The following supplement accompanies the article

Energetically efficient behaviour may be common in biology, but it is not universal: a test of selective tidal stream transport in a poor swimmer

Sergio Silva*, Consuelo Macaya-Solis, Martyn C. Lucas

*Corresponding author: sergio.silva@usc.es

Marine Ecology Progress Series 584: 161–174 (2017)

Table S1. Detail of acoustic tagged lamprey. E = released at ebbing tide; F = released at flooding tide.

Release time-date	Acoustic I.D.	Length (mm)	Weight (g)	Tag burden (%)	Tide	Route
24/11/2015 19:43	347	382	95	2.8	E	Ouse
24/11/2015 19:43	365	398	95	2.8	E	Ouse
25/11/2015 16:05	340	385	101	2.7	F	Not detected
25/11/2015 20:08	379	380	89	3.0	E	Ouse (likely predated)
25/11/2015 20:08	378	382	91	3.0	E	Ouse
29/11/2015 11:55	384	409	110	2.5	E	Ouse
29/11/2015 12:00	359	389	102	2.6	E	Ouse
29/11/2015 18:39	389	386	94	2.9	F	Ouse
29/11/2015 18:44	374	402	104	2.6	F	Ouse
29/11/2015 23:23	341	404	105	2.6	E	Ouse
30/11/2015 11:52	343	442	155	1.7	E	Derwent
30/11/2015 11:57	344	419	120	2.3	E	Derwent
30/11/2015 19:05	342	401	89	3.0	F	Ouse
30/11/2015 19:10	345	398	95	2.8	F	Derwent
01/12/2015 12:18	348	402	88	3.1	E	Derwent
01/12/2015 12:23	349	396	103	2.6	E	Derwent
01/12/2015 19:33	346	414	103	2.6	F	Ouse
11/12/2015 17:12	350	383	101	2.7	F	Ouse
12/12/2015 17:48	351	408	115	2.3	F	Derwent
12/12/2015 17:53	352	429	145	1.9	F	Ouse
12/12/2015 21:07	354	390	111	2.4	E	Ouse
12/12/2015 21:12	355	406	104	2.6	E	Ouse
12/12/2015 21:17	353	385	99	2.7	E	Derwent
13/12/2015 09:49	356	388	92	2.9	E	Derwent
13/12/2015 09:54	358	385	93	2.9	E	Derwent
13/12/2015 09:59	357	391	94	2.9	E	Derwent
13/12/2015 18:42	360	392	100	2.7	F	Ouse
13/12/2015 18:47	362	427	124	2.2	F	Ouse
13/12/2015 21:51	361	395	92	2.9	E	Derwent
13/12/2015 21:56	363	392	101	2.7	E	Ouse
13/12/2015 22:01	364	444	150	1.8	E	Ouse
14/12/2015 10:29	367	414	130	2.1	E	Derwent
14/12/2015 10:34	370	394	108	2.5	E	Ouse
14/12/2015 10:39	371	389	104	2.6	E	Derwent
14/12/2015 19:08	366	433	153	1.8	F	Ouse
14/12/2015 19:11	369	387	97	2.8	F	Ouse
14/12/2015 19:18	372	405	105	2.6	F	Ouse
15/12/2015 10:30	377	386	92	2.9	E	Ouse
15/12/2015 10:35	375	393	99	2.7	E	Derwent
15/12/2015 10:40	376	404	100	2.7	E	Derwent
15/12/2015 19:17	381	391	98	2.8	F	Ouse
15/12/2015 19:22	380	416	106	2.5	F	Ouse
15/12/2015 19:27	373	384	87	3.1	F	Ouse
16/12/2015 10:37	387	413	112	2.4	E	Ouse

