Ardmair salmon farm EMP

Sea trout and salmon monitoring report for 2025

for MOWI Scotland Ltd., Wester Ross Area District Salmon Fisheries Board and The Highland Council

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Summary

This document presents the results of wild fish monitoring activities to inform the Ardmair Salmon farm Environment Management Plan [EMP] during the spring, summer and early autumn of 2025.

Seine netting teams were assembled to sample sea trout in the mouth of the River Kanaird and Inverianvie River (close to the Little Gruinard River SAC for Atlantic salmon) between May and September. Permission was granted by local estates for two sweep netting sessions in the Kanaird River estuary in 2025; and for five netting sessions at Inverianvie.

Lice counts were high on sea trout sampled at the Kanaird estuary in May 2025. Lice counts were lower on sea trout taken in the August sample and in all samples taken at the Inverianvie (Gruinard Bay) site.

The high counts of sea lice on sea trout sampled at Kanaird in May correlate with high numbers of sea lice reported from the nearby Ardmair salmon farm during spring 2025. Local anglers also reported catching sea trout with high numbers of sea lice and lice-damaged dorsal fins.

Improved on-farm control of sea lice is essential to adequately protect wild salmon post-smolts and sea trout in 2026.

Primarily to learn more about the status of wild salmon populations, juvenile fish were surveyed at sites in the River Kanaird (and Runie, the major tributary of the River Kanaird) in August 2025, and sites in the Ullapool River, River Broom, River Lael and Gruinard River below Loch na Sealga in September 2025. The Kanaird survey included sites in ‘marginal habitat’ above waterfalls where in previous years juvenile salmon have sometimes been missing. Sites in the Ullapool, Broom, Lael and Gruinard rivers were mostly in ‘core habitat’ areas for wild salmon.

In the River Kanaird, no salmon fry were recorded above the Langwell falls. These falls have been only occasionally passable. Both salmon fry and salmon parr were recorded at moderate to high densities below the Langwell falls. At sites in the Rhidorroch River and River Lael salmon fry and parr were found at low or moderate Catch Per Unit Effort [CPUE].

At the top of the Ullapool river, and in the Gruinard River at all sites, salmon fry were recorded at high densities. Salmon parr were recorded at all sites in the Gruinard River except one site where the water may have been too deep for effectively capturing parr.

Thank you to MOWI and Keanchulish estate for support with sea trout sampling, and to Langwell estate, Keanchulish estate, Rhidorroch estate, East Rhidorroch estate, Gruinard estate and Eilean Darach estate for permissions to survey fish.

1. Introduction and background

1.1 Location, some background information and rationale

This document presents the results of wild fish monitoring activities in 2025 to inform the Ardmair salmon farm Environment Management Plan [EMP], the second year of wild fish monitoring for this EMP.

The Ardmair salmon farm is located within the Wester Ross Marine Protected Area [WR MPA], an area of much biodiversity interest. Priority Marine Features [PMFs] present within the WR MPA include seabed habitats e.g. Maerl beds and Seagrass beds (both included in subset of the 11 most vulnerable PMFs in Scotland) as well as marine mammals and fish species including the Herring, the Atlantic salmon and Sea trout. Over the past year, the MPA has been full of fish and cetaceans, with dolphins, porpoise, minke whale and a humpback whale feeding within 4km of Ardmair in early December 2025.

Salmon rivers which discharge into the Wester Ross Marine Protected Area include the rivers Kanaird, Ullapool, Broom, Dundonnell, Gruinard, Little Gruinard [SAC] and Ewe (Cunningham, 2022). Together, these rivers represent one of few remaining strongholds for wild Atlantic salmon in the west of mainland Scotland.

To provide some protection for wild fish from potential impacts associated with salmon farming, particularly from sea lice infestation, an Environment Management Plan [EMP] was developed for the Ardmair salmon farm. EMPs adopt an 'adaptive management' approach to the control of sea lice on farmed salmon. They aim to learn from the monitoring of wild fish in nearby waters about how best to manage on-farm sea lice to enable wild fish populations to remain healthy.

Open cage salmon farming started at Ardmair in the early 1980s, by Wester Ross Salmon. Wester Ross salmon maintained a hands-on 'artisanal' approach to farm salmon production. In the mid-2010s, sea lice control on the Ardmair salmon farm greatly improved using locally caught wrasse (Cunningham et al, 2016). By early 2020s, the on-farm adult female sea lice population had been maintained at close to zero over several successive production cycles at Ardmair.

Wild sea trout have been netted at the River Kanaird site since 2008 for sea lice monitoring purposes, initially as part of the Tripartite Working Group's wild fish monitoring programme. In some years lice levels were high on sea trout at the Kanaird site with some fish carrying over 100 sea lice. Subsequently, from 2016 to the early 2020s, lice levels recorded on wild fish were much lower. Sea lice numbers were high on sea trout sampled at the Kanaird estuary in May 2024.

As the River Kanaird sea trout monitoring site is located in close proximity (within 3km) to the Ardmair salmon farm and has a long record of providing good data for sea lice monitoring purposes, it was chosen as a sea trout monitoring site for the Ardmair EMP.

To provide a wider data set, sea trout were also sampled from a second sea lice monitoring site at Inverianvie shore (by Gruinard Bay, close to the Little Gruinard SAC).

In addition to sampling of sea trout for sea lice monitoring purposes, the EMP states that juvenile salmon should be monitored in nearby rivers to understand any changes in the status of wild salmon populations.

Figure 1. Locations of active salmon farms in Wester Ross Marine Protected Area (blue, Wester Ross Fisheries; green Scottish Sea Farms), and sea trout sampling sites (orange circles) in 2024. Base map OpenStreetMap thank you.

1.2 Monitoring wild salmonids for the Ardmair salmon farm EMP

In 2025, Wester Ross Fisheries Trust [WRFT] was again commissioned by MOWI Scotland Ltd (MOWI) to monitor sea trout and juvenile salmon in nearby rivers to fulfil EMP wild fish monitoring obligations.

The WRFT sea trout monitoring team carried out sampling for sea trout in the River Kanaird estuary and sea trout at Inverianvie near the mouth of the Little Gruinard River between May and September 2025.

The WRFT electro-fishing team carried out a juvenile fish survey of sites in the River Kanaird in August 2025 and sites in the Ullapool River, River Lael, River Broom and Gruinard River in September 2025.

Part 2 of this report provides a summary of the findings of sea trout monitoring at Kanaird and Inverianvie in 2025; Part 3, a summary of the results from the juvenile fish survey.

Part 2. Monitoring sea lice on sea trout

2.1 Previous wild fish monitoring

Sea trout have been monitored using a sweep net at the River Kanaird site since 2007. The site was initially included as part of the Tripartite Working Group's wild fish monitoring programme, and data was collated and reported by the TWG Regional Development Officer. In more recent years, netting has taken place at this site by the Wester Ross Fisheries Trust survey team with funding from the Scottish Government via Fisheries Management Scotland [FMS]. Sea trout and sea lice monitoring reports for previous years for the Kanaird site can be found in WRFT Reviews and SWRFT Reviews on the WRFT website, and on the Fisheries Management Scotland website via links here.

In 2024, Wester Ross Fisheries / MOWI commissioned WRFT to monitor wild fish at the Kanaird site as part of wild fish monitoring to inform the new Ardmair salmon farm Environment Management Plan [EMP] (Cunningham, 2025).

2.2 Monitoring of sea trout 2025

The WRFT sea trout sampling team completed two visits to the River Kanaird estuary, and five visits to the shore by the Inverianvie River estuary, Gruinard Bay.

The Kanaird sea trout sampling site is located approximately 2km from the Ardmair salmon farm. Sea trout have been monitored at this site for over ten years and in previous years large numbers of trout have been caught. In 2025, two dates were agreed with the estate for sampling sea trout for sea lice monitoring purposes with a seine net; the estate requested that the estuary be kept undisturbed for angling guests when approaches were made to sample sea trout on other dates.

Five visits were organised to the Inverianvie site (Gruinard Bay) to sample sea trout between May and September 2025. The Inverianvie sea trout sampling site is approximately 19km by sea from the Ardmair salmon farm.

Each visit focussed on using a seine net. The net used was approximately 47m x 3m, and of mesh size 14mm knot to knot with floats on top and a lead weighted line on the bottom.

On each occasion, the minimum team size was five people (usually six or more). The sampling team included experienced snorkellers to man-handle the lead line of the seine net over the riverbed or seabed where there were typically many large stones that snagged the net.

Sampling days are listed in Table 2a for the Kanaird site and in Table 2b for the Inverianvie site.

Table 2a: Sea trout monitoring days at Kanaird & Ardmair in 2025

Visit	Date	Methods used	Number of trout processed
#1	26th May 2025	Seine net sea pools of river	7
#2	8th August 2025	Seine net sea pools of river	4

Table 2b: Sea trout monitoring days at Inverianvie shore in 2025

Visit	Date	Methods used	Number of trout processed
#1	30th May 2025	Seine net shore	3
#2	1st July 2025	Seine net shore	1
#3	25th July 2025	Seine net shore	4
#4	4th September 2025	Seine net shore	0
#5	25th September 2025	Seine net shore	15

All fish caught were transferred to a tub. Fish were lightly sedated using fish anaesthetic (eugenol). The length (in mm), weight (to nearest 5g) and records of the following were noted: numbers of sea lice (three life-stage 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 water following recovery.

2.3 Sea lice monitoring results

Results are presented in Table 3 and Table 4

Altogether 34 sea trout were sampled between the two sites.

Sample sizes were smaller than in 2024 for several reasons. On the 26thMay, the River Kanaird was higher than usual after a long period of low water, and the net quickly became clogged with filamentous algae, making pulling the net into the shore difficult. Seven trout were caught. On 8th August the River Kanaird was high again following Storm Floris, and just four trout were caught.

Very high numbers of lice were recorded on three of the seven trout taken in the Kanaird estuary on 26th May, with lice per gram values of up to 1.9 lice per gram of fish on small post-smolt sea trout. Tarranger et al (2015)'s 'red 100% mortality or early return to freshwater' category for sea lice on sea trout is >0.3 lice per gram of fish.

Fish taken in the August sample at the Kanaird carried few or no lice.

The Inverianvie site produced only seven sea trout in total on the first four sampling occasions. A larger sample of 15 trout was taken on the 5th occasion. These fish were mostly in good condition with condition factor scores of over 1.1; and carried few lice. However, seven of the fish in this sample had dorsal fin damage associated with sea lice infestation earlier in the year.

