Applecross wild fish monitoring report 2025

to inform Loch Ainort, Caol Mor & Inner Sound EMP

for MOWI Scotland Ltd., Wester Ross Area District Salmon Fisheries Board, The Scottish Government (in place of the Skye District Salmon Fisheries Board) and The Highland Council

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Applecross sea trout and salmon monitoring report for Loch Ainort, Caol Mor & Inner Sound EMP for 2025

Peter Cunningham, December 2025

Summary

This document presents the results of wild fish monitoring activities at Applecross during the spring, summer and early autumn of 2025 as part of the Environment Management Plan [EMP] for MOWI salmon farms in Loch Ainort, Caol Mor and the Inner Sound.

Seine netting teams were assembled to sample sea trout in the mouth of the Applecross River in June, August and September 2025. Overall, 67 sea trout were recorded with counts of sea lice taken. All fish were returned following a period of recovery from mild sedation.

Lice counts were high on sea trout sampled in June (30 fish, average of 0.28 lice per gram of fish weight), indicative of high sea lice infestation pressure in coastal waters nearby during preceding weeks. Some of the fish taken in the August sample (24 fish) also carried high numbers of sea lice.

The September sample was of mostly of smaller trout, including some that looked like estuarine trout which may not have ventured far into the sea. The two largest trout in this sample had dorsal fin damage associated with earlier sea lice infestation.

Reference to reported sea lice levels and on-farm biomass figures for the nearest salmon farms in the East of Skye and in Loch Kishorn can help with interpretation of potential sources of lice. As in 2023, there are several possible sources of infective larval sea lice that could have infested the sea trout that were sampled at Applecross including farms in the East of Skye and in the Loch Carron – Kishorn area.

As in 2023, concern need to be expressed for the survival of post-smolt salmon migrating through coastal waters near Applecross from rivers further south, including those from the rivers Carron, Ling, Elchaig, Croe, Shiel and Glenelg rivers in spring and early summer 2025.

The 2024 reported rod catch of salmon for the River Carron was the lowest on record for over 20 years. This may relate to very low numbers of adult salmon returning to the River Carron in 2024, and very low levels of survival of post-smolt salmon as they migrated through nearby coastal waters when sea lice infestation pressures were very high in 2023 and earlier years.

During periods when nearby salmon farms are in operation, all salmon farms in the area need to work together more effectively to coordinate production cycles and / or sea lice treatments, to reduce the likelihood of cross infestation of sea lice from one farm to another farm, and infestation of wild fish.

1. Introduction and background

1.1 Location and rational

The Loch Ainort, Caol Mor and the Inner Sound EMP covers an area to the Isle of Skye and around the island of Scalpay (production area M-28) as shown in Figure 1.

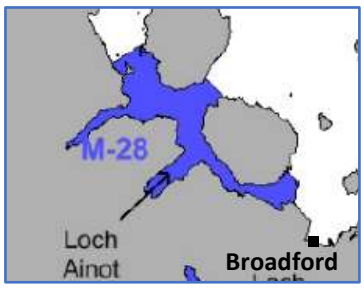


Figure 1. Location of M-28 farm salmon production area.

This area has 5 licenced salmon farms, all operated by MOWI; these are shown in Figure 2.

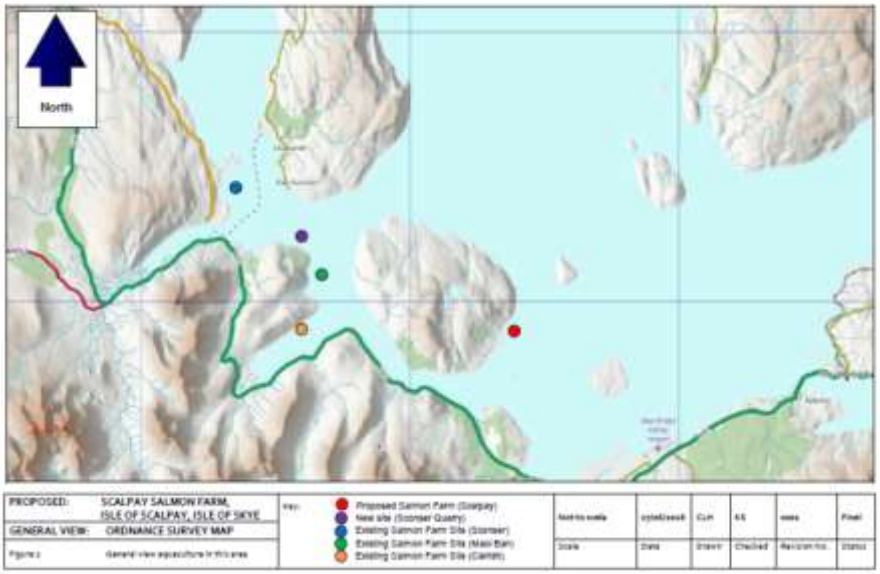


Figure 2, locations of MOWI salmon farms within the area covered by the Loch Ainort, Caol Mor and the Inner Sound. This map is taken from the EMP document.

Following development of the MOWI Scalpay farm, it was agreed that in addition to wild fish monitoring of sites by the Isle of Skye, wild fish should be monitored at Applecross on the mainland.

This was following projections from the sea lice dispersal model submitted by MOWI, in support of the planning application for the Scalpay salmon farm, that the waters around Applecross would be an area where infective stage sea lice could be expected to be present in highest densities within the sea (Figure 3).

This current report describes activities carried out to monitor wild fish at Applecross in 2025.

Figure 3. Reproduced from Figure 1 from Gillibrand (2019) Modelling the Dispersal of Sea Lice Larvae from Scalpay Salmon Farm. MOWI Scotland Ltd. Note the location of the modelled sea lice 'hotspot', just 5km to the west of Applecross, shown thus: ■ **A**.

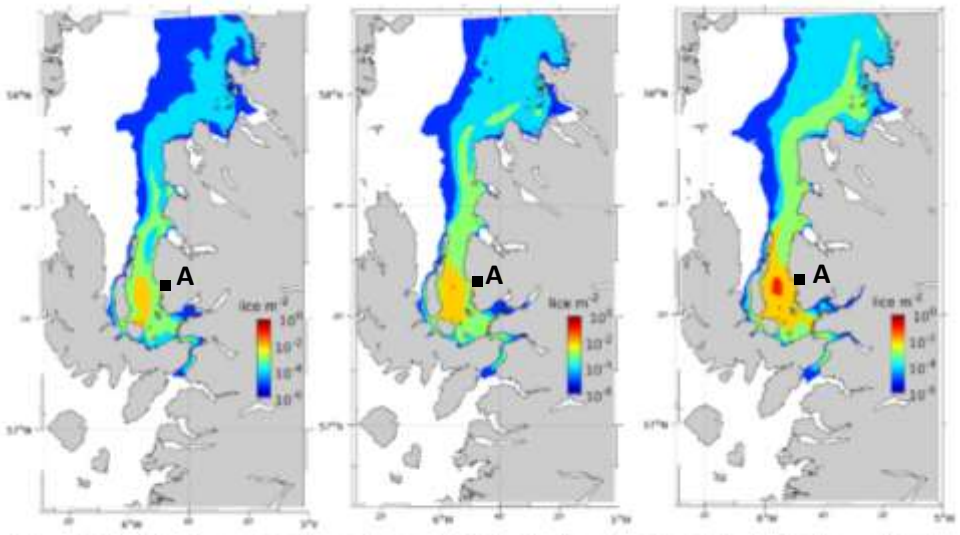


Figure 1. Predicted mean lice density (lice m^{-2}) for April – June from Simulation 1 (Scalpay only) with average adult female lice count of 0.2 (left), 0.5 (middle) and 1.0 (right). Note that the colour scale is logarithmic, indicating orders of magnitude of density, with a highest value of 1 copepodid per m^2.