Release time-date	Acoustic I.D.	Length (mm)	Weight (g)	Tag burden (%)	Tide	Route
16/12/2015 10:42	382	397	87	3.1	E	Derwent
16/12/2015 10:47	388	389	96	2.8	E	Ouse
16/12/2015 20:05	385	413	119	2.3	F	Ouse
16/12/2015 20:10	383	418	105	2.6	F	Ouse
16/12/2015 20:15	386	389	90	3.0	F	Ouse
17/12/2015 08:50	390	394	94	2.9	F	Ouse
17/12/2015 08:55	391	399	94	2.9	F	Ouse
17/12/2015 09:00	392	414	105	2.6	F	Ouse
17/12/2015 11:58	396	421	117	2.3	E	Ouse
17/12/2015 12:05	395	389	96	2.8	E	Ouse
17/12/2015 12:10	368	396	96	2.8	E	Ouse
17/12/2015 20:57	393	388	87	3.1	F	Ouse
18/12/2015 13:09	399	390	95	2.8	E	Ouse
18/12/2015 13:14	398	403	104	2.6	E	Ouse
18/12/2015 13:19	397	391	97	2.8	E	Ouse

Table S2. Coordinates of acoustic logging locations and lamprey release point (R), distance between locations, and lamprey detected at each site.

Location	Latitude	Longitude	Distance (m) from L1	Lamprey detected (*n*)	% of total
L1	53°43'36.84"N	0°53'25.02"W	0	1	1.7
L1	53°43'41.08"N	0°53'23.88"W	0		
L2	53°44'39.78"N	0°57'41.22"W	6424	13	22.0
R	53°44'53.58"N	0°57'54.65"O	6904		
L3a	53°45'5.19"N	0°58'44.86"W	7944	40	67.8
L3b	53°45'9.17"N	0°58'47.48"W	7944		
L4a	53°47'21.03"N	1° 3'15.57"W	19672	41	69.5
L4b	53°47'19.67"N	1° 3'12.91"W	19672		
L5	53°49'57.06"N	1° 5'14.15"W	28354	40	67.8
L6a	53°50'1.41"N	1° 7'24.88"W	31250	41	69.5
L6b	53°50'0.40"N	1° 7'28.87"W	31250		
L7a	53°51'12.46"N	1° 7'8.42"W	34431	35	59.3
L7b	53°51'6.06"N	1° 7'18.15"W	34431		
L8	53°53'14.94"N	1° 5'43.48"W	39823	35	59.3
L9	53°50'43.00"N	1° 7'51.89"W	33291	0	0.0
L10a	53°44'57.60"N	0°58'9.62"W	7232	53	89.8
L10b	53°44'57.60"N	0°58'9.62"W	7232		
L11	53°44'58.46"N	0°58'9.75"W	7257	27	45.8
L12	53°45'1.59"N	0°58'1.37"W	7469	16	27.1

Table S3. Time of release and of detection of acoustic tagged lamprey migrating through the Ouse estuary.