Appendix 1 has pictures of some of the fish sampled at Kanaird and Inverianvie in 2025.

Table 3a ***Data recorded for sea trout sampled at Kanaird in 2025****. All fish taken in 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 Kanaird and Ardmair 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.

Sample #1: River Kanaird estuary,

26-May-25				*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	152	34	0.97	0	1	0	0	**1**	0.029	0	0	N	Y	y		No	0.029	>0.3	100%	3	7	42.86	42.86	
2	143	25	0.85	0	0	0	0	**0**	0.000	0	0	N	Y	y		No	0.000	0.2-0.3	50%	1		14.29	7.14	
3	176	60	1.10	0	18	0	0	**18**	0.300	0	0	N	Y	y		Yes	0.300	0.1-0.2	20%	0		0.00	0.00	
4	168	37	0.78	0	42	0	0	**42**	1.135	1	0	N	Y	y		Yes	1.135	<0.1	0%	3		42.86	0.00	**50.00**
5	177	43	0.78	0	85	0	0	**85**	1.977	1	0	N	Y	y		Yes	1.977							
6	190	58	0.85	0	29	0	0	**29**	0.500	0.5	4	N	Y	y	split tail	Yes	0.500							
7	137	15	0.58	0	0	0	0	**0**	0.000	0	0	N	Y	y		No	0.000							
Averages	**163.29**	**38.86**	**0.84**	**0.00**	**25.00**	**0.00**	**0.00**	**25.00**	**0.56**	**0.36**	**0.57**													

Explanation (for Tables 3a – 3e and Table 4):

Dorsal fin damage score: '1' is for up to 1/3 of fin damaged; '2' is for >1/3 and <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.,	100% sea lice related mortality or early return to freshwater
Madhun, A. S., Morton, H. C., and Sva˚sand, T. (2014) Risk assessment of the environmental impact of Norwegian Atlantic salmon farming.	>50% to 99% sea lice related mortality or early return to freshwater
– ICES Journal of Marine Science, doi: 10.1093/icesjms/fsu132.	>20% to 50% sea lice related mortality or early return to freshwater
	<20% sea lice related mortality or early return to freshwater

https://www.researchgate.net/publication/266672998_Risk_assessment_of_the_environmental_impact_of_Norwegian_Atlantic_salmon_farming

Table 3b & 3c ***Data recorded for sea trout sampled at Kanaird and Ardmair in 2025.*** *All fish taken in using a seine net by WRFT team.*

Sample #2: River Kanaird estuary,

08-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 %**
1	330	365	1.02	0	1	0	0	**1**	0.003	1.5	0	Y	Y	y		No	0.003	>0.3	100%	0	4	0.00	0.00	
2	233	136	1.08	0	0	0	0	**0**	0.000	0	0	Y	Y	y		No	0.000	0.2-0.3	50%	0		0.00	0.00	
3	215	100	1.01	0	0	0	0	**0**	0.000	0	0	Y	Y	y		No	0.000	0.1-0.2	20%	0		0.00	0.00	
4	205	71	0.82	0	0	0	0	**0**	0.000	0	0	Y	Y	y		No	0.000	<0.1	0%	4		100.00	0.00	**0.00**
Averages	**245.75**	**168.00**	**0.98**	**0.00**	**0.25**	**0.00**	**0.00**	**0.25**	**0.00**	**0.38**	**0.00**													

Table 4a, b & c ***Data recorded for sea trout sampled at Inverianvie in 2025.*** *All fish taken in using a seine net by WRFT team. See Table 3 for explanation.*

Sample #1: 30 May 2025

				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	200	73	0.91	0	0	0	0	**0**	0.000	0	0	N	Y	y	thin estuarine trout	No	0.000	>0.3	100%	0	3	0.00	0.00	
2	197	80	1.05	0	0	0	0	**0**	0.000	0	0	N	Y	y	net damaged; estuarine trout	No	0.000	0.2-0.3	50%	0		0.00	0.00	
3	198	70	0.90	0	0	0	0	**0**	0.000	0	0	N	Y	y	brown trout markings	No	0.000	0.1-0.2	20%	0		0.00	0.00	
Averages	**198.33**	**74.33**	**0.95**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**							<0.1	0%	3		100.00	0.00	0.00

Sample #2: 1st July 2025

				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	395	600	0.97	0	2	7	1	**10**	0.017	2	0	Y	Y	y	bird beak; many lice scars	No	0.017	>0.3	100%	0	1	0.00	0.00	
																		0.2-0.3	50%	0		0.00	0.00	
																		0.1-0.2	20%	0		0.00	0.00	
																		<0.1	0%	1		100.00	0.00	**0.00**

Sample #3: 25th July 2025

25-Jul				*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	310	339	1.14	0	0	1	0	**1**	0.003	0	0	N	Y	y		No	0.003	>0.3	100%	0	4	0.00	0.00	
2	200	62	0.78	0	0	0	0	**0**	0.000	0	0	N	Y	y		No	0.000	0.2-0.3	50%	0		0.00	0.00	
3	160	48	1.17	0	0	0	0	**0**	0.000	0	0	N	Y	y		No	0.000	0.1-0.2	20%	0		0.00	0.00	
4	140	25	0.91	0	0	0	0	**0**	0.000	0	0	N	Y	y		No	0.000	<0.1	0%	4		100.00	0.00	**0.00**
Averages	**202.50**	**118.50**	**1.00**	**0.00**	**0.00**	**0.25**	**0.00**	**0.25**	**0.00**	**0.00**	**0.00**													

Table 4d & e ***Data recorded for sea trout sampled at Inverianvie in 2025****. All fish taken using a seine net by WRFT team.*

Sample #4: 5th September: no sea trout caught

Sample #5: 25th September

				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	235	78	0.60	0	0	0	0	**0**	0.000	0	0	Y	Y	y	bird beak	No	0.000	>0.3	100%	0	13	0.00	0.00	
2	230	95	0.78	0	0	1	0	**1**	0.011	0	0	N	Y	y		No	0.011	0.2-0.3	50%	0		0.00	0.00	
5	373	546	1.05	0	0	0	0	**0**	0.000	0	1	N	Y	y		No	0.000	0.1-0.2	20%	0		0.00	0.00	
6	287	247	1.04	0	0	0	0	**0**	0.000	0.5	2	N	Y	y		No	0.000	<0.1	0%	13		100.00	0.00	**0.00**
7	395	600	0.97	0	0	0	0	**0**	0.000	2	0	N	Y	y	female; healed dorsal fin	No	0.000							
8	445	853	0.97	0	2	0	0	**2**	0.002	1.5	1	Y	Y	y	female; healed bite on up flank	No	0.002							
9	302	288	1.05	0	0	0	0	**0**	0.000	0	1	Y	Y	y	fish hook damage; bird beak	No	0.000							
10	282	248	1.11	0	2	0	0	**2**	0.008	0	0	Y	Y	y	top of jaw missing; bird beak	No	0.008							
11	281	257	1.16	1	2	0	0	**2**	0.008	0	2	Y	Y	y	top of tail nicked	No	0.008							
12	438	816	0.97	0	0	0	0	**0**	0.000	0.5	1	N	Y	y		No	0.000							
13	435	881	1.07	0	1	0	0	**1**	0.001	2	0	N	Y	y	female; hook damage; healed fi	No	0.001							
14	460	1080	1.11	0	1	0	0	**1**	0.001	1	1	N	Y	y	female; healed fin damage	No	0.001							
15	475	1260	1.18	0	0	0	0	**0**	0.000	1	0	N	Y	y	male; healed fin damage	No	0.000							
Averages	**356.77**	**557.62**	**1.00**	**0.08**	**0.62**	**0.08**	**0.00**	**0.69**	**0.00**	**0.65**	**0.69**													

2.4 Sea lice monitoring discussion

Despite less frequent sampling of sea trout at the Kanaird estuary and fewer fish in 2025 than in 2024, the very high counts of sea lice on three of the small sea trout sampled on 26th May provides evidence of high sea lice infestation pressure affecting wild fish in nearby waters in the spring of 2025.

Anecdotes from local anglers, including photos of sea trout taken in nearby rivers, also indicated high sea lice infestation of wild sea trout in nearby waters in spring 2025.

Although lice levels were low on the sea trout taken at the Inverianvie site close to the mouth of the Little Gruinard River in late September, many of these fish had damage to dorsal fins, indicative of high numbers of attached sea lice earlier in the year. Therefore, there is a possibility that post-smolt salmon from the Little Gruinard River Special Area of Conservation [SAC] for the Atlantic salmon were also subject to high sea lice infestation pressure during the spring of 2025. Post-smolt salmon do not return to freshwater if they become infested with sea lice. If sea lice numbers are too high, post-smolt salmon die (Johnsen et al 2021).

For the second year in succession, Ardmair salmon farm reported on-farm sea lice levels close to or above Code of Good Practice levels in early spring, the most important time of year for protection of wild salmon passing by (Figure 1 and Figure 2). The other farm in the area which reported high counts of sea lice in the spring of 2025 was the Ardessie farm, located >24km away from the River Kanaird estuary. The Ardessie salmon farm has a smaller consented biomass than the Ardmair farm.

Our data and that of previous years indicates that these levels are too high to prevent infestation of sea trout and very likely lethal infestation of post-smolt wild salmon migrating through nearby waters.

High sea lice infestation pressure can affect post-smolt salmon migrating through coastal waters nearby from the rivers Broom, Ullapool and Kanaird, and possibly also the Gruinard and Little Gruinard rivers. Given the international importance of wild salmon populations within the local area, this is an unsatisfactory situation and a step backwards for wild salmon conservation within the local area (rivers flowing into the Wester Ross Marine Protected Area) since before 2022 when on-farm sea lice levels were much lower.

Figure 1: Reported adult female lice counts on farm salmon at the Ardmair salmon farm in 2025. The weeks shaded in pink are the ones which are most important for protection of wild salmon post-smolts migrating through sea areas nearby.

