

<b>Location:</b>	Flowerdale Estuary	<b>Aim:</b> to sample overwintered finnock and sea trout as in previous years.
<b>Date:</b>	30-Apr-21	<b>Time:</b> net in about 14:30; low tide 16:10 ish
<b>*Counts:</b>	Peter Cunningham	
<b>Team:</b>	8 volunteer helpers (from 4 other local family groups); social distancing was maintained as much as possible.	
<b>Weather:</b>	bright and sunny. Cold, stayed dry; light NE breeze.	<b>Salinity:</b> variable with Flowerdale burn flowing through sweep netting area, but also marine animals (e.g. 15 spined-stickebacks in catch)
<b>Other notes:</b>	Just one sweep when top of shingle by stones already exposed. So we had to go quite quickly! Sweep netting area cleared of some sticks and stones (potential snags) 3 days before sweep netting. In addition 29 sea trout smolts (all < 200mm) returned without processing; assumed to be recently descended smolts that had not been exposed to marine sea lice infestation pressure. Too early in year to do post-smolt sampling. Lice numbers on larger sea trout possibly higher earlier in month given high dorsal fin damage scores (and scarring). A bit too late in the month to get just overwintered finnock and sea trout; rather too many small smolts in catch. Sea trout seen jumping in estuary occasionally on days before and following sweep. Is this behaviour sea lice infestation related?	

No.	Location	Date	Method	Fish	length (mm)	weight (g)	condition factor	Lepeophtheirus salmonis					Dorsal fin damage <sup>2</sup>	Cryptocotyle sp. (spots per cm <sup>2</sup> of tail fin)	Predator damage	Photo	Scale sample	Comments
								Copepodid & Chalimus	Pre-adult & adult	Ovigerous females	Total L. s	lice per (g) <sup>1</sup>						
1	Flowerdale estuary	30-Apr-21	Sweep Net	sea trout	480	1015	0.92	50	5	14	69	0.068	2	1	n	Y	Y	
2	Flowerdale estuary	30-Apr-21	Sweep Net	sea trout	465	870	0.87	50	8	27	85	0.098	2	20	n	Y	Y	
3	Flowerdale estuary	30-Apr-21	Sweep Net	sea trout	455	920	0.98	88	4	7	99	0.108	1	0	n	Y	Y	
4	Flowerdale estuary	30-Apr-21	Sweep Net	sea trout	355	446	1.00	104	15	12	131	0.294	2	10	Y	Y	Y	split tail
5	Flowerdale estuary	30-Apr-21	Sweep Net	sea trout	355	380	0.85	170	1	0	171	0.450	0	0	Y	Y	Y	scar on left flank
6	Flowerdale estuary	30-Apr-21	Sweep Net	sea trout	314	235	0.76	20	0	4	24	0.102	1	0	n	Y	Y	ex scale loss and regrowth
7	Flowerdale estuary	30-Apr-21	Sweep Net	sea trout	258	140	0.82	12	3	1	16	0.114	1	10	y	Y	Y	old scar; light scale loss
8	Flowerdale estuary	30-Apr-21	Sweep Net	sea trout	455	730	0.77	800	10	8	818	1.121	2	4	n	Y	Y	
9	Flowerdale estuary	30-Apr-21	Sweep Net	sea trout	520	1345	0.96	0	2	2	4	0.003	1	25	n	Y	Y	
10	Flowerdale estuary	30-Apr-21	Sweep Net	sea trout	525	1295	0.89	50	3	2	55	0.042	2	20	n	Y	Y	
11	Flowerdale estuary	30-Apr-21	Sweep Net	sea trout	445	780	0.89	40	2	2	44	0.056	1	2	n	Y	Y	
12	Flowerdale estuary	30-Apr-21	Sweep Net	sea trout	330	325	0.90	12	2	0	14	0.043	1	1	n	Y	Y	
13	Flowerdale estuary	30-Apr-21	Sweep Net	sea trout	290	208	0.85	20	1	0	21	0.101	1	5	n	Y	Y	
14	Flowerdale estuary	30-Apr-21	Sweep Net	sea trout	297	236	0.90	100	0	0	100	0.424	1	3	n	Y	Y	
15	Flowerdale estuary	30-Apr-21	Sweep Net	sea trout	392	490	0.81	40	0	3	43	0.088	1.2	1	y	Y	Y	beak scar lower left flank
16	Flowerdale estuary	30-Apr-21	Sweep Net	sea trout	368	430	0.86	14	2	2	18	0.042	1	0	y	y	Y	photo both sides of beak
17	Flowerdale estuary	30-Apr-21	Sweep Net	sea trout	360	350	0.75	30	2	2	34	0.097	2	0	y	Y	Y	damage to head
18	Flowerdale estuary	30-Apr-21	Sweep Net	sea trout	301	196	0.72	40	4	3	47	0.240	2	15	n	y	Y	scale loss both sides
19	Flowerdale estuary	30-Apr-21	Sweep Net	sea trout	240	70	0.51	60	0	0	60	0.857	1	0	n	Y	Y	very thin
20	Flowerdale estuary	30-Apr-21	Sweep Net	sea trout	246	103	0.69	14	2	0	16	0.155	0.5	0	n	y	Y	
21	Flowerdale estuary	30-Apr-21	Sweep Net	sea trout	235	78	0.60	36	0	0	36	0.462	1	0	n	y	Y	
22	Flowerdale estuary	30-Apr-21	Sweep Net	sea trout	235	103	0.79	0	0	0	0	0.000	0	2	n	y	Y	
23	Flowerdale estuary	30-Apr-21	Sweep Net	sea trout	223	84	0.76	34	0	0	34	0.405	1	1	n	y	Y	mild scale damage
24	Flowerdale estuary	30-Apr-21	Sweep Net	sea trout	246	110	0.74	50	1	0	51	0.464	1	0	n	Y	Y	
					<b>Averages</b>	<b>349.58</b>	<b>455.79</b>	<b>0.82</b>	<b>76.42</b>	<b>2.79</b>	<b>3.71</b>	<b>82.92</b>	<b>0.24</b>	<b>1.2</b>	<b>5</b>			

total lice	1990
number of fish	24
number infested	23
prevalence	96%
abundance	82.92
intensity	86.52
fish with >0.3 lice per g	7
fish with >0.3 lice per g	29%

**Notes:**  
<sup>1</sup> 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 they 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 150 g), 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](https://www.researchgate.net/publication/266672998_Risk_assessment_of_the_environmental_impact_of_Norwegian_Atlantic_salmon_farming)

colour code	
	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

<sup>2</sup>Dorsal fin damage scores: '1' up to a third of fin damaged (e.g. eroded away); '2' between a third and two thirds of the fin damaged; '3' over two thirds of fin damaged.