1.2 Monitoring lice infestation on wild salmonids for Loch Ainort, Caol Mor and the Inner Sound EMP

The EMP states that 'The key element of the monitoring strategy will be a programme of wild fish monitoring to measure levels of sea lice infection pressure on wild salmonids in coastal waters. The monitoring programme should be designed to detect the potential effect (if any) of aquaculture on the local wild fisheries within a zone of 30 kilometres from the Management Area.'

'Given the relative lack of knowledge of the distribution of migrating salmon smolts in coastal waters, it is recognised that the monitoring programme should be designed with the focus on the sampling of juvenile sea trout as a surrogate means of assessing sea lice infestation pressure.'

There are four wild fish monitoring sites for wild fish for the purposes of informing the Loch Ainort, Caol Mor and the Inner Sound EMP. These are listed in Table 1.

Table 1 Monitoring sites for wild fish within the Loch Ainort, Caol Mor and the Inner Sound EMP area.

Freshwater Catchment	Marine Loch	Trust area
River Sligachan	Loch Slapin	S&LRT
River Snizort	Loch Snizort	S&LRT
River Strath Mor	Loch Sligachan	S&LRT
Applecross River	Inner Sound	Wester Ross FT

In 2022, for the purposes of informing the EMP, MOWI commissioned WRFT to sample sea trout in the Applecross River estuary area to gain data to complement that collected by Skye and Lochalsh River Trust by the Isle of Skye.

2. Monitoring sea trout at Applecross

2.1 Previous wild fish monitoring at Applecross

In 2022, the WRFT sea trout monitoring team visited Applecross on four occasions to sample sea trout for the EMP. Altogether, only 16 trout were recorded from which sea lice data was obtained. Only two of these were caught using the seine net in the sea or in sea pools of the river; the other 14 were caught from the sea pools using rod and line by anglers using a small size 12 teal and blue fly with crimped barb. A report was prepared (Cunningham, 2022a) in which the challenges of obtaining sea trout samples in 2022 are discussed and results are presented.

In 2023, the WRFT sweep netting team organised five visits to Applecross to sample sea trout, catching sea trout on four out of five occasions in the sea pool of the Applecross River, with a total of 140 sea trout caught (Table 2). Lice levels were very high on sea trout of over 200mm length sampled in May (average 138 lice per fish; 0.43 lice per gram of fish) and high in June (average 34 lice per fish; 0.27 lice per gram of fish). Lice levels were much lower on most fish in samples taken in July and August 2023 (averages of 0.09 and 0.07 lice per gram of fish respectively). All the lice recorded in May 2023, and nearly all recorded in June 2023 were small chalimus stage lice, indicative of recent attachment.

In 2024, the WRFT sea trout sampling team organised four visits to Applecross and was again successful in obtaining large samples of sea trout at Applecross. In May and June 2024, burdens of small early-stage chalimus sea lice were lower than at the same time of year in 2023 (averages of just 6.51 lice per fish in June sample). However, lice counts were higher on sea trout in July 2024 (average 35 lice per fish; 0.2 lice per gram of fish) than in July 2023. Many fish sampled in September 2024 had damaged dorsal fins indicating that lice had been shed prior to being sampled.

Table 2: Sea trout monitoring days at Applecross in 2023 and 2024

Visit	Date	Methods used	Number of trout processed
#1	25th May 2023	Seine net sea pool of river	42
#2	21st June 2023	Seine net sea pool of river	30
#3	19th July 2023	Seine net sea pool of river	33
#4	16th August 2023	Seine net sea pool of river	36
#5	27th September 2023	Seine net sea pool of river	0

Visit	Date	Methods used	Number of trout processed
#1	29th May 2024	Seine net sea pool of river	1
#2	25th June 2024	Seine net sea pool of river	35
#3	24th July 2024	Seine net sea pool of river	29
#4	23rd September 2024	Seine net sea pool of river	24

2.2 Wild fish monitoring at Applecross in 2025

WRFT was contracted to sample sea trout at Applecross on three occasions between May and September 2025 for the purposes of assessing sea lice burdens and associated factors (Table 3).

Table 3: Sea trout monitoring days at Applecross in 2025

Visit	Date	Methods used	Number of trout processed
#1	13th June 2025	Seine net sea pool of river	30
#2	13th August 2025	Seine net sea pool of river	24
#3	11th September 2025	Seine net sea pool of river	13

Each visit again focussed on using a seine net. The sampling team included experienced snorkellers to man-handle the lead line of the seine net over the riverbed of the sea pool where there were many stones that snagged the net and would otherwise have made netting ineffective.

The net used was approx. 47m x 3m of mesh size 14mm knot to knot was used with floats on top and lead weighted line on bottom.

On each occasion the minimum team size was five people, comprising two or more from the WRFT core group (setting off in the morning from Gairloch) and remaining team members from the Applecross area including Applecross Trust staff.

In June, more fish were caught than required, so many of the fish were released from the net prior to processing. Those retained for processing (a random sample) were transferred to a tub. On other occasions, all the fish captured were processed.

Fish were lightly sedated using anaesthetic (eugenol). The length (in mm), weight (to nearest 5g) and records of the following were noted: numbers of sea lice (three categories of *Lepeophtheirus salmonis*; check for adult *Caligus elongatus*), dorsal fin damage score (0 [no damage] – 3 [over 2/3 of dorsal fin eroded away]), predator damage, and 'black spots' (*Cryptocotyle lingua*) spots per cm^2 of caudal fin. Scale samples and photos were taken. All fish were returned to the river following recovery.

2.3 Sea lice monitoring results

Results are presented in Tables 3a-3c

Altogether 67 sea trout were processed, 30 fish in June, 24 fish in August, and 13 fish in September.

On 13th June 2025 (Table 3a), 30 trout were processed of lengths 165mm to 450mm. Most of these fish carried high numbers of sea lice, with eight of the thirty carrying more than 0.3 lice per gram of fish. Several of the trout which had fewer lice had dorsal fin damage and other marks indicative of previous infestation by higher numbers of lice. The estimated mortality – early return to freshwater score was 41% of the sample (c. Tarranger et al 2014).

On 13th August 2025 (Table 3b), 24 trout were processed of lengths 179mm to 355mm. Lice levels on most of these fish were lower than in the June sample; however, four fish carried high numbers of lice and were in the 'red' category regarding numbers of lice per gram of fish mass. Condition factor scores were low; many of these fish were rather thin for the time of year.

The final sample was taken on 11th September (Table 3c). Most of the fish in this sample were small trout including 'brown' trout of less than 200mm, some of which may have remained in or close to freshwater through the summer. Only two of the fish in this sample carried sea lice.

Table 3a ***Data recorded for sea trout sampled at Applecross in 2025****. All fish taken in the sea pool of the Applecross River using a seine net by WRFT team.*

Details of lice stages, dorsal fin damage, predator damage and *Cryptocotyle lingua* spots on caudal fin on sea trout sampled at Applecross in 2025. Including calculation for projected mortality based on method described by Taranger *et al* 2014 and adopted by Fisheries Management Scotland for analyses of Scottish Government funded sweep netting within the West of Scotland in 2022. Legend and further explanation of colour scheme can be found below Table 3c.