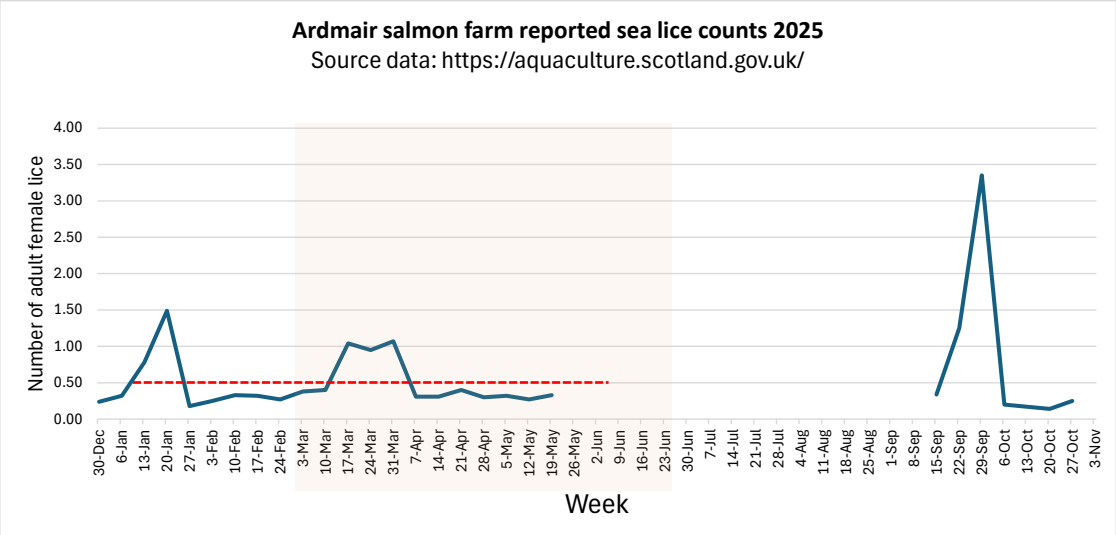


Figure 2. Reported adult female sea lice levels on farm salmon for farms in the Loch Broom – Wester Ross MPA area, Winter – end of Summer 2025. Red colour shading is for figures above the salmon farming industry's Code of Good Practice. Source: https://aquaculture.scotland.gov.uk/csv/ms_sea_lice_current.csv

	Site name			
Week	Ardessie	Ardmair	Corry Farm	Tanera
30/12/2024		0.24	0.00	
06/01/2025		0.32	0.00	
13/01/2025		0.78	0.00	
20/01/2025	0.36	1.49	0.00	
27/01/2025	0.36	0.18	0.00	
03/02/2025	0.24	0.25	0.00	
10/02/2025	0.28	0.33	0.00	
17/02/2025	0.36	0.32	0.00	
24/02/2025	0.36	0.27	0.00	
03/03/2025	0.28	0.38	0.00	
10/03/2025	0.32	0.40	0.00	
17/03/2025	0.27	1.04	0.00	
24/03/2025	0.28	0.95	0.00	
31/03/2025	0.24	1.07	0.02	
07/04/2025	0.24	0.31	0.02	
14/04/2025	0.28	0.31	0.00	
21/04/2025	0.32	0.40	0.10	
28/04/2025	0.32	0.30	0.14	0.00
05/05/2025	0.33	0.32	0.05	
12/05/2025	0.64	0.27	0.06	0.03
19/05/2025	0.44	0.33	0.05	0.00
26/05/2025	0.53		0.05	0.05
02/06/2025	0.58		0.13	0.04
09/06/2025			0.05	0.02
16/06/2025		0.70	0.45	0.00
23/06/2025			0.45	0.00
30/06/2025	0.73		0.95	0.05
07/07/2025			0.06	0.15
14/07/2025			0.08	0.10
21/07/2025			0.49	0.26
28/07/2025			1.15	0.55
04/08/2025				0.75
11/08/2025				0.70
18/08/2025				0.71
25/08/2025				1.18

2.5 Conclusions from sea lice monitoring and recommendations

In May 2025, sea lice levels were too high to safeguard the health of sea trout and very likely some post-smolt salmon in the sea around the Loch Kanaird and outer Loch Broom areas.

The nearby Ardmair salmon farm is the closest potential salmon farm source of sea lice for wild sea trout sampled at the nearby Kanaird wild fish monitoring site.

Published figures for on-farm sea lice counts on the Scotland's Aquaculture website indicate high on-farm adult female sea lice counts on farmed fish at the Ardmair farm during the winter and early spring of 2025, for the second year in succession. Counts of lice at the Ardessie farm were also above Code of Good Practice targets during May 2025.

High sea lice infestation pressure in this area during the spring is also of concern for wild post-smolt salmon migrating from the rivers Kanaird, Ullapool, Lael and Broom, and from the Dundonnell, Gruinard and Little Gruinard rivers.

The 2024 Ardmair EMP Wild fish monitoring report stated:

'To better protect sea trout and migrating salmon smolts in 2025 it is important to maintain much lower levels of sea lice on salmon farms in the area during the winter and early spring of 2025 than reported for this period in 2024 on Scotland's Aquaculture website.'

The same needs to be said again ahead of spring 2026.

If commercial salmon farms are unable to better control sea lice to protect wild fish populations nearby, plans may need to be put in place to reduce on-farm biomass prior to the period when larval sea lice emissions from the farm are likely to infest wild salmon post-smolts passing through nearby waters. A synchronised fallow period starting in early March may be one option?

(below) Sweep netting team, by River Kanaird estuary, 26th May 2025

Part 3. Juvenile fish surveys in the River Kanaird (= River Canaird) and Gruinard River

3.1 Introduction to juvenile fish survey

This part of the report presents the results of an electro-fishing survey of sites in the River Kanaird, Ullapool River, River Broom and Lael and Gruinard River in 2025.

The survey focussed on finding out about the distribution and abundance of juvenile salmon (*Salmo salar*) in the upper part of the catchment area accessible to salmon within the River Kanaird and Ullapool river systems and focussed mostly on sites in core habitat areas of the Lael, Broom and Gruinard rivers. Post-smolt salmon from all these rivers may be vulnerable to infestation by sea lice in nearby coastal waters, reducing rates of marine survival, and subsequent wild salmon egg deposition and genetic diversity within respective salmon populations. Trout (*Salmo trutta*), eel (*Anguilla anguilla*) and minnow (*Phoxinus phoxinus*) were also recorded.

Water levels, weather conditions and other estate activities meant that we were unable to do additional juvenile fish survey days in the Little Gruinard River and in the Gruinard River headwaters above Loch na Sealga, so the results for the Ullapool River and rivers Broom and Lael surveys have been included here instead. Post-smolt salmon from the Ullapool, Lael and Broom rivers must pass through outer Loch Broom, within 3km of the Ardmair salmon farm, so are also vulnerable to sea lice infestation pressures associated with high numbers of sea lice on the Ardmair salmon farm.

3.2 Locations and methods

Six sites were surveyed in the River Kanaird on 28th August; seven sites in the Ullapool River system on 10th September; four sites on rivers Lael and Broom on 3rd September, and six sites in the Gruinard River on 2nd September (all 2025). Locations of electro-fishing sites are shown in Figures 3a, 3b, 3c and 3d.

Sites surveyed on the River Kanaird in 2025 included the same sites fished in 2024. Conditions on the day of survey were more favourable than in 2024, and the river was at a low level. The survey included the sites surveyed as part of a contract to monitor wild fish for a hydropower scheme in the upper River Kanaird; the results are relevant to operation of both the hydro-scheme and to the Ardmair salmon farm EMP.

In the Ullapool River system, three sites were surveyed in the Rhidorroch River above Loch Achall, two in small tributary streams nearby; and one at the top of the Ullapool River near the outflow of Loch Achall.

Two main river sites were surveyed in the River Broom. The river was higher than usual, so numbers of fish are not comparable to the results at these sites in previous years. An additional site was surveyed in tributary burn by the woodturning centre; and one in the nearby River Lael.

Sites surveyed in the Gruinard River were all below Loch na Sealga, plus a site in the Abhainn Loch Ghuibhsachain, about 150m upstream from the confluence with the Gruinard River.

At each site, the survey team fished for a minimum of eight minutes in a standardised way (typically 10 minutes or more), usually covering a wetted area of 80m^2 or more. A one-run, semi-quantitative methodology, following Scottish Fisheries Coordination Centre [SFCC] protocol and NEPS Single Run

protocol, was used to produce Catch Per Unit Effort [CPUE] data and minimum density estimates for juvenile salmon and trout.

Surveys were led by WRFT Biologist Peter Cunningham with assistance from Nic Butler, both of whom have SFCC electrofishing training qualifications, and Nicky Middleton-Jones. A Smith-Root backpack discharging 350-400 volts was used.

All fish were lightly sedated (in eugenol, c. clove oil) and measured to the nearest mm (fork length) and returned to the water following recovery.

Figure 3a. Locations of electrofishing sites in the River Kanaird surveyed on 28th August 2025. The yellow triangle is the location of the Langwell Falls. Base map: OpenStreetMap thank you.

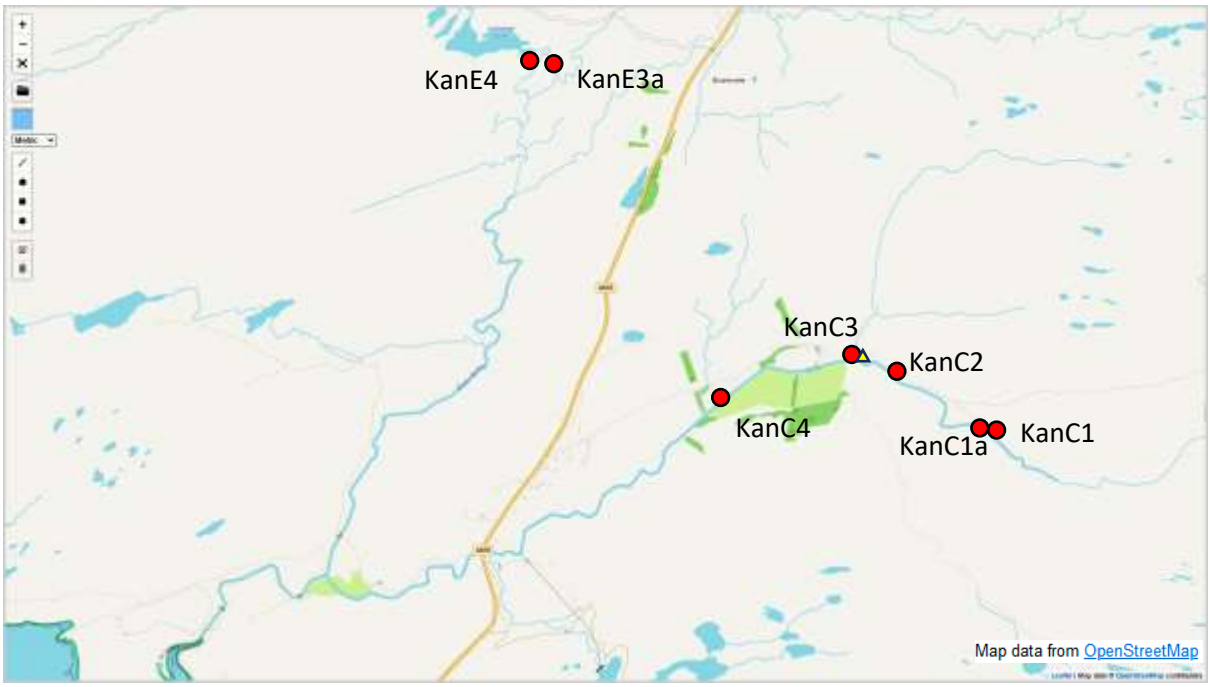


Figure 3b. Locations of electrofishing sites in the Ullapool River surveyed on 10th September 2025. Base map OpenStreetMap thank you.

