. Some of the maerl gravel looked 'dirty' in the videos recorded on 20th March 2025. Is it possible that residues of hatched eggs (from 2024) or dead eggs were present in some images or perhaps eggs jumbled up with mobile sediment? Or was there too much excrement from sea mammals or other fine sediment or algal deposits?

Following observations of many gannets and two minke whales in outer Loch Gairloch and of 'sandy coloured water' nearby on 23rd March 2025, a second seabed survey expedition was organised on 3rd April 2025 to search for herring eggs. The survey explored the seabed to the southwest of Loch Gairloch. This time thick patches of cohesive herring eggs were recorded, with eggs forming a 'carpet' or patchy 'rugs' over the maerl gravel seabed and adhering to sugar kelp fronds.

Some of the eggs appeared to have been gathered into clumps and mixed with maerl gravel. Winds were strong and seas were high on some days between 23rd March and 3rd April 2025; maerl gravel on the seabed may have been mobilised. However, most herring eggs collected on 4th April 2025 from the same location, both amongst maerl gravel and on kelp fronds, were found to be alive, despite evidence of disturbance on the seabed.

The presence on 3rd April 2025 of both herring eggs on the seabed and herring larvae, suggests that herring spawned over several days in mid-March 2025, particularly around 20th to 23rd March. Herring may spawn in multiple waves over several weeks (Frost, 2022). There may have been some spawning or at least movement of herring shoals into shallow water near Opinan from as early as mid-February, based on observations of marine wildlife seen nearby by RW and SW.

The Copernicus satellite images of 30th March 2025 are of interest. If they show herring larvae drifting away from spawning areas in the water column (one possibility?), then perhaps herring spawned to northwest of Gairloch after all, perhaps in water shallower and closer to the shore than where we looked on 20th March 2025 and / or after our survey on 20th March 2025? Herring spawning may be delayed, or shoals may move to different areas to spawn according pressure from marine predators (Frost, 2022).

The occurrence of eggs on both sugar kelp fronds amongst maerl gravel is of interest. A sample of herring eggs collected from a sugar kelp frond on 4th April 2025 by Sara Nason was of live eyed eggs, not far off hatching. Eyes develop on eggs five to seven days after spawning (various sources).

Herring eggs were recorded on the seabed in shallower water in 2025 (10m to 15m depth) than in 2024 (mostly 20m to 25m depth) and at a later date in 2025 (3rd April) than in 2024 (12th March; 20th March).

A delay in the time of spawning can be associated with high predator pressure (more predators were seen than in 2024), and/or unsuitable weather and sea conditions (Neervoort, 2013; Frost, 2022).

The sea water in early March 2025 may have been slightly cooler than at same time of year in 2024 (Figure 9).

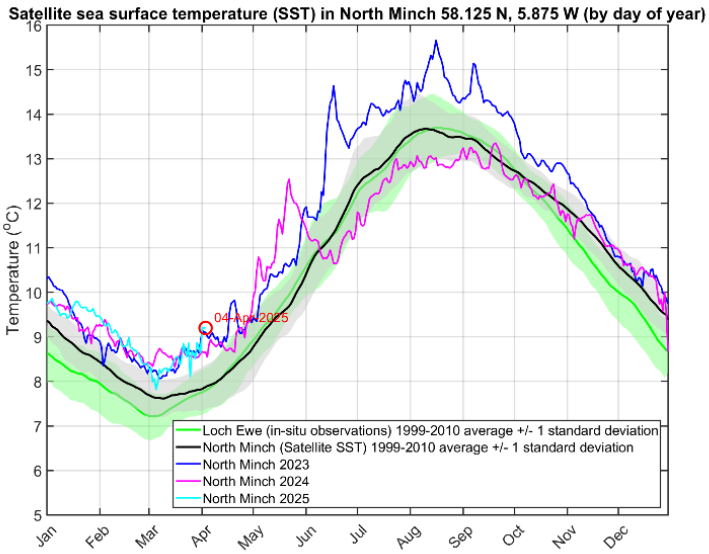


Figure 9 North Minch Sea temperatures 2023 - March 2025. Thank you to Keith Dunbar and Sam Jones, Scottish Association of Marine Science for forwarding this graph.

Another suggestion is that herring may prefer to spawn around new moon when it is darkest at night. In 2024, the new moon was on 10th March, close to the envisaged peak spawning time. However, in 2025 new moons were on 28th February and 29th March; this is no evidence of herring spawning around then.

Available funding and in-kind support did not permit a full survey of the Opinan herring spawning ground in 2025; many questions remain unanswered.

Local fishermen's anecdotes suggest that 2025 was a 'bumper year' for adult herring moving inshore by Wester Ross to spawn in the late winter and early spring. There were various undocumented reports of captures of maturing herring in prawn creels and prawn trawls by locally based boats around Wester Ross in February and early March 2024.

Much additional information could be gathered from local fishermen relating to the timing and locations of herring spawning and of the movements and size of herring shoals prior to spawning. However, additional incentives may be needed for fishermen to be able to report all captures of maturing herring as they move inshore towards potential spawning grounds in the winter and early spring.

The need to accommodate and to foster greater local interest in herring needs to be balanced against the need to protect herring stocks from unregulated fishing effort. Given the importance of herring (juvenile and adults) as a resource of importance to marine wildlife, fisheries managers need to work together with wildlife conservation interests and local people.

Acknowledgements

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Spawning herring surveys in 2025 were supported by members of the local community and / including:

Watching marine mammals and birds aggregation to west of North Erradale on 9th March 2025

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