Tag ID	Release	L3	L4	L5	L6	L7	L8
341	29/11 23:23	30/11 19:19	07/12 8:22			07/12 22:18	08/12 2:12
342	30/11 19:05	30/11 20:37	02/12 16:04	03/12 13:32	03/12 22:41		
346	01/12 19:33	01/12 21:58	06/12 2:22	06/12 13:30	06/12 16:56	06/12 20:38	07/12 2:59
347	24/11 19:43	01/12 9:47	16/12 23:58	17/12 11:51	17/12 15:32	17/12 22:29	18/12 5:48
350	11/12 17:12	11/12 17:54	12/12 7:54	13/12 2:00	13/12 6:35		
352	12/12 17:53	12/12 18:31	13/12 10:14	13/12 22:53	14/12 7:01	15/12 2:18	
354	12/12 21:07	13/12 0:20	14/12 14:13	15/12 3:30	15/12 11:21	15/12 16:12	15/12 21:37
355	12/12 21:12	12/12 22:42	13/12 13:50	14/12 2:37	14/12 8:44	14/12 13:05	
359	29/11 12:00	29/11 14:44	06/12 17:05	07/12 0:07	07/12 2:30	07/12 4:49	07/12 7:56
360	13/12 18:42	14/12 7:42	18/12 14:15	18/12 23:37	19/12 1:47	19/12 5:07	19/12 13:34
362	13/12 18:47	14/12 0:44	14/12 14:31	15/12 3:50	15/12 17:17	15/12 23:13	16/12 7:28
363	13/12 21:56	13/12 23:53	17/12 11:28	17/12 20:50	17/12 23:23	18/12 3:00	18/12 8:29
364	13/12 22:01	15/12 20:37	16/12 19:05	17/12 3:38	17/12 7:55	17/12 19:41	18/12 1:55
365	24/11 19:43	25/11 4:07	26/11 16:33	27/11 8:32	27/11 20:24	27/11 23:15	28/11 17:41
366	14/12 19:08	14/12 19:38	15/12 21:29	16/12 9:35	16/12 17:28		
368	17/12 12:10	17/12 14:40	18/12 17:46	19/12 4:34	19/12 17:39	19/12 22:10	20/12 4:20
369	14/12 19:11	14/12 19:52	15/12 13:21	16/12 1:12	16/12 5:19	16/12 11:23	16/12 18:23
370	14/12 10:34	14/12 21:12	16/12 23:38	17/12 18:40	17/12 21:59	18/12 1:30	18/12 6:29
372	14/12 19:18	14/12 19:58	16/12 4:04	16/12 17:32	16/12 21:11	17/12 1:27	17/12 8:24
373	15/12 19:27	16/12 8:50	17/12 3:43	17/12 18:21	17/12 22:50		
374	29/11 18:44	29/11 19:44	30/11 9:51	01/12 3:37	01/12 9:43	01/12 23:02	02/12 15:56
377	15/12 10:30	15/12 17:21	16/12 22:35	17/12 15:27	17/12 20:08	18/12 0:15	18/12 14:38
378	25/11 20:08	09/12 10:56	19/12 10:27	19/12 19:23	19/12 22:14	20/12 2:01	20/12 6:15
380	15/12 19:22	15/12 20:26	16/12 13:32	17/12 1:01	17/12 5:47	17/12 12:51	17/12 20:05
381	15/12 19:17	15/12 20:57	18/12 14:20	18/12 23:06	19/12 1:56	19/12 5:40	19/12 13:40
383	16/12 20:10	16/12 20:42	17/12 13:34	17/12 22:25	18/12 0:43	18/12 3:51	18/12 9:08
384	29/11 11:55	29/11 15:20	30/11 9:28	30/11 19:00	30/11 22:33	01/12 2:02	01/12 8:00
385	16/12 20:05	18/12 17:33	19/12 5:11	19/12 17:45	19/12 20:29	20/12 0:07	20/12 3:58
386	16/12 20:15	17/12 5:28	17/12 18:34	18/12 11:15	18/12 14:48	18/12 19:11	19/12 0:58
387	16/12 10:37	16/12 17:01	17/12 2:30	17/12 12:35	17/12 16:31	17/12 20:41	18/12 2:21
388	16/12 10:47	16/12 14:13	17/12 10:18	17/12 19:59	17/12 22:51	18/12 1:43	18/12 6:46
389	29/11 18:39	29/11 19:46	03/12 12:54	05/12 2:56	05/12 7:25		
390	17/12 8:50	18/12 8:43	19/12 14:19	19/12 23:09	20/12 1:36	20/12 4:00	20/12 14:49
391	17/12 8:55	17/12 10:07	18/12 23:30	19/12 13:53	19/12 17:13	19/12 22:24	20/12 3:35
392	17/12 9:00	17/12 14:06	17/12 23:15	18/12 5:15	18/12 7:24	18/12 10:50	18/12 15:26
393	17/12 20:57	17/12 22:02	18/12 22:48	19/12 15:35	19/12 19:08	19/12 22:37	20/12 3:31
395	17/12 12:05		17/12 23:08	18/12 6:51	18/12 9:49	18/12 14:15	18/12 19:18
396	17/12 11:58	17/12 14:00	18/12 0:34	18/12 11:09	18/12 14:18	18/12 18:21	18/12 23:37
397	18/12 13:19	18/12 15:18	19/12 5:51	19/12 22:14	20/12 1:39	20/12 15:36	20/12 22:34
398	18/12 13:14	18/12 14:47	19/12 0:41	19/12 16:57	19/12 21:09	20/12 2:30	20/12 14:51
399	18/12 13:09	18/12 15:27	19/12 0:19	19/12 12:45	19/12 15:44	19/12 19:00	19/12 23:44