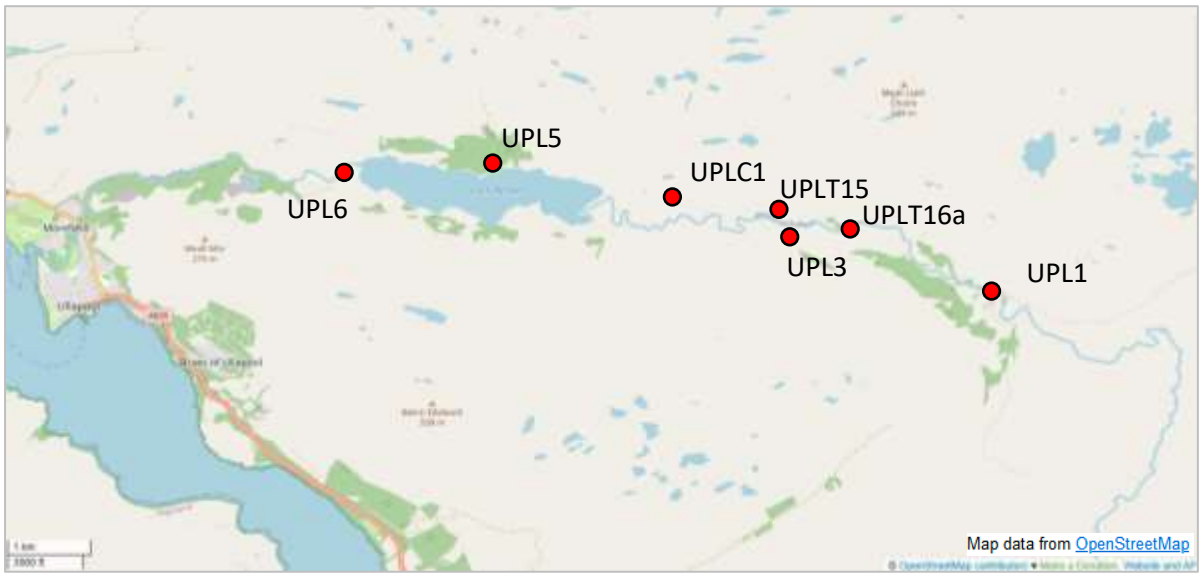


Figure 3c. Locations of electrofishing sites in the River Broom and River Lael surveyed on 3rd September 2025. Base map OpenStreetMap thank you. (note that 'north' is to the left)

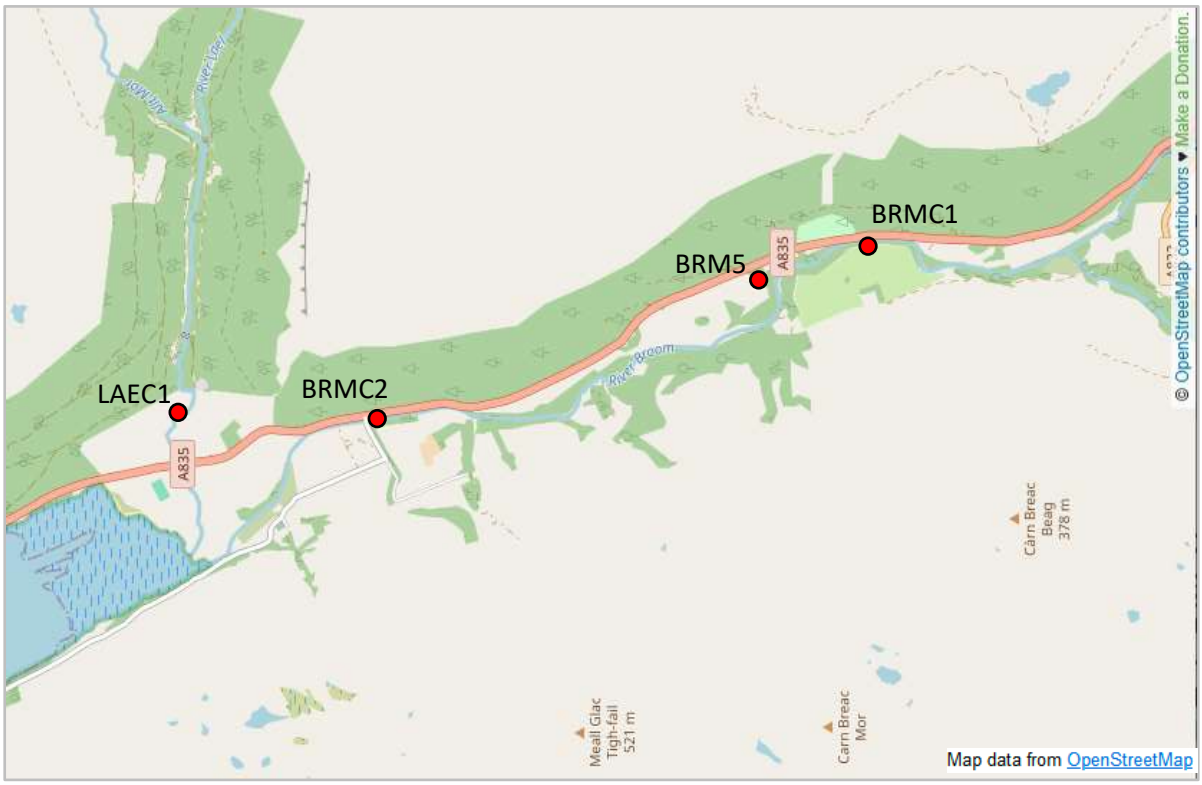
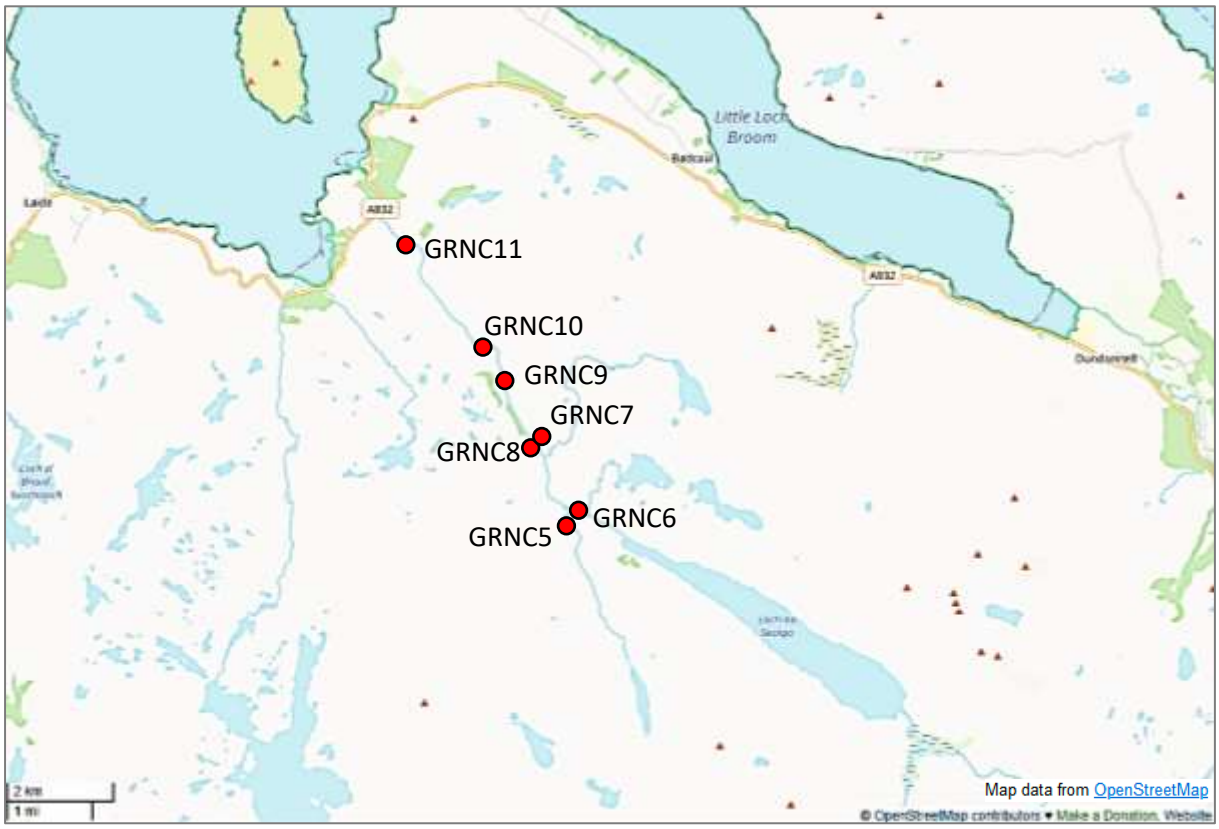


Figure 3d. Locations of electrofishing sites in the Gruinard River surveyed on 2nd September 2025. Base map OpenStreetMap thank you.



3.3 Results

A summary of results can be found in Table 5a (River Kanaird), Table 5b (Ullapool River), Table 5c (Rivers Broom and Lael) and Table 5d (Gruinard River).

Results are presented as numbers of fish caught per minute; minimum fish density estimates (in numbers of fish per m^2) were also obtained for most sites.

3.3.1 River Kanaird (Table 5a)

Water levels were low and conditions were good for electrofishing on the day of survey. Salmon fry were found at the two sites in the upper Runie (KanE3a and KanE4) but only at two of the five sites fished in the upper River Kanaird (KanC3 and KanC4). Above the Langwell falls, no salmon fry were found at any of the three sites surveyed; however large parr were recorded at KanC1a, and KanC2. The large parr at these sites were assumed to be large one-year old fish, based on the size of other fish in the sample.

