

Sea trout sample, Flowerdale, Loch Gairloch, 27th April 2017. Summary report by Peter Cunningham, info@wrft.org.uk

Lice counts by Peter Cunningham were made in poor light; anaesthetised fish were held under water. Please see photos for some examples on subsequent pages of this report. Team: 7 other helpers. Weather: light north-westerly breeze; rain. Sweep netting at Flowerdale has been supported by Wester Ross Area Salmon Fisheries Board and the Scottish Government.

No.	Location	Date	Method	Fish	length (mm)	weight (g)	condition factor	estimated weight (g) ¹	<i>Lepeophtheirus salmonis</i>				Dorsal fin damage	Lice spots	<i>Cryptocotyle</i> sp. (spots per cm ² of tail fin)	Predator damage	Photo	Comments	
									Copepodid & Chalmus	Pre-adult & adult	Ovigerous females	Total L. s							lice per (g) ²
1	Flowerdale, Loch Gairloch	27-Apr-17	Sweep Net	Sea trout	430	672	0.845		150	22	2	174	0.26	2	Yes	3	bird	Y	behind dorsal
2	Flowerdale, Loch Gairloch	27-Apr-17	Sweep Net	Sea trout	376	495	0.931		130	5	1	136	0.27	1	Yes	1	scrape on right flank	Y	fem
3	Flowerdale, Loch Gairloch	27-Apr-17	Sweep Net	Sea trout	353	451	1.025		65	3	3	71	0.16	1	Yes	0	left flank	Y	fem
4	Flowerdale, Loch Gairloch	27-Apr-17	Sweep Net	Sea trout	325	313	0.912		30	1	1	32	0.10	0.5	Yes	8	N	Y	male
5	Flowerdale, Loch Gairloch	27-Apr-17	Sweep Net	Sea trout	385	416	0.729		170	0	0	170	0.41	1	Yes	0	N	Y	fem
6	Flowerdale, Loch Gairloch	27-Apr-17	Sweep Net	Sea trout	340	358	0.911		40	0	0	40	0.11	1	Yes	20	N	Y	fem
7	Flowerdale, Loch Gairloch	27-Apr-17	Sweep Net	Sea trout	307	236	0.816		40	0	0	40	0.17	0	Yes	0	tail bird	Y	?F
8	Flowerdale, Loch Gairloch	27-Apr-17	Sweep Net	Sea trout	330	300	0.835		70	0	0	70	0.23	0.5	Yes	0	N	Y	?F
9	Flowerdale, Loch Gairloch	27-Apr-17	Sweep Net	Sea trout	322	322	0.964		40	0	0	40	0.12	0	Yes	0	bird tail	Y	?
10	Flowerdale, Loch Gairloch	27-Apr-17	Sweep Net	Sea trout	300	230	0.852		45	0	0	45	0.20	1	Yes	1	N	Y	fem
11	Flowerdale, Loch Gairloch	27-Apr-17	Sweep Net	Sea trout	332	300	0.820		100	2	1	103	0.34	1	Yes	0	old	Y	
12	Flowerdale, Loch Gairloch	27-Apr-17	Sweep Net	Sea trout	344	362	0.889		93	4	0	97	0.27	1	Yes	4	old	Y	