Sample #1: 13th June 2025 (see below Table 3c for explanation)

13th June				*Caligus*	*Lepeophtheirus salmonis*																		
Fish	**length (mm)**	**weight (g)**	**condition factor**	**total**	**Copepodid & Chalimus (estimate)**	**Pre-adult & adult**	**Ov. female**	**Total L. salmonis sea lice**	***estimated lice/g fish weight**	**Dorsal fin damage**	***Cryptocotyle ligua spots per cm2 of caudal fin***	**Predator damage**	**Photo**	**scale sample?**	**Comments**	**≥13 lice/fish?**	**Lice/g fish weight**	**Range**	**Mortality category**	**Number of fish in category**	**Total number of fish in sample**	**% of sample in category**	**projected mortality for category %**	**projected mortality of fish in sample %**
1	300	280	1.04	0	50	17	0	**67**	0.239	2.0	1	N	Y	y	raw fin	Yes	0.239	>0.3	100%	8	30	26.67	26.67	
2	193	57	0.79	0	8	3	0	**11**	0.193	0.5	2	N	Y	y		No	0.193	0.2-0.3	50%	7		23.33	11.67	
3	330	308	0.86	0	0	3	0	**3**	0.010	1.0	0	N	Y	y		No	0.010	0.1-0.2	20%	4		13.33	2.67	
4	450	1032	1.13	0	3	13	1	**17**	0.016	2.0	0	N	Y	y		Yes	0.016	<0.1	0%	11		36.67	0.00	**41.00**
5	188	68	1.02	0	8	10	0	**18**	0.265	1.0	0	N	Y	y		Yes	0.265							
6	349	400	0.94	0	0	2	0	**2**	0.005	2.0	2	Y	Y	y	bird beak; has had lice	No	0.005							
7	246	160	1.07	0	10	11	0	**21**	0.131	1.0	0	N	Y	y		Yes	0.131							
8	200	85	1.06	0	8	3	0	**11**	0.129	0.5	1	N	Y	y		No	0.129							
9	183	54	0.88	0	15	7	1	**23**	0.426	1.0	0	N	Y	y		Yes	0.426							
10	194	80	1.10	0	21	2	0	**23**	0.288	1.0	3	N	Y	y		Yes	0.288							
11	171	48	0.96	0	3	0	0	**3**	0.063	0.0	2	N	Y	y		No	0.063							
12	223	105	0.95	0	0	0	0	**0**	0.000	1.5	1	N	Y	y	has had many lice	No	0.000							
13	193	52	0.72	0	13	1	0	**14**	0.269	0.5	0	N	Y	y	split ail	Yes	0.269							
14	206	68	0.78	0	53	0	0	**53**	0.779	2.0	1	Y	Y	y	lice pics; old pred damage	Yes	0.779							
15	251	145	0.92	0	2	1	0	**3**	0.021	2.0	0	N	Y	y		No	0.021							
16	215	90	0.91	0	0	0	0	**0**	0.000	2.0	0	N	Y	y		No	0.000							
17	180	56	0.96	0	40	5	0	**45**	0.804	1.0	0	N	Y	y	dorsal fin pic	Yes	0.804							
18	332	390	1.07	0	3	20	0	**23**	0.059	1.0	0	N	Y	y	has been heavily liced	Yes	0.059							
19	195	60	0.81	0	24	1	0	**25**	0.417	0.5	0	N	Y	y	has had 100+ lice	Yes	0.417							
20	197	79	1.03	0	16	0	0	**16**	0.203	1.0	0	N	Y	y	caudal fin damage	Yes	0.203							
21	207	96	1.08	0	37	3	0	**40**	0.417	1.0	0	N	Y	y		Yes	0.417							
22	165	47	1.05	0	85	0	0	**85**	1.809	0.2	0	N	Y	y	Lice pics	Yes	1.809							
23	335	395	1.05	0	2	2	1	**5**	0.013	2.0	0	N	Y	y	raw dorsal fin	No	0.013							
24	163	45	1.04	0	2	0	0	**2**	0.044	0.5	1	N	Y	y		No	0.044							
25	178	50	0.89	0	8	4	0	**12**	0.240	0.5	2	N	Y	y		No	0.240							
26	170	44	0.90	0	15	3	0	**18**	0.409	0.5	0	N	Y	y		Yes	0.409							
27	175	51	0.95	0	14	0	0	**14**	0.275	1.0	0	N	Y	y		Yes	0.275							
28	165	45	1.00	0	8	0	0	**8**	0.178	0.0	0	N	Y	y	Net damage	No	0.178							
29	173	51	0.98	0	37	0	0	**37**	0.725	0.2	0	N	Y	y		Yes	0.725							
30	158	42	1.06	0	0	0	0	**0**	0.000	0.2	0	N	Y	y		No	0.000							
Averages	**222.83**	**149.43**	**0.97**	**0.00**	**16.17**	**3.70**	**0.10**	**19.97**	**0.28**	**0.99**	**0.53**													

Table 3b ***Data recorded for sea trout sampled at Applecross in 2025****. All fish taken in the sea pool of the Applecross River using a seine net by WRFT team.*

Sample #2: 13th August 2025 (see below Table 3c for explanation)

13th Aug				***Caligus***	***Lepeophtheirus salmonis***																		
Fish	**length (mm)**	**weight (g)**	**condition factor**	**total**	**Copepodid & Chalimus (estimate)**	**Pre-adult & adult**	**Ov. female**	**Total L. salmonis sea lice**	***estimated lice/g fish weight**	**Dorsal fin damage**	***Cryptocotyle ligua spots per cm2 of caudal fin***	**Predator damage**	**Photo**	**scale sample?**	**Comments**	**≥13 lice/fish?**	**Lice/g fish weight**	**Range**	**Mortality category**	**Number of fish in category**	**Total number of fish in sample**	**% of sample in category**	**projected mortality for category %**	**projected mortality of fish in sample %**
31	245	150	1.02	0	70	2	0	**72**	0.480	0.5	3	N	Y	y	raw dorsal fin	Yes	0.480	>0.3	100%	4	24	16.67	16.67	
32	253	155	0.96	0	5	0	0	**5**	0.032	0.0	1	N	Y	y	split dorsal fin	No	0.032	0.2-0.3	50%	1		4.17	2.08	
33	260	160	0.91	0	0	1	0	**1**	0.006	1.0	0	N	Y	y	thin	No	0.006	0.1-0.2	20%	0		0.00	0.00	
34	278	191	0.89	0	0	0	0	**0**	0.000	0.5	1	N	Y	y		No	0.000	<0.1	0%	19		79.17	0.00	**18.75**
35	355	382	0.85	0	0	0	0	**0**	0.000	1.0	0	N	Y	y	very thin, raw dorsal fin	No	0.000							
36	270	190	0.97	0	0	0	0	**0**	0.000	0.5	1	N	Y	y	fat fish	No	0.000							
37	240	122	0.88	0	0	0	0	**0**	0.000	0.5	0	N	Y	y	pink dorsal fin; photo taken	No	0.000							
38	230	124	1.02	0	6	0	0	**6**	0.048	1.0	1	N	Y	y		No	0.048							
39	257	140	0.82	0	0	0	0	**0**	0.000	0.0	0	N	Y	y	pink dorsal fin	No	0.000							
40	242	129	0.91	0	45	1	0	**46**	0.357	2.0	0	N	Y	y	lice pictures (tatty fin)	Yes	0.357							
41	218	97	0.94	0	5	0	0	**5**	0.052	0.0	1	N	Y	y	pink dorsal fin	No	0.052							
42	218	95	0.92	0	0	0	0	**0**	0.000	1.0	0	N	Y	y	ragged dorsal fin	No	0.000							
43	190	68	0.99	0	0	0	0	**0**	0.000	0.0	0	N	Y	y		No	0.000							
44	190	56	0.82	0	0	0	0	**0**	0.000	0.0	1	old	Y	y		No	0.000							
45	184	60	0.96	0	0	0	0	**0**	0.000	0.0	1	N	Y	y		No	0.000							
46	220	100	0.94	0	0	0	0	**0**	0.000	0.0	0	N	Y	y		No	0.000							
47	203	73	0.87	0	16	0	0	**16**	0.219	0.5	0	N	Y	y		Yes	0.219							
48	200	68	0.85	0	0	0	0	**0**	0.000	0.5	0	N	Y	y	thinnish	No	0.000							
49	202	64	0.78	0	50	6	0	**56**	0.875	0.5	1	N	Y	y	skinny tatty fish	Yes	0.875							
50	180	58	0.99	0	2	0	0	**2**	0.034	0.0	1	N	Y	y		No	0.034							
51	180	55	0.94	0	52	0	0	**52**	0.945	1.0	0	N	Y	y	skinny; pics of lice	Yes	0.945							
52	179	43	0.75	0	0	1	0	**1**	0.023	0.5	0	N	Y	y		No	0.023							
53	180	50	0.86	0	0	0	0	**0**	0.000	0.0	0	N	Y	y		No	0.000							
54	180	52	0.89	0	0	0	0	**0**	0.000	0.0	0	N	Y	y	silvery	No	0.000							
Averages	**223.08**	**111.75**	**0.91**	**0.00**	**10.46**	**0.46**	**0.00**	**10.92**	**0.13**	**0.46**	**0.48**													