Below the falls, salmon fry and salmon parr were found at moderate to high CPUE, at numbers indicative of a healthy salmon population in this part of the river.

In the upper Runie, salmon fry were recorded at moderate CPUE in the larger tributary, Allt Liath Doire (KanE3a) but not in the smaller Lochan Dubha burn above a waterfall (KanE4).

The highest densities of trout fry were found at KanC2, KanE3a and KanE4.

3.3.2 Ullapool River (Table 5b)

Conditions were good for this survey. Salmon fry and parr were found at all three sites in the main Rhidorroch River above Loch Achall, and at UPL3 in a tributary burn.

One salmon fry was found in the House burn, and densities of salmon fry were high in core spawning area at the top of the Ullapool River near the outflow of Loch Achall.

3.3.3 River Broom (Table 5c)

Water levels in the main river were higher than anticipated, perhaps due to Hydropower operations further upstream. This made electrofishing less effective than usual, so numbers of fry and parr underestimate numbers present compared to surveys in previous years. Salmon fry and parr were similar in size to those recorded in earlier years.

3.3.4 Gruinard River (Table 5d)

The main river was at a low level, but tributary site (GRNC5) running higher and faster than usual, making e-fishing difficult at this site. High numbers of salmon fry were found at five out of seven sites surveyed in the Gruinard River. Salmon parr were also present at all sites except GRNC10, typically at moderate densities.

Salmon fry were largest at the site furthest upstream (GRNC6) at between 47 and 65mm in length, then smaller at sites further downstream. At the lowest site (GRNC11) salmon fry were between 32mm and 49mm in length.

Juvenile trout were recorded at only one of the six sites surveyed, GRNC6.

Table 5a. Juvenile fish survey results for sites fished in River Kanaird in 2024 and 2025.

Colour coding relates to Wester Ross scales of relative abundance or minimum density estimates for fish: green is for over 2 fish per minute or over 0.200 fish per m^2; yellow, for 1.00 to 1.99 fish per minute or 0.100 to 0.199 fish per m^2; orange for 0.50 to 0.99 fish per minute or 0.050 to 0.099 fish per m^2; and red for 0.01 to 0.49 fish per minute or 0.001 to 0.049 fish per m^2. Further explanation of this colour scheme can be found in Cunningham (2022b) https://www.wrft.org.uk/files/Status%20of%20Wild%20Salmon%20in%20Wester%20Ross%20Report%20for%202021v1Feb22.pdf .

Date	Code	Site	Easting	Northing	conductivity µS	temp °C	time (mins.)	wet area (approx) m2	sal fry number	sal par number	trt fry number	older trout number	sal fry per minute	sal par per minute	trt fry per minute	old trt per minute	sal fry per m^2	sal par per m^2	trt fry per m^2	older trout per m^2	eels	minnows	Comments
11/09/2024	KAN_C1	Glen Cottage	218686	902126	38	10	10	n/r	0	0	0	1	0.00	0.00	0.00	0.10	nr	nr	nr	nr	4		river high - fished edge of channel
11/09/2024	KAN_C4	below Yogi's field	216601	902485	43	10.1	15	n/r	3	5	1	1	0.20	0.33	0.07	0.07	nr	nr	nr	nr	0	2	river high - fished edge of channel
30/09/2024	KAN_E3	Allt Liath Doire	215435	905149	61	8.8	12	100	36	7	5	1	3.00	0.58	0.42	0.08	0.36	0.07	0.05	0.01			
30/09/2024	KAN_E4	Lochan an Dubha burn 300m downstream of loch	215173	905191	45	9.9	6	80	2	2	4	2	0.33	0.33	0.67	0.33	0.03	0.03	0.05	0.03			
30/09/2024	KAN_E5	below main road	214112	901159	85	9.9	10	150	32	9	2	0	3.20	0.90	0.20	0.00	0.21	0.06	0.01	0.00	13		

Date	Code	Site	Easting	Northing	conductivity µS	temp °C	time (mins.)	wet area (approx) m2	sal fry number	sal par number	trt fry number	older trout number	sal fry per minute	sal par per minute	trt fry per minute	old trt per minute	sal fry per m^2	sal par per m^2	trt fry per m^2	older trout per m^2	eels	minnows	Comments
28/08/2025	Kan_C1	up to ford by Glen Cottage	218666	902146	87	16	12	180	0	0	1	0	0.00	0.00	0.08	0.00	0.00	0.00	0.01	0.00	seen		no salmon
28/08/2025	Kan_C1a	up to corner pool and riffle above	218644	902158	87	16	12	200	0	2	1	18	0.00	0.17	0.08	1.50	0.00	0.01	0.01	0.09	seen		sal par 130-133mm
28/08/2025	Kan_C2	over style (above Langwell falls)	217997	902607	88	15.8	14	220	0	8	14	1	0.00	0.57	1.00	0.07	0.00	0.04	0.06	0.00	1		sal par 113-127mm
28/08/2025	Kan_C3	150m downstream of Langwell falls	217600	902755	95	15.9	12	135	22	19	1	0	1.83	1.58	0.08	0.00	0.16	0.14	0.01	0.00	4		sal fry 44-61mm; sal par 79-123mm
28/08/2025	Kan_C4	bottom of field up to ford by gate	216573	902465	96	18	10	180	29	10	0	1	2.90	1.00	0.00	0.10	0.16	0.06	0.00	0.01	5		sal fry 40-55mm; sal par 71-92mm
28/08/2025	Kan_E3a	Runie, Allt Liath Doire around bend	215341	905163	76	16.7	14	180	9	20	12	9	0.64	1.43	0.86	0.64	0.05	0.11	0.07	0.05			sal fry 55-63mm; five hybrids
28/08/2025	Kan_E4	Runie, burn 150m dnstrm from Lochanan Dubha	215198	905241	60	17.5	12	100	0	2	16	1	0.00	0.17	1.33	0.08	0.00	0.02	0.16	0.01		14	no fry; par 80-96mm

Colour scheme for WRFT e-fish results for Wester Ross area relating to fish abundance	
	over 2 fish per minute or over 0.200 fish per m^2
	1.00 to 1.99 fish per minute or 0.100 to 0.199 fish per m^2
	0.50 to 0.99 fish per minute or 0.050 to 0.099 fish per m^2
	0.01 to 0.49 fish per minute or 0.001 to 0.049 fish per m^2.

Table 5b. Juvenile fish survey results for sites fished in Ullapool River in 2025.

Colour coding relates to Wester Ross scales of relative abundance or minimum density estimates for fish: green is for over 2 fish per minute or over 0.200 fish per m^2; yellow, for 1.00 to 1.99 fish per minute or 0.100 to 0.199 fish per m^2; orange for 0.50 to 0.99 fish per minute or 0.050 to 0.099 fish per m^2; and red for 0.01 to 0.49 fish per minute or 0.001 to 0.049 fish per m^2. Further explanation of this colour scheme can be found in Cunningham (2022b) https://www.wrft.org.uk/files/Status%20of%20Wild%20Salmon%20in%20Wester%20Ross%20Report%20for%202021v1Feb22.pdf .

Date	Site code	Site location	OS Grid Ref.		Conduct. (µS)	Temp. (°C)	Time fished (mins)	Wet area (approx.) m^2	Number of fish caught					Fish per minute				Minimum density (fish per m^2)				Comments
			easting	northing					sal fry	sal par	trt fry	older trout	eels	sal fry	sal par	trt fry	older trout	sal fry	sal par	trt fry	older trout	
10/09/2025	UPL1	Rhirorroch R, ford at East Rhidorroch, left channel	223583	893673	82	14.4	13	180	9	35	10	1	1	0.69	2.69	0.77	0.08	0.05	0.19	0.06	0.01	mobile sediment - washout?
10/09/2025	UPLT16a	Rhidorroch R by small field and revetment	222177	894537	76	14.3	14	220	15	11	5	3		1.07	0.79	0.36	0.21	0.07	0.05	0.02	0.01	sal fry 44-54mm; sal par 76-130mm
10/09/2025	UPL3	Rhidorroch River; Allt Coire Cronaidh, usual site	221128	894564	118	13.4	10	80	7	15	19	4	seen	0.70	1.50	1.90	0.40	0.09	0.19	0.24	0.05	sal fry 52-60mm; sal par 70-108mm
10/09/2025	UPL15	Rhodorroch River downstream from burn mouth	221085	894645	83	17.9	10	185	16	7	4	0		1.60	0.70	0.40	0.00	0.09	0.04	0.02	0.00	sal fry 50-61mm
10/09/2025	UPLC1	Allt Dail a' Bhraid below track	220105	894885	134	14.7	11	50	0	5	25	12		0.00	0.45	2.27	1.09	0.00	0.10	0.50	0.24	trt fry 38-63mm
10/09/2025	UPL5	house burn	217627	895325	105	13.3	8	60	1	2	19	0		0.13	0.25	2.38	0.00	0.02	0.03	0.32	0.00	just one salmon fry; trt fry 53-75mm
10/09/2025	UPL6	top of river below ford at old bridge	215897	895337	63	15.6	4	75	20	0	1	0		5.00	0.00	0.25	0.00	0.27	0.00	0.01	0.00	sal fry 45-74mm

Colour scheme for WRFT e-fish results for Wester Ross area relating to fish abundance
over 2 fish per minute or over 0.200 fish per m^2
1.00 to 1.99 fish per minute or 0.100 to 0.199 fish per m^2
0.50 to 0.99 fish per minute or 0.050 to 0.099 fish per m^2
0.01 to 0.49 fish per minute or 0.001 to 0.049 fish per m^2.

Table 5c. Juvenile fish survey results for sites fished in River Broom and River Lael 2025. Water levels in the mainstem river Broom were too high for normal survey of sites at Inverbroom Bridge and Achindreen bridge, so the CPUE figures underestimate juvenile salmon densities compared to previous years.

Colour coding relates to Wester Ross scales of relative abundance or minimum density estimates for fish: green is for over 2 fish per minute or over 0.200 fish per m^2; yellow, for 1.00 to 1.99 fish per minute or 0.100 to 0.199 fish per m^2; orange for 0.50 to 0.99 fish per minute or 0.050 to 0.099 fish per m^2; and red for 0.01 to 0.49 fish per minute or 0.001 to 0.049 fish per m^2. Further explanation of this colour scheme can be found in Cunningham (2022b) https://www.wrft.org.uk/files/Status%20of%20Wild%20Salmon%20in%20Wester%20Ross%20Report%20for%202021v1Feb22.pdf .