13	Flowerdale, Loch Gairloch	27-Apr-17	Sweep Net	Sea trout	308	271	0.928		130	10	1	141	0.52	1	Yes	1	0	Y	damage photo
14	Flowerdale, Loch Gairloch	27-Apr-17	Sweep Net	Sea trout	270	nr		223	120	2	2	124	0.56	2	Yes	1	0	Y	
15	Flowerdale, Loch Gairloch	27-Apr-17	Sweep Net	Sea trout	348	nr		478	200	7	0	207	0.43	0	Yes	0	0	Y	?kelt
16	Flowerdale, Loch Gairloch	27-Apr-17	Sweep Net	Sea trout	298	nr		300	90	4	1	95	0.32	1	Yes	0	0	Y	
17	Flowerdale, Loch Gairloch	27-Apr-17	Sweep Net	Sea trout	290	nr		277	100	5	0	105	0.38	0	Yes	0	0	Y	close up photo
18	Flowerdale, Loch Gairloch	27-Apr-17	Sweep Net	Sea trout	300	nr		306	220	20	0	240	0.78	0	Yes	5	old	Y	bird
19	Flowerdale, Loch Gairloch	27-Apr-17	Sweep Net	Sea trout	280	nr		249	100	0	0	100	0.40	0	Yes	0	0	Y	
20	Flowerdale, Loch Gairloch	27-Apr-17	Sweep Net	Sea trout	279	nr		246	110	0	0	110	0.45	0	Yes	0	old bird	Y	
21	Flowerdale, Loch Gairloch	27-Apr-17	Sweep Net	Sea trout	260	nr		199	15	1	0	16	0.08	0	Yes	0	0	Y	
22	Flowerdale, Loch Gairloch	27-Apr-17	Sweep Net	Sea trout	253	nr		184	50	0	0	50	0.27	0	Yes	0	0	Y	
23	Flowerdale, Loch Gairloch	27-Apr-17	Sweep Net	Sea trout	260	nr		199	55	0	0	55	0.28	0	Yes	3	0	Y	
24	Flowerdale, Loch Gairloch	27-Apr-17	Sweep Net	Sea trout	260	nr		199	140	0	0	140	0.70	0	Yes	1	0	Y	
25	Flowerdale, Loch Gairloch	27-Apr-17	Sweep Net	Sea trout	260	nr		199	340	0	0	340	1.70	0	Yes	2	0	Y	vry thin
26	Flowerdale, Loch Gairloch	27-Apr-17	Sweep Net	Sea trout	291	nr		280	120	2	0	122	0.44	0	Yes	2	0	Y	very thin male kelt
27	Flowerdale, Loch Gairloch	27-Apr-17	Sweep Net	Sea trout	260	nr		199	45	1	0	46	0.23	0	Yes	0	0	Y	
28	Flowerdale, Loch Gairloch	27-Apr-17	Sweep Net	Sea trout	236	nr		149	50	1	0	51	0.34	0	Yes	0	0	Y	spotty
29	Flowerdale, Loch Gairloch	27-Apr-17	Sweep Net	Sea trout	248	nr		173	90	1	0	91	0.53	0	Yes	1	0	Y	pot belly
30	Flowerdale, Loch Gairloch	27-Apr-17	Sweep Net	Sea trout	228	nr		134	50	2	0	52	0.39	0	Yes	2	0	Y	
31	Flowerdale, Loch Gairloch	27-Apr-17	Sweep Net	Sea trout	218	nr		118	20	0	0	20	0.17	0	Yes	0	0	Y	sunshine
32	Flowerdale, Loch Gairloch	27-Apr-17	Sweep Net	Sea trout	240	nr		157	16	0	0	16	0.10	0	Yes	0	yes old tail	Y	female bronze cheeks
				Averages	297.84		0.88		94.81	2.91	0.38	98.09		0.44		1.72			