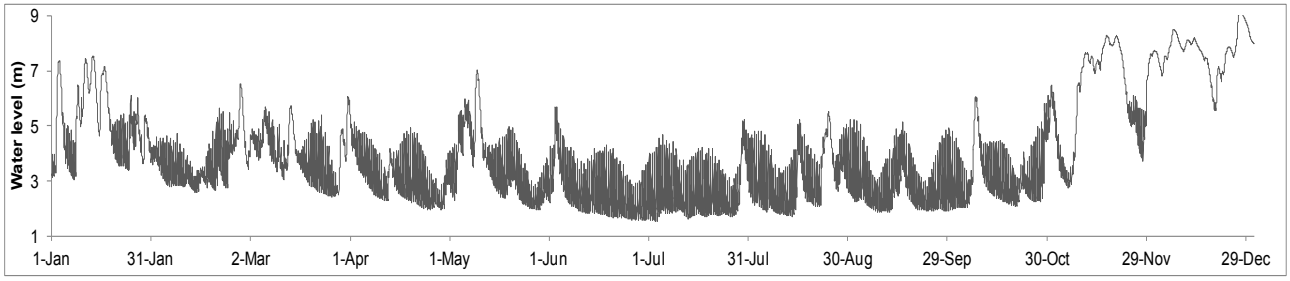

Fig. S1. River Ouse water levels at L8 in 2015. The twice daily tidal fluctuations, condensed on the timescale presented, appear shaded, but are lost during very high flow conditions (which appear as periods with a single line).

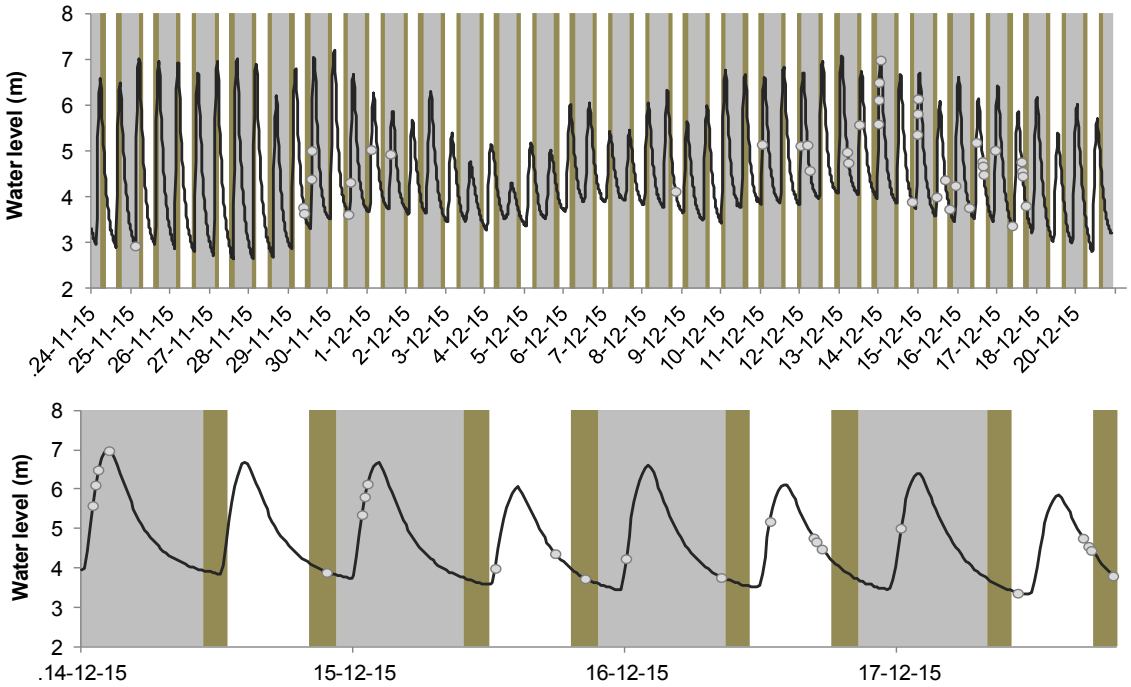

Fig. S2. Tidal cycle, diel cycle (night: grey bar; twilight: green; day: clear) and lamprey migration detections at L3 during the study period. From top to bottom for the whole study period and for a shorter period to better see the moment of detection.