Table 3c ***Data recorded for sea trout sampled at Applecross in 2025****. All fish taken in the sea pool of the Applecross River using a seine net by WRFT team.*

Sample #3: 11th September 2025 (see below for explanation)

Fish	length (mm)	weight (g)	condition factor	total	Copepodid & Chalimus (estimate)	Pre-adult & adult	Ov. female	Total L. salmonis sea lice	*estimated lice/g fish weight	Dorsal fin damage	*Cryptocotyle ligua spots per cm2 of caudal fin*	Predator damage	Photo	scale sample?	Comments	≥13 lice/fish?	Lice/g fish weight	Range	Mortality category	Number of fish in category	Total number of fish in sample	% of sample in category	projected mortality for category %	projected mortality of fish in sample %
55	300	274	1.01	0	6	0	0	**6**	0.022	1.5	0	N	Y	y		No	0.022	>0.3	100%	0	8	0.00	0.00	
56	280	262	1.19	0	0	0	0	**0**	0.000	0.0	0	N	Y	y	Estuarine trout	No	0.000	0.2-0.3	50%	0		0.00	0.00	
57	340	374	0.95	0	10	0	0	**10**	0.027	2.0	0	N	Y	y		No	0.027	0.1-0.2	20%	0		0.00	0.00	
58	165	39	0.87	0	0	0	0	**0**	0.000	0.0	0	N	Y	y	Brown trout	No	0.000	<0.1	0%	8		100.00	0.00	**0.00**
59	167	42	0.90	0	0	0	0	**0**	0.000	0.0	0	N	Y	y		No	0.000							
60	130	not weighed	nr	0	0	0	0	**0**	nr	0.0	0	N	Y	y		No	nr							
61	165	34	0.76	0	0	0	0	**0**	0.000	0.0	0	N	Y	y		No	0.000							
62	182	53	0.88	0	0	0	0	**0**	0.000	0.0	0	N	Y	y	estuarine trout	No	0.000							
63	170	40	0.81	0	0	0	0	**0**	0.000	0.0	0	N	Y	y	brown trout	No	0.000							
64	128	not weighed	nr	0	0	0	0	**0**	nr	0.0	0	N	Y	y	too small to weigh	No	nr							
65	140	not weighed	nr	0	0	0	0	**0**	nr	0.0	0	N	Y	y	too small to weigh	No	nr							
66	150	not weighed	nr	0	0	0	0	**0**	nr	0.0	0	N	Y	y	too small to weigh	No	nr							
67	136	not weighed	nr	0	0	0	0	**0**	nr	0.0	0	N	Y	y	too small to weigh	No	nr							
Averages	**188.69**	**139.75**	**0.92**	**0.00**	**1.23**	**0.00**	**0.00**	**1.23**	**0.01**	**0.27**	**0.00**													

Explanation (for Table 3a – 3c):

Dorsal fin damage score: '1' is for up to 1/3 of fin damaged; '2' is for >1/3 an <2/3 of fin damaged; '3' is for over 2/3 of dorsal fin damaged
Estimation of projected mortality or early return to freshwater from Taranger et al 2014:

Notes:

based on the assumption that small salmonid post-smolts (<150g body weight) will suffer 100% lice-related marine mortality, or return prematurely to freshwater for sea trout in the wild if the are infected with >0.3 lice per g of fish weight.
Furthermore, the lice related marine mortality is estmated to 50%, if the infection is between 0.2 and 0.3 lice per g fish weight, 20% if the infection rate is between 0.1 and 0.2 lice per g fish weight, and finally 0% if the salmon lice infection is <0.1 g fish weight.

0.05 and 0.1 lice per g fish weight, 20% for lice infections between 0.05 and 0.01 lice per g fish weight, and finally 0% if the salmon lice infection is <0.01 lice g fish weight.

colour code

Taranger, G. L., Karlsen, Ø., Bannister, R. J., Glover, K. A., Husa,V., Karlsbakk, E., Kvamme, B. O., Boxaspen, K. K., Bjørn, P. A., Finstad, B., Madhun, A. S., Morton, H. C., and Sva˚sand, T. (2014) Risk assessment of the environmental impact of Norwegian Atlantic salmon farming. – ICES Journal of Marine Science, doi: 10.1093/icesjms/fsu132.
https://www.researchgate.net/publication/266672998_Risk_assessment_of_the_environmental_impact_of_Norwegian_Atlantic_salmon_farming

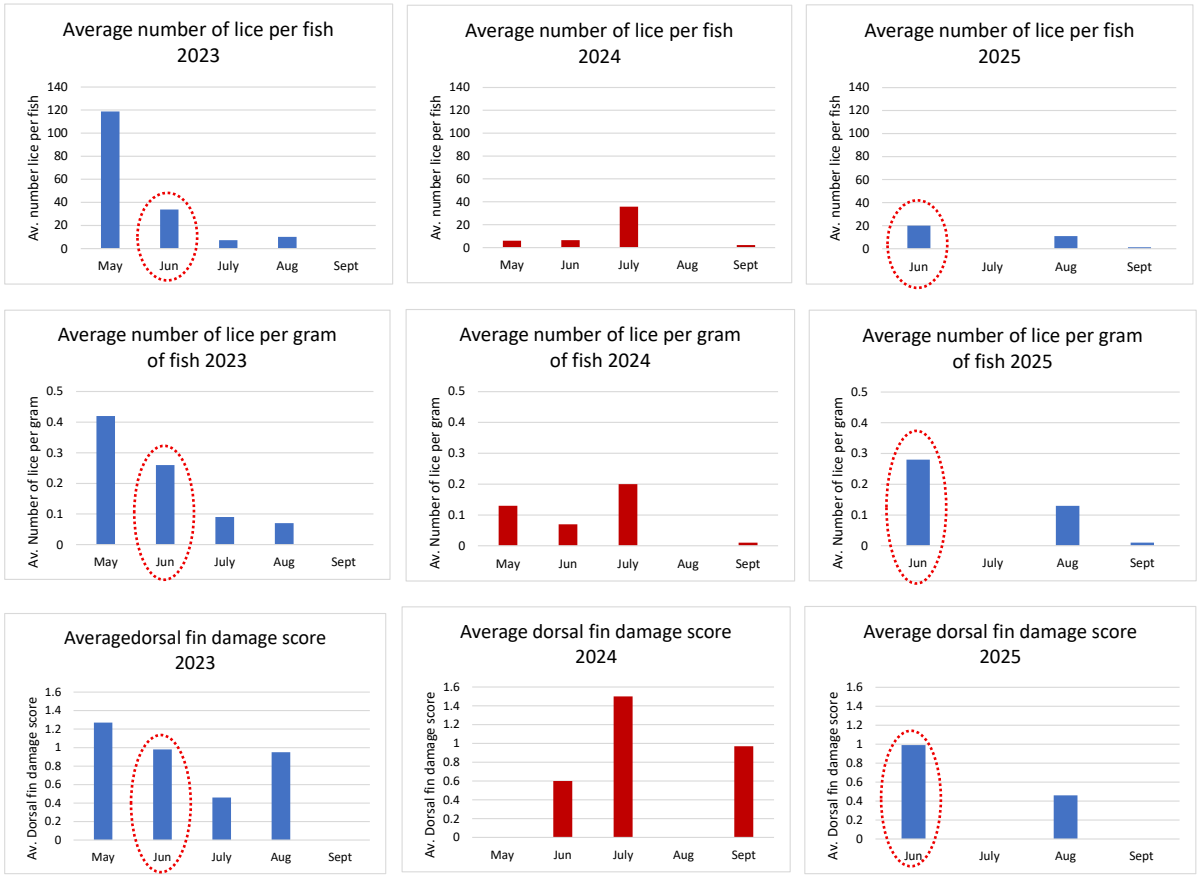
100% sea lice related mortality or early return to freshwater
>50% to 99% sea lice related mortality or early return to freshwater
>20% to 50% sea lice related mortality or early return to freshwater

2.4 Sea lice monitoring discussion

2.4.1 Sea lice infestation levels in 2025 compared to previous years

Sampling at Applecross in 2025 was again successful in so far as being able to obtain useful numbers of fish and to be able to assess levels of sea lice infestation and associated damage to sea trout. Figure 4 contrasts the results for samples of sea trout taken in 2025 with those taken in 2023 and 2024.