Flowerdale, Loch Gairloch	42853	Sweep Net	Flounder	325
Flowerdale, Loch Gairloch	42854	Sweep Net	Flounder	315
Flowerdale, Loch Gairloch	42855	Sweep Net	15sp Sticklbk	145
Flowerdale, Loch Gairloch	42856	Sweep Net	15sp Sticklbk	130
Flowerdale, Loch Gairloch	42857	Sweep Net	15sp Sticklbk	151

Notes:

¹ For fish which were not weighed, an estimated weight has been obtained based on length, using the average condition factor of 0.88 for the 13 fish in the sample which were weighed.

² These figures can be compared with those provided in Taranger *et al* (2014) to categorise into groups according to likelihood of mortality or premature return to freshwater,

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 estimated 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.

For larger salmonids (over 150g), Taranger *et al* (2014) assumes that lice-related mortality will be 100% in the group if they have 0.15 lice per g fish weight; 75% for lice infections between 0.1 and 0.15 lice per g fish weight, 50% for lice infections between 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.

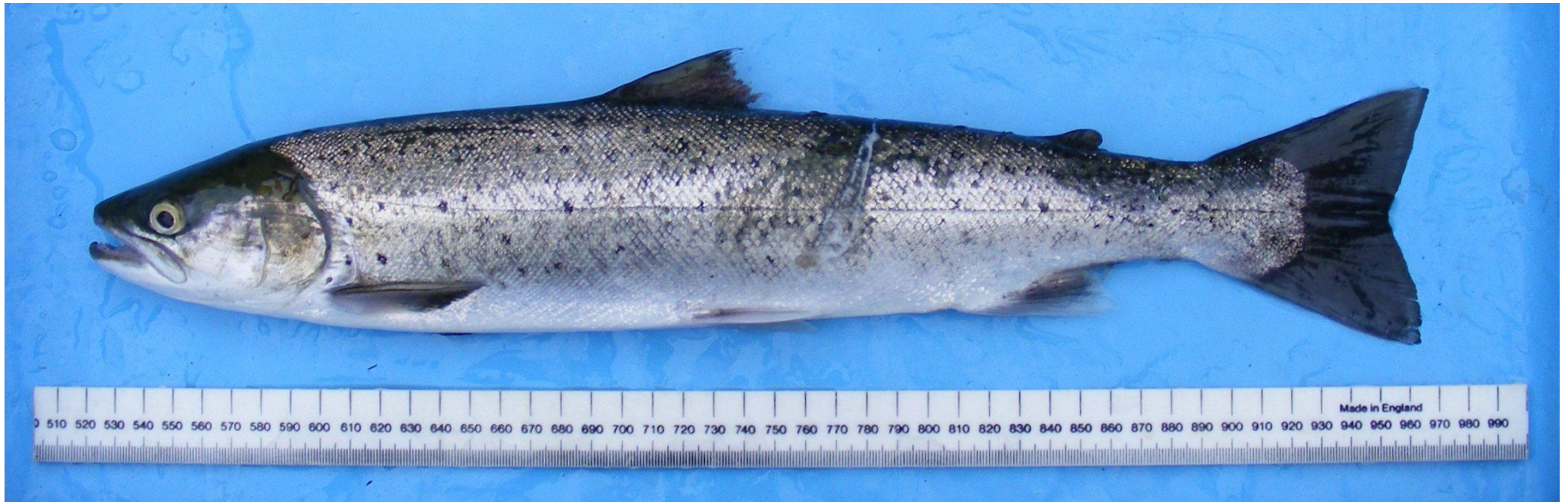
For further discussion and assessment of risk, please see Taranger *et al* (2014)

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.

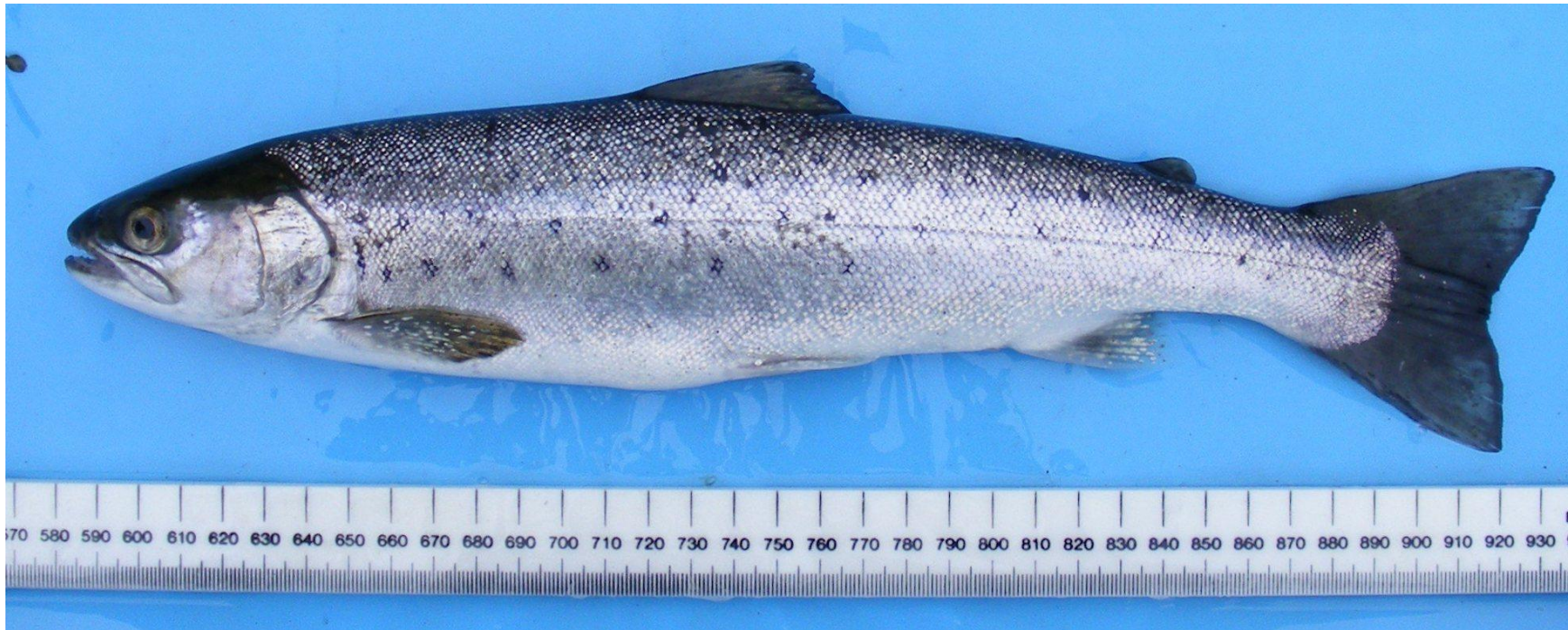
Some photos of sea trout caught in Flowerdale estuary, Loch Gairloch, 27th April 2017.