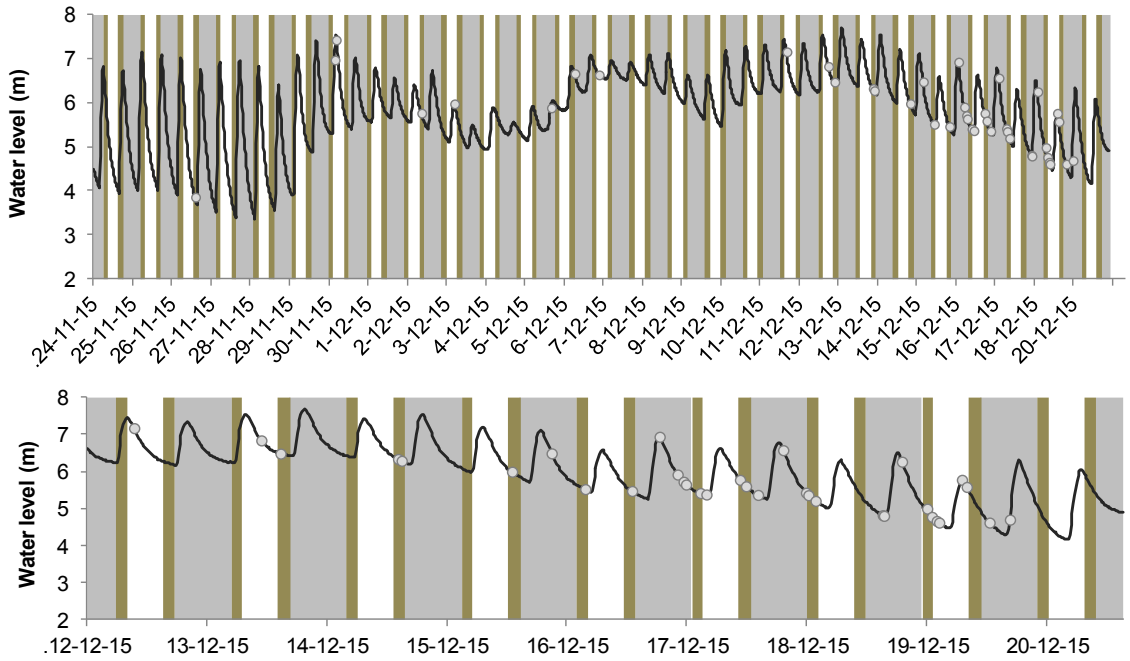

Fig. S3. Tidal cycle, diel cycle (night: grey bar; twilight: green; day: clear) and lamprey migration detections at L4 during the study period. From top to bottom for the whole study period and for a shorter period to better see the moment of detection.