Figure 4. Summary graphs for sea lice counts and associated damage for samples of sea trout taken at Applecross in 2025 compared to 2023 and 2024. Outlined in dotted red are scores for June 2023 and June 2025, to highlight close similarities, and differences from June 2024 sample.



In contrast to 2023 and 2024 when sea trout were sampled on four occasions at Applecross, only three samples were taken in 2025, starting in June 2025 with a sample which included many small post-smolt sea trout (in 2023 and 2024 the first sample in May was mostly of larger sea trout).

Lice levels and dorsal fin damage scores for sea trout sampled in June 2025 were similar to those recorded in the June 2023 sample, and indicative of high sea lice infestation pressure in nearby waters earlier in the year, with averages of over 0.2 lice per gram of sea trout recorded on sea trout in June of both years. These averages were higher than for the sample taken in June 2024.

The average numbers of sea lice per fish and dorsal fin damage scores in the August 2025 sample was lower than in the June 2025 sample; however, many fish in August were thin with low condition factor scores. Some of the small, damaged sea trout with high counts of sea lice recorded in June may not have survived until August.

The September sample included many small trout which may not have moved far from freshwater.

All the fish in 2025, as in 2023 and 2024, were taken in the sea pool of the Applecross River, just after high tide. The tide only reaches this pool in spring tides. Some of the smaller fish may have remained here with perhaps only occasional short-term excursions into the salty sea water when the tide is in.

Thus, this sampling site is a place where sea trout that are experiencing discomfort from sea louse infestation may 'return early' too, and where they can rid themselves of sea lice. Early-stage *L. salmonis* lice may detach from sea trout in freshwater after a few days (Wright et al, 2016); for larger mobile lice this can take up to two weeks.

So as in previous years, many of the fish in the samples taken at Applecross in 2025 may have been early-returned fish; sea trout that had moved into freshwater because they were in discomfort from sea lice infestation.

2.4.2 Possible origins of sea lice on sea trout at Applecross in 2025

Table 4 provides some published data for reported adult female sea lice counts on salmon farms in the area for spring – summer 2024, reproduced here for comparison with Table 5 for 2025, below.

Table 4. Reported adult female sea lice counts and reported monthly biomass figures for nearby salmon farms for April to September 2024 from Scotland Aquaculture website (http://aquaculture.scotland.go.uk/). Figures highlighted in bold and in pink suggested several potential sources of larval sea lice within 30km of Applecross.

Reported adult female sea lice figures (from Scotland's Aquaculture website)														
Site	Portree	Potree Outer	Sconser Quary	Maol Ban	Cairaidh	Scalpay	Loch Alsh	Ardintoul	Loch Duich	Kishorn West	Kishorn A	Kishorn B	West Strome	Sgeir Dughall
Company	Bakkafrost	Bakkafrost	MOWI	MOWI	MOWI	MOWI	MOWI	MOWI	MOWI	SSF	SSF	SSF	Bakkfrost	Bakkfrost
Distance to Applecross (km approx)	30	30	19	23	20	18	22	26	31	17	21	24	26	26
Week (2024)														
38 (Sep)	fallow	fallow	**0.64**	0	0.02	0.1	**0.47**	fallow	0	fallow	fallow	fallow	0	fallow
37 (Sep)	fallow	fallow	**0.58**	0.28	**1.75**	0.12	**0.46**	fallow	0	fallow	fallow	fallow	0	fallow
36 (Sep)	fallow	fallow	**0.71**	**0.88**	**1.62**	0.11	**0.32**	fallow	0	fallow	fallow	fallow	0	fallow
35 (Aug)	fallow	fallow	**1.01**	**0.95**	**0.9**	0.11	**0.34**	fallow	0	fallow	fallow	fallow	0	fallow
34 (Aug)	fallow	fallow	**1.02**	**0.29**	0.15	0.2	0.26	fallow	0	fallow	fallow	fallow	fallow	fallow
33 (Aug)	fallow	fallow	**0.84**	**0.43**	0.03	0.15	fallow	fallow	0	fallow	fallow	fallow	fallow	fallow
32 (Aug)	fallow	fallow	0.221429	0.09	0.033333	0.225	fallow	fallow	fallow	fallow	fallow	fallow	fallow	fallow
31 (July)	fallow	fallow	0.16	0.03	0.01	0.11	fallow	fallow	fallow	fallow	fallow	fallow	fallow	fallow
30 (July)	fallow	fallow	0.04	**0.54**	0.28	0.09	fallow	fallow	fallow	fallow	fallow	fallow	fallow	fallow
29 (July)	fallow	fallow	0.01	0.19	0.28	0.05	fallow	fallow	fallow	fallow	fallow	fallow	fallow	fallow
28 (July)	fallow	fallow	0.01	0.28	0.23	0.04	fallow	fallow	fallow	fallow	fallow	fallow	fallow	fallow
27 (July)	fallow	fallow	0.17	0.29	0.12	0.01	fallow	fallow	fallow	fallow	fallow	fallow	fallow	fallow
26 (June)	fallow	fallow	0.125	0.164706	0.029412	0.02	withdraw	withdraw	withdraw	fallow	fallow	fallow	fallow	fallow
25 (June)	fallow	fallow	0.18	0.14	0.1	0.01	withdraw	withdraw	withdraw	fallow	fallow	fallow	fallow	fallow
24 (June)	fallow	fallow	0.11	0.05	0	0.03	withdraw	withdraw	withdraw	fallow	fallow	fallow	fallow	fallow
23 (June)	fallow	fallow	0.18	0.03	0	0.06	0.4	withdraw	withdraw	fallow	fallow	fallow	fallow	fallow
22 (June)	fallow	fallow	0.03	0.00	fallow	0.01	**0.41**	**0.2**	**0.40**	fallow	fallow	fallow	fallow	fallow
21 (May)	fallow	fallow	0.05	0	fallow	0	**0.47**	**0.32**	**0.40**	fallow	fallow	fallow	fallow	fallow
20 (May)	fallow	fallow	0.03	0	fallow	0	**0.48**	**0.34**	**0.40**	fallow	fallow	fallow	fallow	fallow
19 (May)	fallow	fallow	0.08	0	fallow	0	**0.48**	**0.37**	**0.40**	fallow	fallow	fallow	fallow	fallow
18 (May)	withdraw	fallow	0.02	0	fallow	0	**0.35**	**0.36**	0.3	fallow	fallow	fallow	fallow	fallow
17 (April)	0.4	fallow	0	fallow	fallow	0	**0.19**	**0.32**	0.12	fallow	fallow	fallow	fallow	fallow
16 (April)	0.4	fallow	fallow	fallow	fallow	0	0.08	0.31	0.2	fallow	fallow	fallow	fallow	fallow
15 (April)	0.37	fallow	fallow	fallow	fallow	falllow	0.07	0.32	0.17	fallow	fallow	fallow	fallow	fallow
14 (April)	0.33	fallow	fallow	fallow	fallow	falllow	0.08	0.36	0.12	fallow	fallow	fallow	fallow	fallow
Reported monthly biomass (tonnes)														
Sept	?	?	?	?	?	?	?	?	?	?	?	?	?	?
Aug	?	?	?	?	?	?	?	?	?	?	?	?	?	?
July	?	?	?	?	?	?	?	?	?	?	?	?	?	?
June	0	0	1749	633	366	310	**1479**	**917**	1381	0	0	0	0	0
May	0	0	1498	483	0	186	**1984**	**2497**	1581	0	0	0	0	0
April	544	0	457	0	0	115	**2219**	**2453**	1599	0	0	0	0	0
March	545	0	0	472	0	0	2182	2099	2094	0	0	0	945	0
February	966	334	575	826	0	0	2059	1928	2112	0	0	0	1529	0
http://aquaculture.scotland.gov.uk/														

Table 5 is the same table (as Table 4) for April to September 2025.