Date	Site code	Site location	OS Grid Ref.		Conduct. (µS)	Temp. (°C)	Time fished (mins)	Wet area (approx.) m^2	Number of fish caught					Fish per minute				Minimum density (fish per m^2)				Comments
			easting	northing					sal fry	sal par	trt fry	older trout	eels	sal fry	sal par	trt fry	older trout	sal fry	sal par	trt fry	older trout	
03/09/2025	BRMC1	main river by Achindrean bridge, left side of channel	219527	880560	41	13.7	12	nr	11	6	1	1	1	0.92	0.50	0.08	0.08	nr	nr	nr	nr	river m high; sal fry 60-67m; sal par 92-118mm
03/09/2025	BRM5	Allt a' Bhraigh at woodturning centre	219342	881326	72	13.4	12	100	16	0	11	1	4	1.33	0.00	0.92	0.08	0.16	0.00	0.11	0.01	recent spate and boulders moving
03/09/2025	BRMC2	main river at Inverbroom Bridge	218426	884096	46	16	12	nr	14	10	1	0	5	1.17	0.83	0.08	0.00	nr	nr	nr	nr	river m high, 20 fish missed, sal fry 48-58mm
03/09/2025	LAEC1	between fieldsbelow bank collapse corner	218541	885465	65	12.4	12	150	8	6	13	0	3	0.67	0.50	1.08	0.00	0.05	0.04	0.09	0.00	sal fry 56-65mm

Colour scheme for WRFT e-fish results for Wester Ross area relating to fish abundance
over 2 fish per minute or over 0.200 fish per m^2
1.00 to 1.99 fish per minute or 0.100 to 0.199 fish per m^2
0.50 to 0.99 fish per minute or 0.050 to 0.099 fish per m^2
0.01 to 0.49 fish per minute or 0.001 to 0.049 fish per m^2.

Table 5d. Juvenile fish survey results for the Gruinard River.

Colour coding relates to Wester Ross scales of relative abundance or minimum density estimates for fish: green is for over 2 fish per minute or over 0.200 fish per m^2; yellow, for 1.00 to 1.99 fish per minute or 0.100 to 0.199 fish per m^2; orange for 0.50 to 0.99 fish per minute or 0.050 to 0.099 fish per m^2; and red for 0.01 to 0.49 fish per minute or 0.001 to 0.049 fish per m^2. Further explanation of this colour scheme can be found in Cunningham (2022b) https://www.wrft.org.uk/files/Status%20of%20Wild%20Salmon%20in%20Wester%20Ross%20Report%20for%202021v1Feb22.pdf .

Date	Code	Site	Easting	Northing	conductivity µS	temp °C	time (mins.)	wet area (approx) m2	sal fry number	sal par number	trt fry number	older trout number	sal fry per minute	sal par per minute	trt fry per minute	old trt per minute	sal fry per m^2	sal par per m^2	trt fry per m^2	older trout per m^2	eels	Comments
06/11/2024	GRNC1	Abhainn Srath na Sealga at top of alder wood	208874	878853	49	10.4	10	100	15	22	1	0	1.50	2.20	0.10	0.00	0.15	0.22	0.01	0.00	1	sal fry 40-52mm, sal par 58-92mm
06/11/2024	GRNC2	Allt Eighidh (Eas Ban burn)	209063	878555	58	10.7	8	90	0	23	3	2	0.00	2.88	0.38	0.25	0.00	0.26	0.03	0.02		sal par 64-101mm
06/11/2024	GRNC3	Abhainn Loch an Nid	208599	877462	34	10.9	8	100	2	0	6	10	0.25	0.00	0.75	1.25	0.02	0.00	0.06	0.10		sal fry 73-74mm; trt fry 65-80mm; trt 101-350mm
06/11/2024	GRNC4	Abhainn Loch an Nid	207981	875690	34	10.2	8	75	10	10	0	4	1.25	1.25	0.00	0.50	0.13	0.13	0.00	0.05		sal fry 43-54mm; sal par 94-139mm; spn salmon ~400m ^strm

Date	Code	Site	Easting	Northing	conductivity µS	temp °C	time (mins.)	wet area (approx) m2	sal fry number	sal par number	trt fry number	older trout number	sal fry per minute	sal par per minute	trt fry per minute	old trt per minute	sal fry per m^2	sal par per m^2	trt fry per m^2	older trout per m^2	eels	Comments
02/09/2025	GRNC5	Abhainm L. Ghuibhsachain above culvert	199367	885534	36	14.5	10	90	16	5	0	0	1.60	0.50	0.00	0.00	0.18	0.06	0.00	0.00	1	river medium level sal fry 38-55mm; sal par 68-93mm
02/09/2025	GRNC6	upstream from mouth of A. Loch Ghuibhsachain	199397	885583	37	16.2	12	100	30	19	2	0	2.50	1.58	0.17	0.00	0.30	0.19	0.02	0.00	1	sal fry 47-65mm; sal par 78-116mm
02/09/2025	GRNC7	by island right channel	198852	886825	41	16.2	6	120	17	6	0	0	2.83	1.00	0.00	0.00	0.14	0.05	0.00	0.00	2	sal fry 35-50mm; sal par 63-102mm
02/09/2025	GRNC8	by island, left channel	198852	886825	41	16.2	8	160	26	5	0	0	3.25	0.63	0.00	0.00	0.16	0.03	0.00	0.00	1	sal fry 34-52mm; sal par 69-112mm
02/09/2025	GRNC9	top of beat 2 sign; cobbly run at side of channel	198351	887928	39	16.4	13	nr	18	10	0	0	1.38	0.77	0.00	0.00	nr	nr	nr	nr		sal fry 39-56mm; sal par 68-104mm
02/09/2025	GRNC10	margin of left channel at top of island	189023	888654	38	17.3	8	nr	26	0	0	0	3.25	0.00	0.00	0.00	nr	nr	nr	nr		sal fry 35-57mm; no par
02/09/2025	GRNC11	to of left channel by island	196648	890567	41	16.3	10	85	23	5	0	0	2.30	0.50	0.00	0.00	0.27	0.06	0.00	0.00	6	sal fry 32-49mm; sal par 79-102mm

Colour scheme for WRFT e-fish results for Wester Ross area relating to fish abundance	
	over 2 fish per minute or over 0.200 fish per m^2
	1.00 to 1.99 fish per minute or 0.100 to 0.199 fish per m^2
	0.50 to 0.99 fish per minute or 0.050 to 0.099 fish per m^2
	0.01 to 0.49 fish per minute or 0.001 to 0.049 fish per m^2.

3.4 Discussion of juvenile fish survey

For the purposes of informing the Ardmair salmon farm EMP, important data was collected for the distribution, relative abundance and growth of juvenile salmon in all rivers surveyed. This data demonstrates that juvenile salmon numbers remain at near carrying capacity levels in core parts of the Kanaird, Ullapool River, Broom and Gruinard rivers.

However, there are gaps in the distribution of some year classes, most notably that of salmon fry above the Langwell falls in the upper part of the River Kanaird. Lower numbers recorded at some sites may be indicative of pressures affecting wild salmon recruitment in freshwater (e.g. streambed sediment movement and washout of salmon eggs and alevins since spawning time in November 2024) in addition to the challenges of completing the marine stage of the remarkable wild salmon life cycle.

Four of the sites fished in the Kanaird river have been fished every two years to inform the Langwell hydropower company as a CAR [Controlled Activities Regulations] condition of operation. These results are also of relevance to the Ardmair Salmon Farm EMP as they demonstrate that spawning by salmon above the Langwell falls has been inconsistent in the past ten years. The absence of missing year classes of adult salmon above these complex falls may relate to several factors including operation of the Langwell hydroscheme, reduced rates of marine survival of juvenile salmon from the Kanaird (hence relevance to the EMP), as well as other factors.

Given that there were much higher densities of salmon fry and parr at sites below these falls, the easing of passage to adult salmon over the falls to be able to access a large are of habitat above the falls is one way to address the issue and support the wild salmon population in the upper River Kanaird, and is of relevance to all parties (fisheries proprietor, hydropower company and salmon farm). The falls have been much modified in the past by previous owners of Langwell estate; they are not an entirely a natural feature.

Just two sites were surveyed in the upper River Runie tributary, one in the upper Allt Liath Doire (KanE3a), the other above a waterfall in the Lochan Dubha burn (KanE4) which is also marginal habitat for salmon. Fry numbers at KanE3a were lower than at the nearby site Kan3 in 2024; parr numbers in 2025 were higher than in 2024, suggesting that the 2024 fry year-class was stronger than the 2024 salmon fry year-class. KanE4 is in marginal habitat for juvenile salmon; salmon fry were recorded at this site in 2024 but not in 2025.

The distribution and abundance of wild juvenile salmon within a river system can be affected by many factors both within the freshwater environment and during the marine phase of the wild salmon life-cycle. Pressures are cumulative; those that relate to changing climate are largely outwith the control of local people (we can all do our bit).

It is necessary to re-emphasize the importance of wild salmon populations within the rivers flowing into the Wester Ross MPA. This is an area where high levels of infective stage sea lice in coastal waters during the spring salmon post-smolt migration period can do much harm to otherwise relatively strong wild salmon populations in nearby rivers including the Little Gruinard River Special Area of Conservation [SAC] for Atlantic salmon.

In extreme situations, when sea lice infestation pressure is too high through coastal waters, a large proportion of a post-smolt wild salmon run may be lost at sea. For example, reported rod catches for the River Carron are consistent with such a scenario as having occurred in south Wester Ross in some recent years.

Improved control of sea lice at nearby salmon farms will greatly help prevent a similar scenario for the wild salmon populations in the rivers of northern Wester Ross.

4. Conclusions and recommendations (for discussion)

- Samples of sea trout were obtained at both the Kanaird site and the Inverianvie (Gruinard Bay) site from which to be able to assess sea lice infestation levels.

- Very high numbers of sea lice were recorded on three of the small sea trout in the sample taken at the Kanaird site on 26th May 2025. Although the sample size was small (only seven fish), lice levels were many times higher than the Tarranger et al (2015) 'red' category, indicative of high sea lice infestation pressure in nearby waters.

- Lice levels were low on sea trout taken at the Kanaird site in August and at the Inverianvie (Gruinard bay) site in all five samples.

- However, many of the sea trout in the September sample at Inverianvie had dorsal fin damage indicative of high sea lice infestation earlier in the year.