Fish number 1: ST430mm, 672g, condition factor 0.845; carrying 150 copepodid and chalimus lice; 22 adult and preadult lice and 2 ovigerous females. Note bird damage (on both sides of fish). Dorsal fin damage 2 (over 1/3 of dorsal fin damaged). This was the largest fish caught.



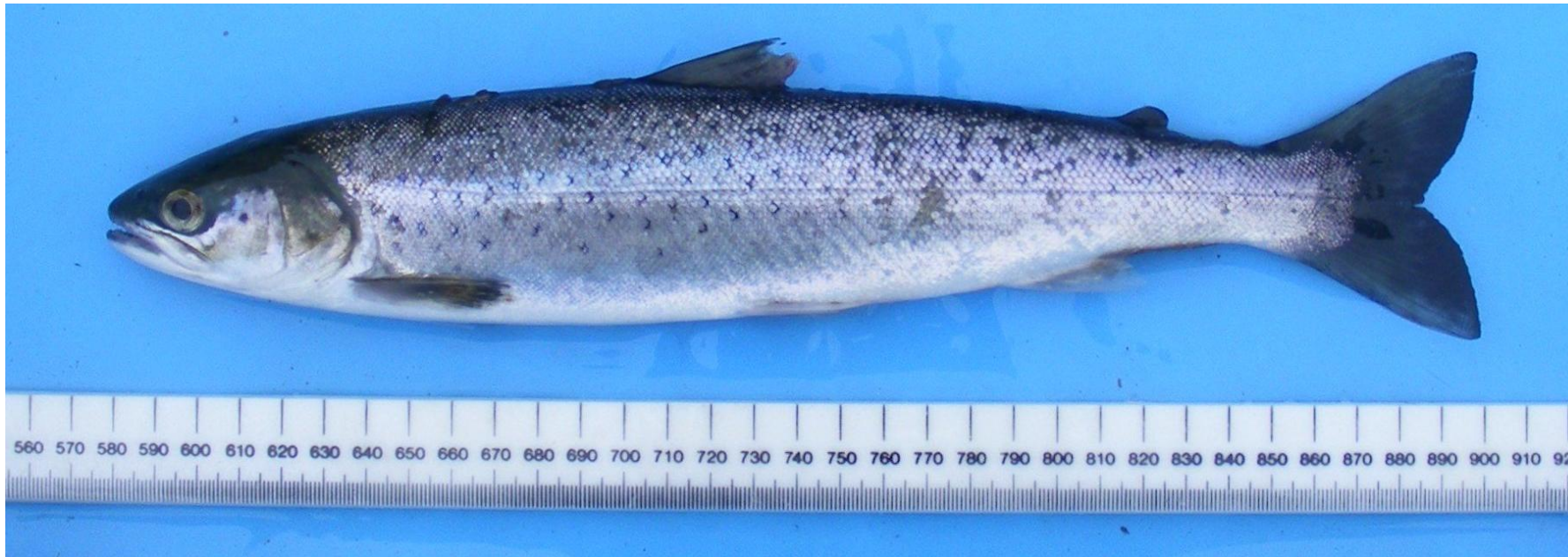
Some photos of sea trout caught in Flowerdale estuary, Loch Gairloch, 27th April 2017.

Fish number 6: ST340mm, 358g, condition factor 0.911; carrying 40 copepodid and chalimus lice. This fish had the highest densities of *Cryptocotyle ligua*, which can be seen on the sides of the fish and pelvic fins in the photo below.