Table 5. Reported adult female sea lice counts and reported monthly biomass figures for nearby salmon farms (within 30km of Applecross) for April to September 2025 from Scotland Aquaculture website (http://aquaculture.scotland.go.uk/). Figures highlighted in bold and in pink suggest several potential sources of larval sea lice.

Reported adult female sea lice figures (from Scotland's Aquaculture website)													
Site	Portree	Potree Outer	Sconser Quary	Maol Ban	Cairaidh	Scalpay	Loch Alsh (Sron)	Ardintoul	Loch Duich	Kishorn West	Kishorn East	West Strome	Sgeir Dughall
Company	Bakkafrost	Bakkafrost	MOWI	MOWI	MOWI	MOWI	MOWI	MOWI	MOWI	SSF	SSF	Bakkfrost	Bakkfrost
Distance to Applecross (km approx)	30	30	19	23	20	18	22	26	31	17	21	26	26
Week (2025)													
38 (Sep)	0.24	0.16	0.04	0.21	1.03	0.54	0.39	0	0.09	0.80	0.83	3.11	fallow
37 (Sep)	0.21	0.4	0.29	0.33	1.08	0.89	0.22	0	0.2			1.23	fallow
36 (Sep)	1.29	0.7	0.22	1.14	2.25	1.26	0.4	0	0.48	2.10		1.74	fallow
35 (Aug)	0.48	0.61	0.13	0.25	1.09	0.51	0.46	0.01	0.15	1.54	2.40	2.18	fallow
34 (Aug)	0.04	0.01	0.03	0.09	0.71	0.23	0.3	0	0.21	0.86	1.43	1.14	fallow
33 (Aug)	0.21	0.35	0.06	0.07	0.45	0.06	0.32	0.02	0.44	0.12	0.13	3.95	1.9
32 (Aug)	1.09	1.04	0.18	0.07	0.19	0.01	0.31	0.01	0.99	2.96		2.13	1.6
31 (July)	0.93	0.48	0.13	0.1	0.28	0.01	0.31	0.01	0.96	2.39	3.97	0.93	2
30 (July)	0.69	0.59	0.19	0.06	0.06	0.38	0.41	0.02	0.44	1.65	2.52	2.45	1.11
29 (July)	0.54	0.48	0.17	0.16	0	0.35	0.37	0.01	0.14	0.30	0.73	1.36	1.04
28 (July)	0.14	0.11	0.26	0.11	fallow	0.15	0.24	0.01	0.08			1.15	1.9
27 (July)	0.12	0.05	0.15	0.38	fallow	0.23	0.48	0.04	0.14	2.02	0.48	0.38	1.93
26 (June)	0.09	0.07	0.12	0.37	fallow	0.17	0.43	0.02	0.05	0.21	1.13	1.88	1.68
25 (June)	0.05	0.02	0.03	0.13	fallow	0.06	0.4	0.01	0.06	0.11	0.30	1.2	1.27
24 (June)	**0.68**	**0.54**	0.03	0.13	fallow	0.05	0.34	0.03	0.09	0.09	0.20	0.41	0.93
23 (June)	0.46	**0.54**	0	0.06	fallow	0.01	**0.8**	0.01	0.03		fallow	0.61	0.23
22 (June)	0.43	0.34	0.00	0.01	fallow	0	**1.95**	0.04	0.02		fallow	**1.67**	1.58
21 (May)	0.34	0.24	0	0.01	fallow	0.43	**0.78**	0.04	0.03	0.24	fallow	**1.13**	0.97
20 (May)	0.25	0.31	fallow	0	fallow	0.45	0.26	0.06	0.02	0.08	fallow	0.32	0.26
19 (May)	0.29	0.15	fallow	fallow	fallow	0.4	0.26	0.03	0.03	0.01	fallow	0.48	0.31
18 (May)	0.16	0.14	fallow	fallow	fallow	0.41	0.1	0.05	0	0.00	fallow	0.27	0.46
17 (April)	0.23	0.05	fallow	fallow	fallow	0.32	0.12	0.03	0	0.05	fallow	0.11	0.29
16 (April)	0.25	0.03	fallow	fallow	fallow	0.22	0.1	0.04	0	0.02	fallow	**0.81**	0.04
15 (April)	0.36	0.1	fallow	fallow	fallow	0.21	0.1	0.02	0	0.00	fallow	0.43	0.71
14 (April)	0.33	0.14	fallow	fallow	fallow	0.18	0.17	0.05	0	0.00	fallow	0.4	0.66
Reported monthly biomass (tonnes)													
Sept	1459	1214	2409	1732	1139	1947	2419	1364	691	1343	435	1789	110
Aug	1456	1192	2388	1410	938	1801	1871	1074	531	1222	366	1712	912
July	1323	1052	1946	1043	313	2057	1411	742	360	986	296	1617	1020
June	933	694	1598	780	0	2377	1078	542	209	785	222	1318	1219
May	714	510	839	585	0	2468	824	390	127	782	0	1107	1440
April	483	327	154	332	0	2429	550	241	72	578	0	866	1386
March	290	208	1038	1342	0	2292	445	161	59	440	0	710	1614
February													

In 2025, one difference from 2024 was that some of the farms in the Loch Kishorn – Loch Carron area and in the East of Skye area that were fallow in spring 2024 were in production during spring 2025 and reported high counts of adult female lice. This was a similar situation to Spring 2023.

As in previous years, there is no single obvious source of the sea lice larvae that infested the sea trout in June and August 2025 Applecross samples. Several farms within 30km of Applecross reported on-farm adult female sea lice counts close to or above Code of Good Practice targets during including Scalpay and West Strome; and for lice on the August sample of sea trout at Applecross also several other farms. Some of these farms may have been stocked with ’000,000s of farm salmon, therefore potentially harbouring a large adult female sea louse population.

2.4.3 Implications for wild salmon populations in nearby rivers

It is important to be able to assess the risk to wild salmon populations (as stated in section 1.2).

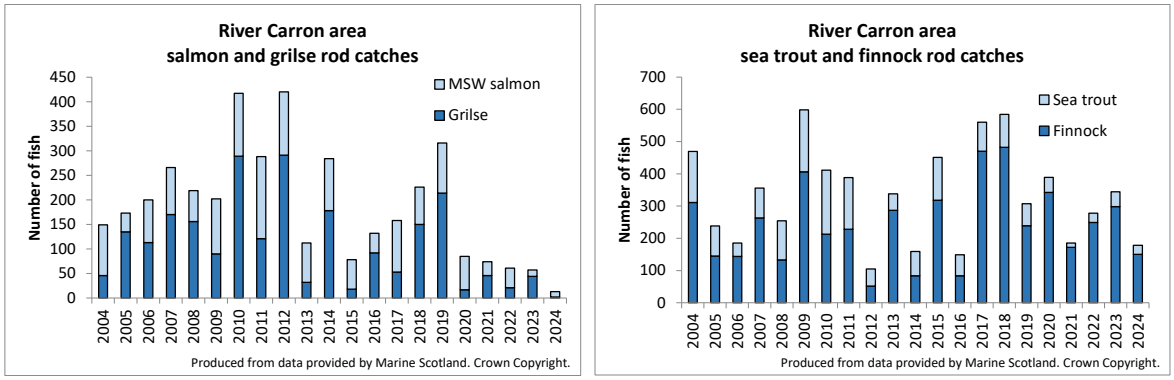
Research in Norway[1] (Vollset *et al*, 2017) has clarified relationships between lice levels on sea trout and on post-smolt salmon migrating nearby. It is beyond the scope of this report to provide a prediction of % mortality for post-smolt salmon migrating through the Inner Sound; however, by following Vollset et al (2017), such an estimate could be made using data provided here and from sampling sites on the east of Skye.