- To protect migrating wild post-smolt salmon as well as sea trout, it is important to maintain much lower sea lice levels at salmon farms in the area especially during period February to May 2026 than achieved in spring 2024 and spring 2025.

- Control of sea lice on local farms was very likely inadequate to protect wild salmon post-smolts from internationally important Atlantic salmon populations in nearby rivers from mortality caused by sea lice infestation in spring 2025.

- Salmon fry were not recorded in the upper River Kanaird above the Langwell falls, however numbers of juvenile salmon were near normal at sites below the falls. This may relate to several factors, including low rates of marine survival.

- Salmon fry were found at many sites surveyed in the Ullapool river system, River Broom and Gruinard River system downstream from Loch na Sealga.

- Future monitoring should continue to focus on several river systems around the Loch Broom – Wester Ross MPA area to be able to understand whether changes in juvenile salmon distribution and relative abundance occur that relate to sea lice infestation in coastal waters.

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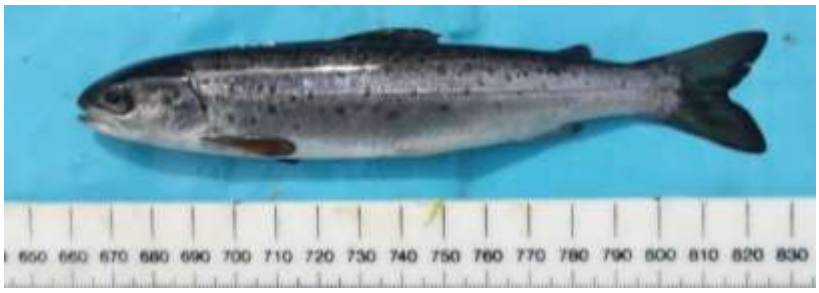
Appendix 1. Sea trout monitoring photos

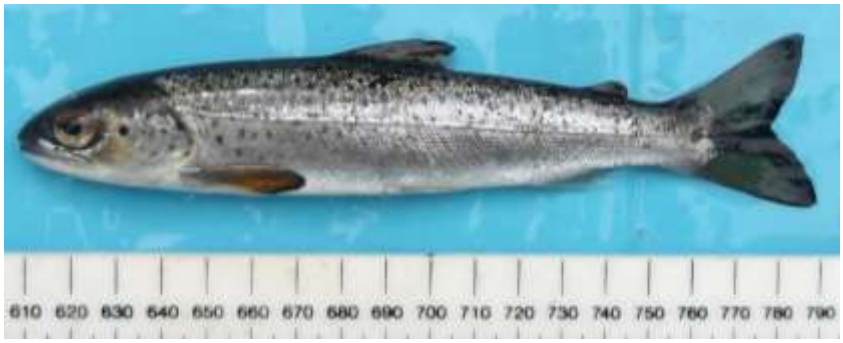
Please note that all fish in photos were lightly sedated before being returned after recovering from anaesthetic

Kanaird Visit # 1: 26th May 25

Sea trout post-smolt, 168mm, Kanaird estuary, 26th May 2025. 42 sea lice counted on this fish.

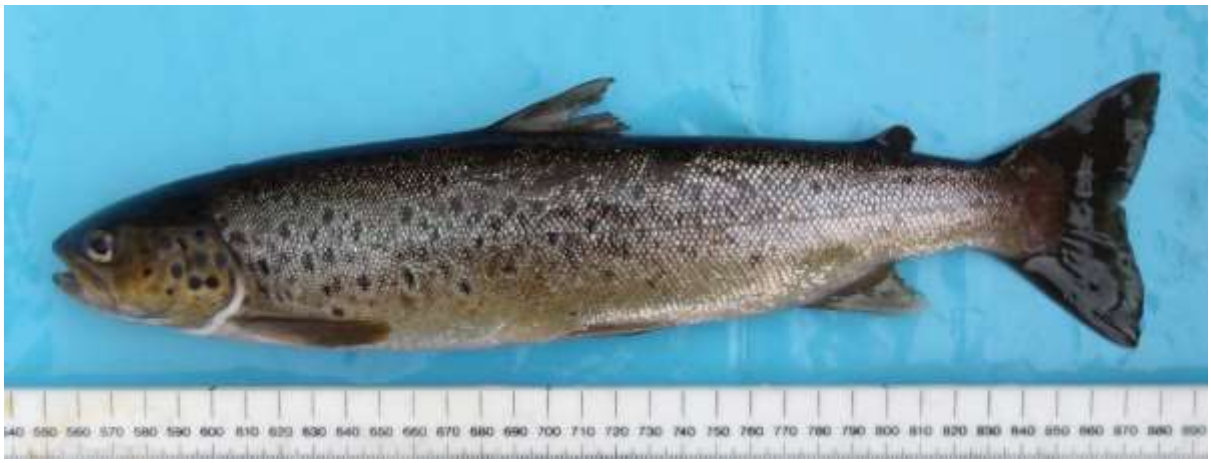


Sea trout post-smolt, 177mm, Kanaird, 26th May 2025. 85 sea lice counted on this fish

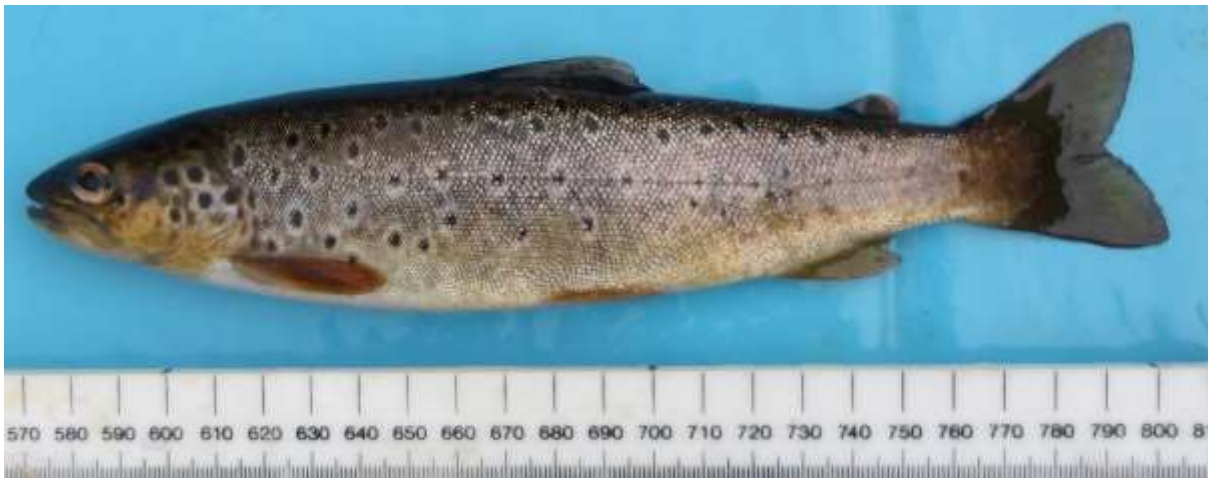


Kanaird visit #2: 8th August 2025

ST 330mm, Kanaird estuary, 8th August 2025. Note dorsal fin damage

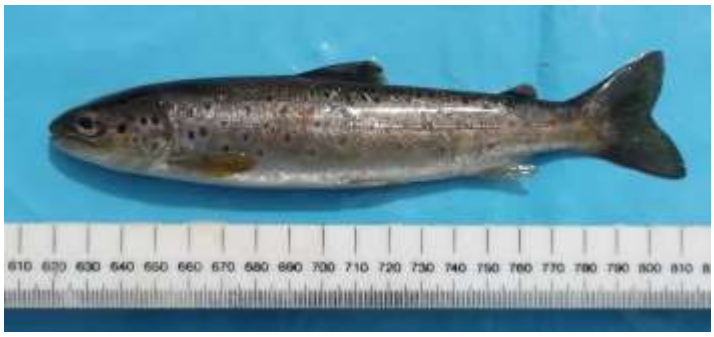


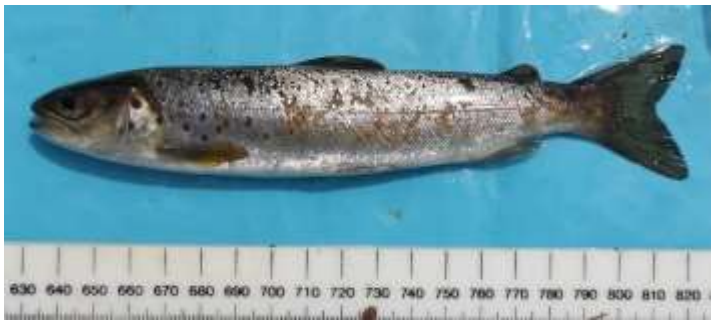
ST 233mm, Kanaird, 8th August 2025. From colouration, this fish is possibly an estuarine trout that had not spent long in saltwater.



Inerianvie visit #1: 30th May 2025

Three small trout 200mm, 197mm, 198mm. The top two are typical post-smolt sea trout, silvery. The bottom one has colouration of a resident brown trout, even though it was taken in the sea off the mouth of the Inverianvie River. No lice.



