

Smolt Production estimate for the entire Deveron catchment per annum

- Since 2014 we have run 2 smolt traps; one on the Allt Deveron and one on the lower Blackwater.
- The widely used Rotary Screw Traps (RST) funnel downstream migrating salmon and trout into a holding box via a rotating drum.



- The traps are checked daily over the entire smolt run period (March – May). All fish are identified, counted and recorded before being released downstream.
- The traps only catch a proportion of the migrating salmon and trout and so mark-recapture is used to estimate the efficiency of the trap. Every few days a number of salmon and trout are marked with a small dye mark and released upstream. The number of dye-marked fish re-caught is used to measure the efficiency of the trap.
- Trap efficiency is used to estimate total run of salmon and trout from upstream of each trap (see table)

	2014		2015		2016		2017		2018	
	Count	Estimate (95% CI)	Count	Estimate (95% CI)	Count	Estimate (95% CI)	Count	Estimate (95%CI)	Count	Estimate (95%CI)
Allt Deveron Salmon	3043	5951 (+/- 562)	1443	8250 (+/-1571)	2108	5031 (+/- 813)	1653	3488 (+/-508)	3455	8853 (+/-1295)
Blackwater Salmon	1133	3835 (+/- 886)	1438	4130 (+/- 755)	373	2872 (+/- 1604)	1154	2248 (+/- 348)	1469	3270 (+/-530)

- We know the wetted river area of accessible habitat upstream and can use the total salmon run estimate to produce an estimated number of smolts per 100m² of wetted area.

	2014 (smolts/100m ²)	2015 (smolts/100m ²)	2016 (smolts/100m ²)	2017 (smolts/100m ²)	2018 (smolts/100m ²)	Average (smolts/100m ²)
Allt Deveron Salmon	6.69	9.27	5.65	3.92	9.95	7.1
Blackwater Salmon	3.86	4.15	2.89	2.26	3.29	3.29

- The average smolt production across the Allt Deveron and Blackwater catchments is 5.2 smolts/100m² With a maximum of 9.95 and a minimum of 2.26 smolts/100m². The range in Scotland varies from 1-9 smolts/100m².
- If this is applied to the total Deveron catchment which has an accessible wetted area of 3.7million m² it translates to an average total smolt production of 192,000 per annum. This likely ranges from a maximum of 368150 smolts to a minimum of 83620 smolts per annum.
- Using the widely reported 5% marine survival figure this Deveron smolt production can then be translated into numbers of potential returning adults.

Deveron total adult salmon run estimate based on smolt production:

Average: 9,600 salmon, Maximum: 18,4075 salmon, Minimum 4181 salmon

Scottish Government (Marine Scotland Science) estimate based on Rod Catch

- Under the 2016 Salmon Conservation Regulations the Scottish Government has developed a model for estimating the number of returning adults to enable the classifications of individual rivers.
- The model uses the reported rod catch to estimate the total run of salmon. This takes into account variations in catch rates according to month, flow rates and latitude but does not take into account rod effort. Ultimately the model is based on data from a number of rivers with counters.
- They have estimated the run as ranging from 6-14,000 salmon for the years 2013-2016 (See Table). I have then added the rod catch for that year to give an indication of the percentage of salmon caught by rod and line each year.

Year	Estimated total run	Rod Catch	Catch rate
2013	14,000	1925	13.8%
2014	6,000	1129	18.8%
2015	7,000	951	13.5%
2016	12,500	1554	12.4%

- It is interesting that the number of returning adult salmon estimated by the Scottish Government estimate is in the same overall range as our own estimates that are derived from completely unrelated data sources.
- Ultimately an effective counter is the only way we will be able to know how many fish enter the Deveron each year. We are currently working on a plan for a counter in the lower Deveron and have trialled a sonar device at Montcoffer, however this is the first time this technology has been used for counting fish and needs further testing and development.