If the post-smolt salmon that migrate through coastal waters close to Applecross are subject to the same sea lice infestation pressures as the sea trout recorded at Applecross, one might expect fewer returns of grilse to nearby rivers following years where higher numbers of sea lice are recorded on sea trout at Applecross.

The wild fish monitoring report for Applecross for 2023 (Cunningham, 2023) expressed concern that the numbers of returning grilse to nearby rivers in 2024 including the River Carron (from the 2023 post-smolt run) would be very low, following high numbers of sea lice on sea trout at Applecross in May and June 2023 (see Figure 4 and Cunningham, 2023, and Cunningham, 2024).

Figure 5 shows reported rod catches of salmon for the River Carron – Kishorn area to 2024. The reported rod catch of salmon and grilse for the River Caron for 2024 was the lowest for over 20 years, with just 2 grilse recorded in 2025, down from 291 grilse in 2012 (Scottish Government Salmon and Sea trout catches).

Figure 5. Reported rod catch graphs for the Kishorn-Carron area (mostly River Carron rod catch) from which post-smolt salmon must swim through Loch Kishorn and the Inner Sound past Applecross en-route to the open sea. Note the much-reduced reported River Carron salmon and grilse catch following very high numbers of sea lice recorded at Applecross in May and June 2023 (see Cunningham, 2023). Figures are from the Scottish Government's Salmon and Sea trout Catches Shiny App webpage https://scotland.shinyapps.io/sg-salmon-sea-trout-catch/)



Rod catch figures for salmon for 2025 are awaited. In contrast to 2023, the lower burdens of lice on sea trout in May and June 2024 compared to same months in 2023 would suggest lower sea lice infestation pressure in spring and early summer 2024 for post-smolt salmon migrating through the Inner Sound than in 2023. Some initial reports for local rivers from anglers (including those fishing

[1] Vollset et al (2017) Salmon lice infestation on sea trout predicts infestation on migrating salmon post-smolts https://academic.oup.com/icesjms/article/74/9/2354/3860036

the Applecross River and the River Balgy) suggest that 2025 was a more productive year for grilse than 2024.

A relationship between salmon catches in the River Carron and nearby salmon farm production cycles was previously discussed in more detail in the SWRFT Review 2018 (Cunningham et al 2018).

4. Conclusions and recommendations (for discussion)

- Another successful year of sea trout sampling at Applecross, with a total of 67 trout processed over three visits: June, August and September.
- Lice levels on sea trout were high on sea trout taken in June. Most of the lice were small chalimus lice. Some of the fish taken in the August sample also had high numbers of lice.
- As in 2023, there are several possible sources of sea lice that affected sea lice numbers of sea trout at Applecross in 2025.
- Because of the high biomass of salmon farming in the area from which larval lice may drift towards Applecross, all farms need to do as much as they can to synchronise sea lice control and keep on-farm lice levels much lower than recommended CoGP levels.
- It is beyond the scope of this report to comment on likely connectivity between farms (so far as sea lice cross- infection goes); this is something that needs to be explored further to protect wild fish and minimise cross infection of farms operated by different businesses.
- Data can also be used to learn more about relationships between sea lice levels on sea trout at Applecross and wild salmon populations around the Inner Sound area, where post-smolt salmon are likely to migrate through the Inner Sound area and be subject to sea lice potentially emanating from several sources.
- In terms of sample sizes, Applecross may now be the most reliable wild fish monitoring site in the Inner Sound area for assessing sea lice infestation pressure upon wild fish.
- Monitoring of sea trout at Applecross should therefore continue in future years.

Acknowledgements

For help with sea trout sampling in 2025 thank you to Ian Sutherland and Applecross Trust; and Gregor Watson, Alison Hewitt, Rob Macrae, Nic Butler, Chloe and Ant Hall, James Coomer, Nicky Middleton-Jones and Stephen Merrill.

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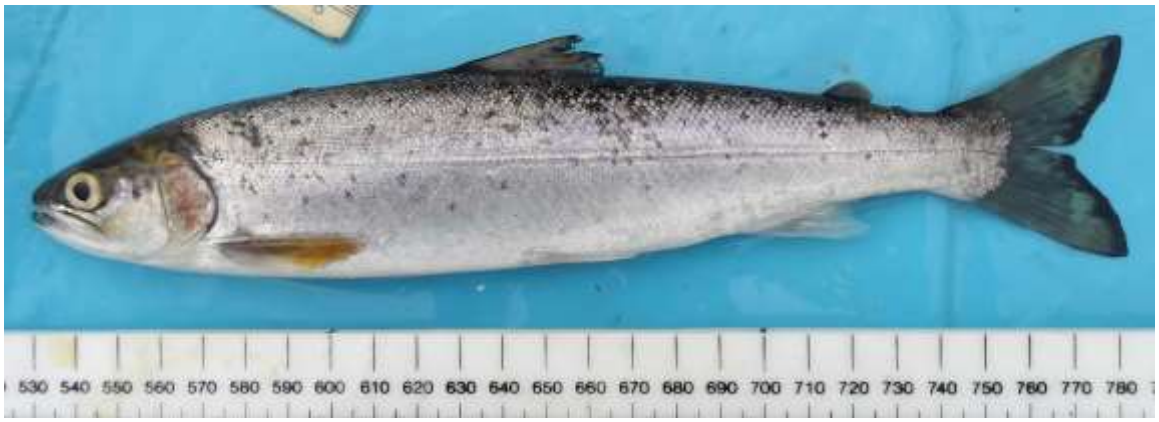
Vollset *et al* (2017) Salmon lice infestation on sea trout predicts infestation on migrating salmon post-smolts https://academic.oup.com/icesjms/article/74/9/2354/3860036

Appendix 1. Sampling at Applecross further notes and some photos

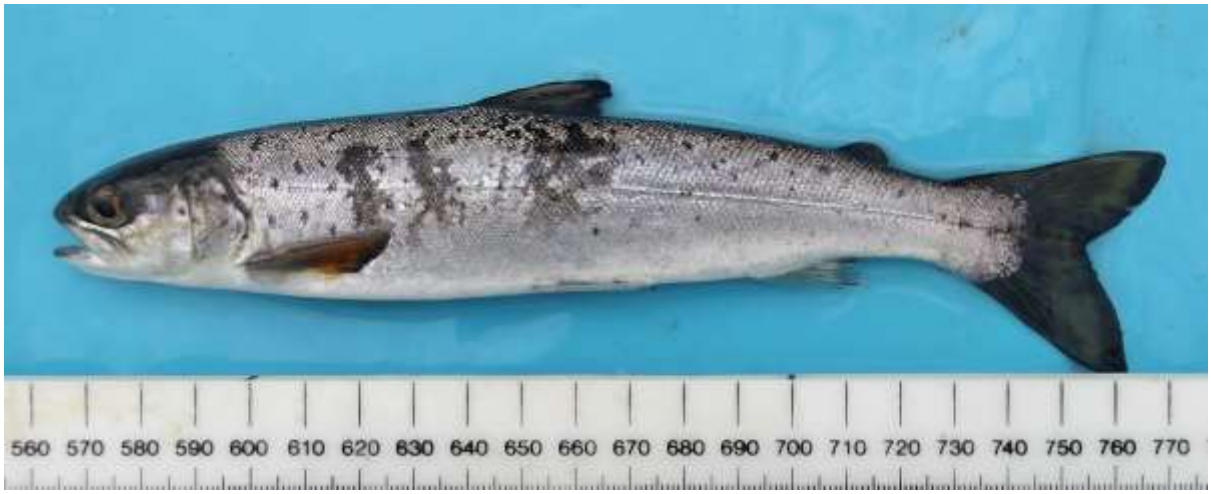
Please note that all fish in photos were lightly sedated before being returned after recovering from anaesthetic