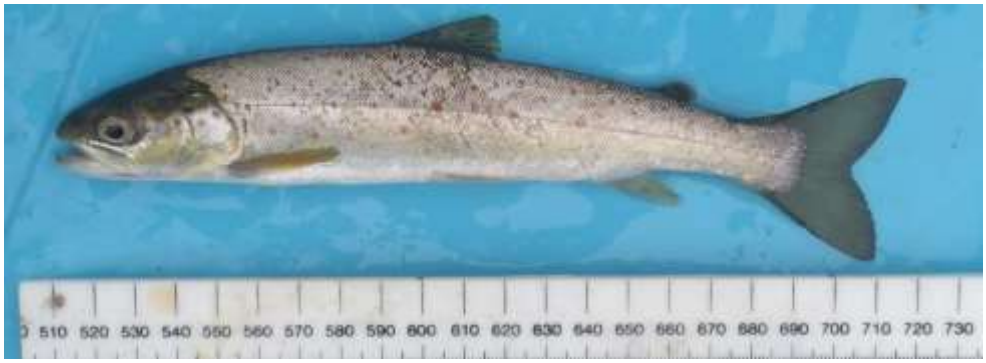


Inverianvie visit #2, 1st July 2025

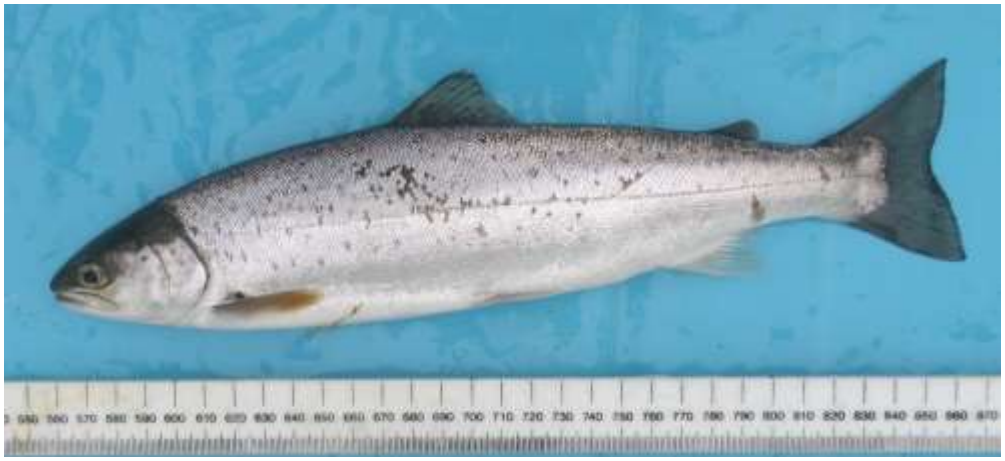
Sea trout 395mm. Note the lice-damaged dorsal fin. Anglers reported seeing sea trout with damaged dorsal fins like this one in the Dundonnell river and waters around Ullapool.

Inverianvie visit #3: 25th July 2025

ST200mm, Inverianvie, 25th July 2025



ST310mm, Inverianvie, 25th July 2025. This one has a healthy undamaged dorsal fin.



Inverianvie visit #4: 4th September 2025. No sea trout caught. Many sandeels and other fish seen.

Inverianvie visit #5: 25th September 2025 (photos by CH)

Sea trout, 435mm, Inverianvie, 25th September 2025. Note lice dam,aged but healed dorsal fin.

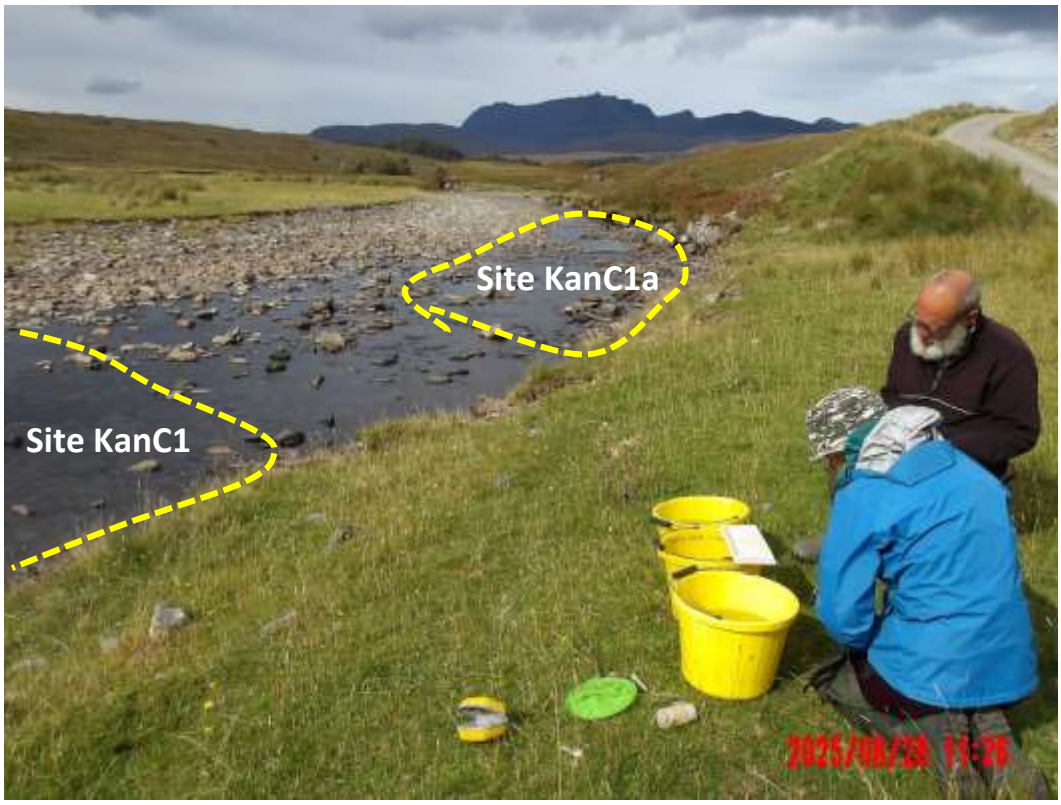
Maturing male and female sea trout, 475mm & 460mm, Inverianvie, 25th September 2025. Note lice-damaged but healed dorsal fins.

Appendix 2: Juvenile fish sampling photos

Site photographs taken on 28th August 2025 (unless stated otherwise).

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

KanC1 and KanC1a



No juvenile salmon were seen or caught at site KanC1 despite a big search. However, two salmon parr were caught at KanC1a, just downstream. The habitat is good for juvenile salmon with a relatively stable streambed and many places for fish to hide. Our catch was dominated by eels; only a minor proportion of those seen were caught as the focus was on finding juvenile salmonids.

(below) Salmon parr caught at site KanC1a approx. 50m downstream of site KanC1 (see photo above)

Site KanC2

The streambed and morphology of this site have changed in past 10 years with sediment movement during spate flows; and repositioning. It still provides good habitat for juvenile salmonids.

(below) salmon parr [left], putative trout x salmon hybrid [middle] and trout parr [right] from the upper River Kanaird at site KanC2 on 28th August 2025

Site KanC3

below the falls, on 28th August 2025. Habitat is ideal for salmon parr here with large slabby cobbles and boulders, with many spaces beneath for fish to hide.

Three year-classes of juvenile salmon from site KanC3 below Langwell falls on 24th August 2023. Fish sizes at this site were similar to these ones on 28 August 2025

Site KanC4

28th August 2025

The pictures below are from this site in 2023. Note that the river channel has subsequently moved from near the right bank towards the left bank (shown in pictures above taken in 2025) as a result of bedload sediment deposition.

Nic Butler, Peter Cunningham in the river . . . Yogi (the bull) and other onlookers at site Kan4 on 24th August 2023.

Site KanE3

Processing fish from this site

Possible trout x salmon hybrid below a salmon parr from this site

Site KanE4 Mostly minnows and trout fry here

Juvenile fish survey Ullapool River headwaters, 10th September 2025 site photos and some fish

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

UPL1 Rhidorroch River at East Rhidorroch

UPLT16a Rhidorroch River by revetment

UPL3 Allt Coire Cronaidh about 100m upstream from confluence with Rhidorroch River

UPLT14a Rhidorroch River 100m downstream from confluence of Allt Coire Cronaidh

UPLC1. This little burn is too small for adult salmon to spawn in, however salmon parr have been found here in previous years – and again in 2025.

UPL5 Rhidorroch House burn 50m upstream from Loch Achall

UPL6 Ullapool River just downstream from location of old bridge at Loch Achall outflow.

Juvenile fish survey of River Broom and River Lael, 3rd September 2025 site photos and some fish

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

LAEC1 River Lael downstream of bank collapse between fields

BRMC1a River Broom left side of channel by Achindrean bridge

BRM5 Allt a' Bhraigh by woodturning centre

BRMC2 River Broom 60m upstream from Inverbroom Bridge

Juvenile fish survey Gruinard River headwaters, 2nd September 2025 site photos and some fish

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

GRNC5 Allt Loch Ghuibhsachain; juvenile salmon from this site

GRNC6 Gruinard River – looking downstream and upstream over site.

GRNC8 (near side . . .) and GRNC7 (far side of island). The water was shallow enough here for effective e-fishing of the whole channel width on both sides of the island.

GRNC7

GRNC8

GRNC9 – fished up the side of the channel here in water <30cm deep

GRNC10 – with salmon fry from this site. Fished up the side of the channel here in water <30cm deep. Most of the fry were in weed beds close to the bank. They are very small! No parr were caught at this site; the streambed habitat may have been unsuitable with little cover and parr swam away from efisher, note that it is glide habitat so not ideal parr habitat.

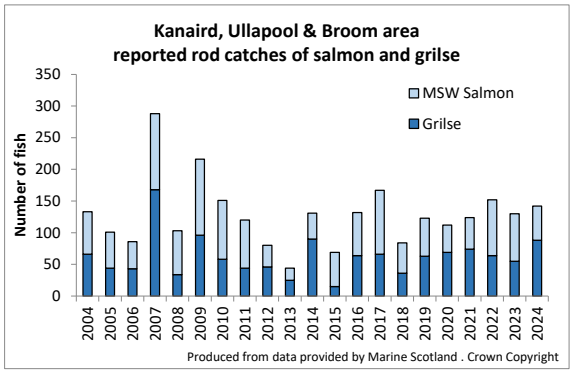
GRNC11 – lowest site by islands (left). Salmon fry were very small here (below right).

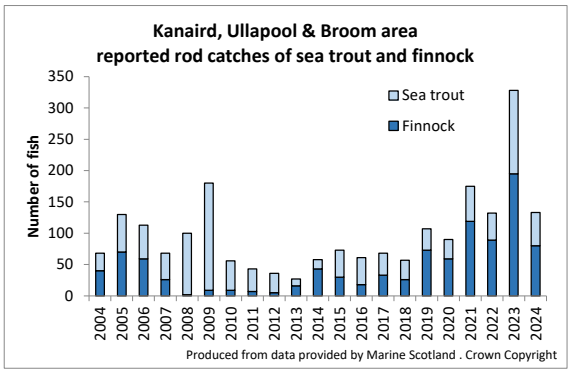
Appendix 3. Reported rod catches of salmon and sea trout for nearby rivers

Graphs for rod catches of salmon and sea trout for the main rivers around the Ardmair salmon farm are shown below. From data published by the Marine Directorate of the Scottish Government via links at https://marine.gov.scot/data/marine-scotland-salmon-and-sea-trout-catches-salmon-district-shinyapp . Rod catch data for 2025 season is likely to be published in spring 2026.

Salmon **Sea trout**

1. North WR: River Kanaird salmon catch was higher in 2024 than in 2023 offsetting lower catches in other rivers in 2024.





2. Central WR: Gruinard salmon catch was 1/5 of recorded catch in 2021. Ewe salmon catch was similar to 2023.