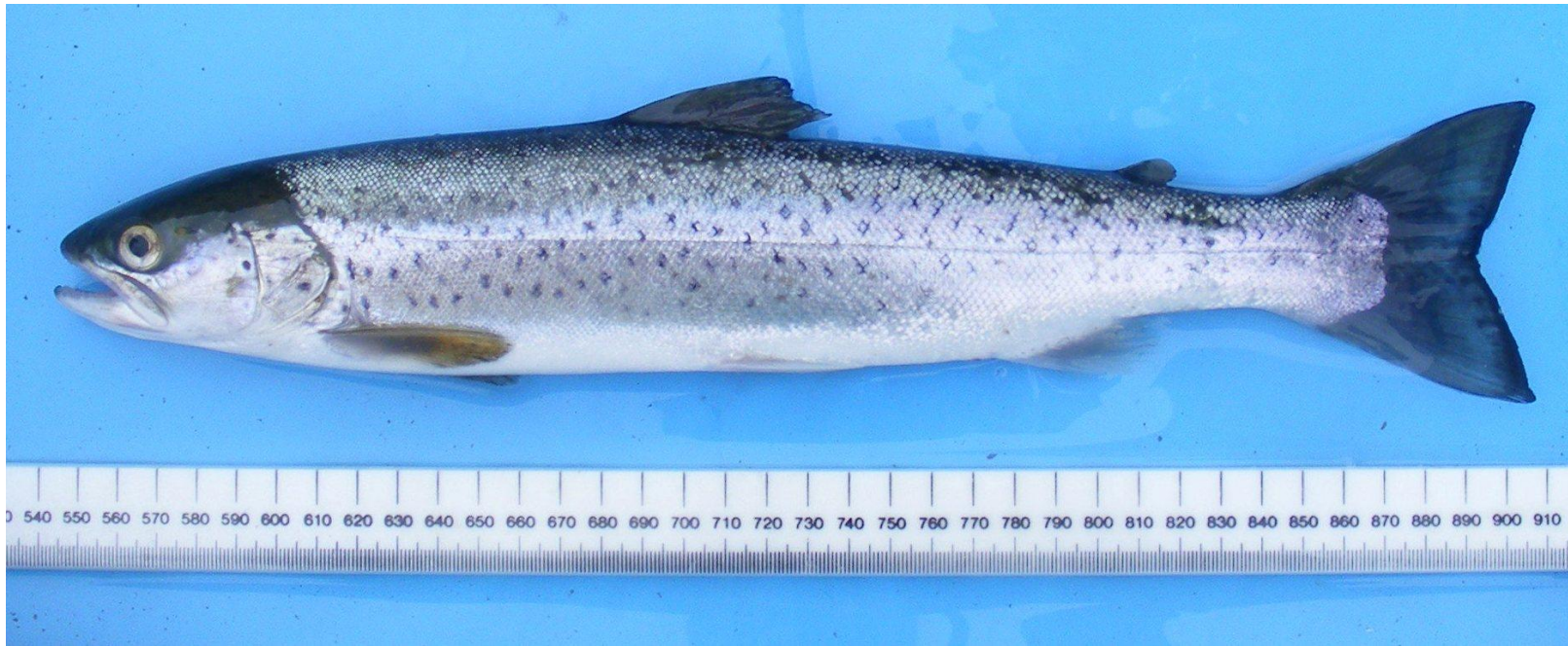
Some photos of sea trout caught in Flowerdale estuary, Loch Gairloch, 27th April 2017.

Fish number 13: ST308mm, 271g, condition factor 0.928; carrying 130 copepodid and chalimus lice, 10 adult and preadult lice and 1 ovigerous female louse; dorsal fin damage 2 (over 1/3 of dorsal fin damaged). Note raw ulceration behind ventral fin.



Some photos of sea trout caught in Flowerdale estuary, Loch Gairloch, 27th April 2017.

Fish number 15. ST348mm (weight not recorded); 200 copepodid and chalimus lice, 7 preadult and adult lice, 0 ovigerous female lice; dorsal fin damage 0.5.



Some photos of sea trout caught in Flowerdale estuary, Loch Gairloch, 27th April 2017.

Fish number 25: ST260mm (weight not recorded); 340 copepodid and chalimus lice, 0 preadult and adult lice, 0 ovigerous female lice, dorsal fin damage 0.5. 'very thin'