Visit 1: 13th June 2025

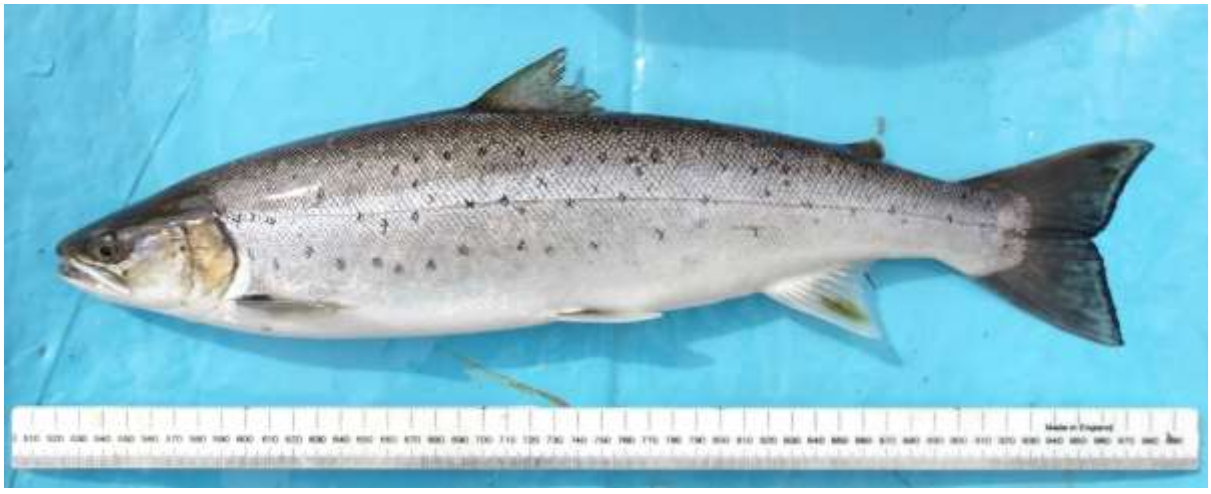
Sea trout 251mm, Applecross, 13th June 2025



Sea trout 206mm, Applecross, 13th June, 2025

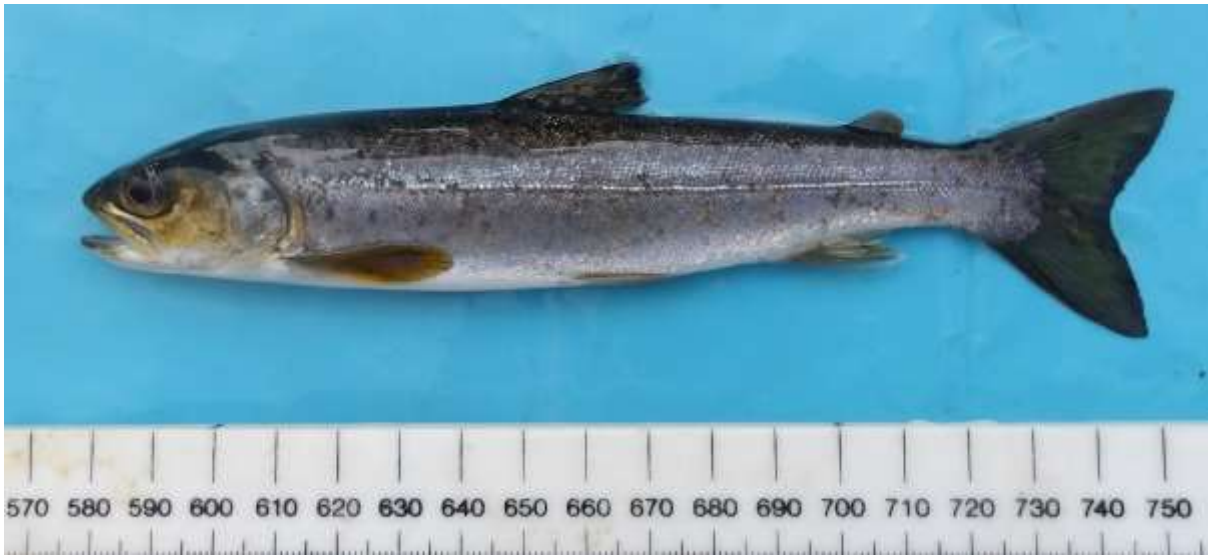


Sea trout 450mm, Applecross, 13th June 2025

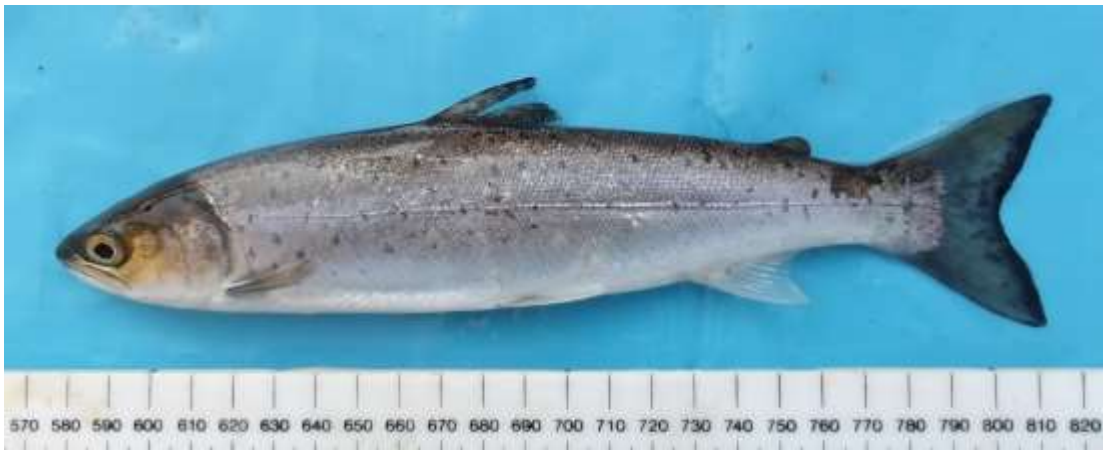


Visit 2: 13th August 2025

Sea trout 180mm, Applecross, 13th August 2025

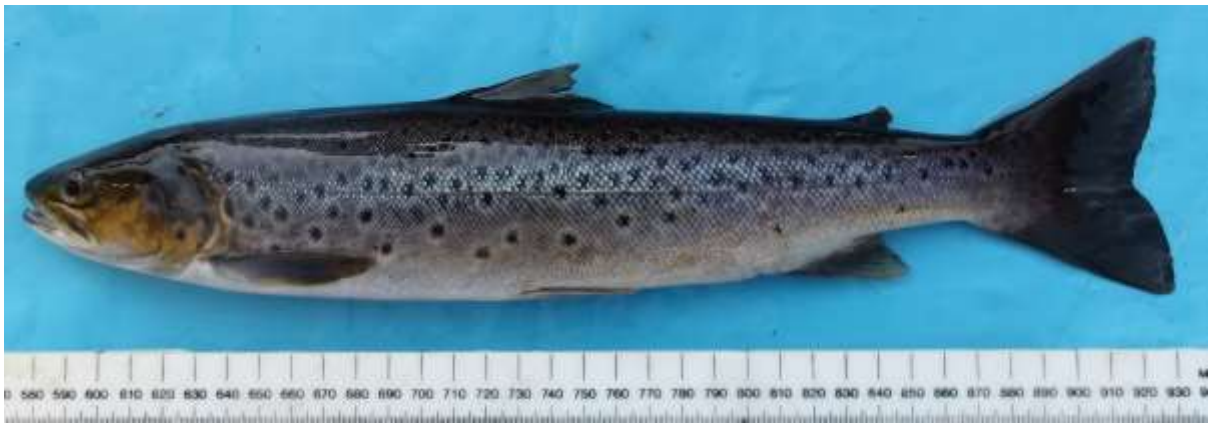


Sea trout 240mm, Applecross 13 Aug 2025



Fins of sea trout 242mm, Applecross, 13 August, 2025

Sea trout 355mm, Applecross, 13 August, 2025



Visit 3: Netting at Applecross, 11th September 2025. Conditions were challenging with strong winds and heavy rain. Pics by CH.

Sea trout, 340mm, Applecross 11 September 2025