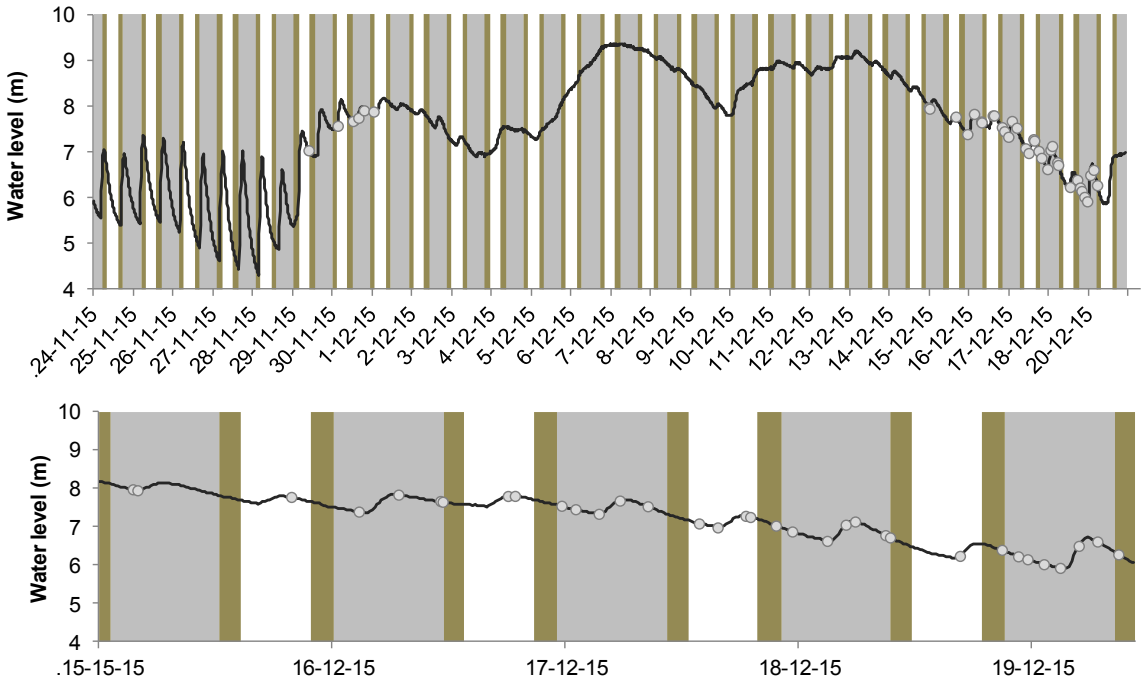

Fig. S4. Tidal cycle, diel cycle (night: grey bar; twilight: green; day: clear) and lamprey migration detections at L6 during the study period. From top to bottom for the whole study period and for a shorter period to better see the moment of detection.

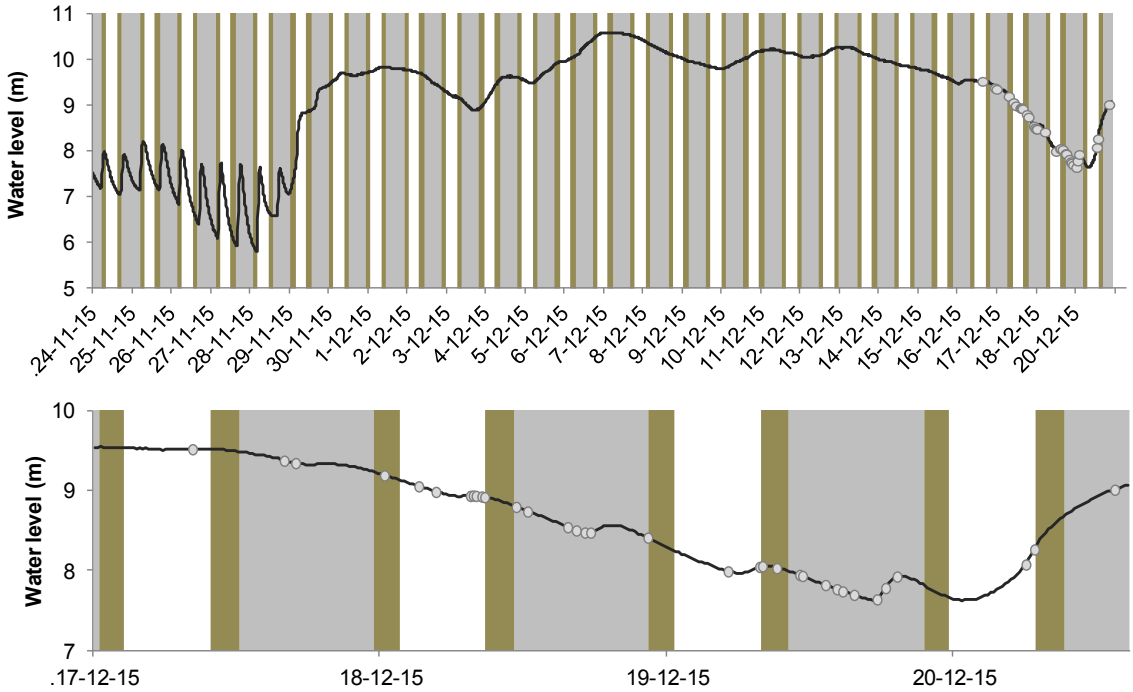

Fig. S5. Tidal cycle, diel cycle (night: grey bar; twilight: green; day: clear) and lamprey migration detections at L8 during the study period. From top to bottom for the whole study period and for a shorter period to better see the moment of detection.