



VEIÐIMÁLASTOFNUNIN.

A survey of fry abundance in
Langá river in 1981

by

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Introduction

Electric fishing for salmon fry was conducted in Langá on the 19th and 20th of September 1981. The author was assisted by Ingvi Hrafn Jónsson, Sveinn Snæland and Orri Vigfússon. Weather was unfavourable for effective fishing during early Saturday and late Sunday, but reasonable in between. River temperatures were 4-5°C, which is fairly low for the fish to respond well to electricity.

Results

The results of the electric fishing are shown in table 1. It shows that the abundance of salmon fry was unusually high in the upper river but only a meager average in the lower sections. This is in good agreement with earlier surveillances which have always demonstrated that the rearing area improves as we go higher up in the stream. The number of 0+ fry indicates that the spawning in 1980 has been more successful in the upper sections than in the lower ones. Fry from the 1979 spawning (1+) are, on the other hand, very abundant in all areas, as a result of very favourable growing conditions in the summer of 1980.

Due to lower densities in the lower sections of the stream, growth of individual year-classes seemed to be somewhat better than in upper-Langá (figure 1). Smolt production, however, per 100 m² was lower in the lower reaches.

Langá-river, as many of Borgafjörður's streams suffered greatly reduced salmon catches in 1980 and 1981. Such a reduction in grilse abundance was hardly expected in 1981 since the spring of 1980 had been favourable for smolt migration. The reason, therefore, had to lie in the absolute production of smolts in 1980. Results of all electric fishing operations performed in Langá have been summarized in table 2, in the hope that these might shed some light on the real reasons for the downfall. Langá has been electro-fished every year from 1977, with the exception of 1978

when floods prevented the operation.

Table 2 shows the real quantities of all age-groups above and below the "Sveðja" waterfall, as well as the mean length of the fry in each year-class. As a rule there is approximately 40-50% more biomass per area of river bottom in the upper-Langá, which is consistent for all age-groups. Differences in fry lengths in individual years classes are, however, not significantly different between upper and lower Langá. In praxis one must conclude that the upper part produces considerably more smolts than the lower part.

The question arises, if it would be possible to see any evidence from the data, about reduced numbers of smolts in the spring of 1979 and 1980. The year-class destined to go to sea in 1979 was in reasonable quantities in the river in 1977, and since 1978 fishing was not performed, we have no evidence of reduced smolt production in 1979. Considering the uniform lack of grilse all over Iceland in 1980, it seems more reasonable that the cold spring and summer temperatures in 1979 delayed the smolt migration in that year in such a way, that very few smolts made it to their oceanic feeding grounds. It must be borne in mind that smolts are feeding voraciously just before they migrate to sea and unsuspected failure of certain insect larvae to hatch (also dependent on river temperature) may have detrimental effect on the smolt population.

If we, on the other hand, look at the smolt situation in the spring of 1980, it is borne out in the electric fishery in 1979 that the abundance of pre-smolts is unusually low and their average size greatly reduced. Such a growth reduction is not surprising, considering the climatic conditions in that year and would certainly result in abnormally few smolts the following year. A similar phenomenon was observed in Selá-river at Vopnafjörður in 1979, where two age classes below smolt age practically merged, leaving very few fish to smolt the following year.

I do not think that the data available permits any prophecy about the fishery in Langá for the coming years. Lot of unexpected things can happen during the 8 months that pass from the time that the electric surveillance takes place, until the smolts go to sea. We can, however, point out that the abundance of pre-smolts was well above average in the fall of 1980. The average size of the parr was high, increasing the fraction that should have smolted in 1981.

The spring of 1981, however, was not as favourable as one would have liked.

The data in table 2 indicates that the yearly mortality of each age-group in Langá lies around 40-50%. We have thus only 15% survival of each 0+-class to the end of fourth summer and only 10% of the 0+ group ever get into the sea.

Figure 1 shows the length frequencies of the fry caught in the 1981 fishery. We see that the growth of the fry seems to be somewhat better in lower Langá, that in the upper reaches, to some extent a pure function of fry density.

Summer-old fry of hatchery origin, which were planted in the upper-most reaches during the summer of 1981 were 50-70 mm in length in the fall. These fry will reach smolt size in three summers, a year ahead of their natural counterparts. Growth is somewhat better at Ármótafljót than closer to Langavatn. This is probably both due to heavier char competition as well as lower temperatures closer to the lake.

The necessity of controlling winter-floods in Langá has been stressed in previous reports. The devastating floods are probably one of the main reasons for lower smolt production below the "Sveója" waterfall. Controlled water flow from Langavatn during the winter will be very beneficial in the long run.

Several methods can be used to enhance the production of Langá. The most effective method is to release one-summer-old fry in upper-Langá, mostly from Ármótafljót down to Tófufoss. Up to 5000 fry per hectare of river bottom can be planted, but should be well distributed.

Another method of interest is smolt releases. Recent experiments at Lárós salmon ranching site on Snæfellsnes have given 11% returns of one year hatchery smolts. The smolts were transplanted from Kollafjörður hatchery to the release site in early May and fed for 1 month before release in floating pens. Conditions at Langá are favourable for such an experiment and one can be relatively optimistic about results. Suggested quantity for such an experiment is 3000-5000 microtagged smolts. Considerable effort must be exerted the following two years to retrieve the tags.

In this report I have tried to outline the basic information that can be deduced from fry surveillances in Langá in the last few years. Such a yearly control must be considered very useful to detect abnormal conditions that arise especially if they happen early in the freshwater phase. These techniques will never be very good to estimate absolute abundance of smolts, since they tend to stay at least partly in areas which are inaccessible for electric fishing and they are also most efficient in avoiding capture. One should, however, have a fairly good general idea of the situation up to the last 8 months of the freshwater phase.

Table 1. Results of the electric fishing in Langá 19th-20th of Sept. 1981.

Veiddstaður	area m ²	fishing efficiency	Numbers of fry	Number of fry pr. 100 m ²	Mean length mm			Numbers of fry pr. age gr. Annab			
					O+	I+	II+ III+	O+	I+	II+ III+	
Breidda o. sjávarf.	300	25%	32	42	-	-	-	1	26	3	2
Anabrekkeymar	160	25%	15	38	-	-	-	3	11	1	0
Jarðlangstaðeyr	185	25%	24	52	-	-	-	6	18	0	0
Háspennustrengur	100	25%	23	92	-	-	-	10	13	0	0
N-Hvítsstaðahlur	200	25%	44	88	-	-	-	5	31	6	2
Sólvangur	280	25%	90	130	-	-	-	33	46	11	0
Veiddstaður F	200	50%	43	43	-	-	-	28	12	1	1
Veiddstaður A	300	50%	74	50	-	-	-	40	19	9	6
Fyrir o. Langasjó	100	25%	34	136	-	-	-	26	4	4	0
Heild f.n.Sveðju	1825	-	379	74	33	57	85	152	181	35	11
Skriðuflijtót	120	50%	104	170	-	-	-	61	25	14	4
F.n.Campari	100	25%	44	176	-	-	-	27	11	3	2
F.o Campari	150	25%	80	200	-	-	-	41	30	8	1
Heild f.o.Sveðju	370	-	223	180	33	53	75	129	66	26	7
Amótaflijtót	300	50%	45	30	71	98		41*	4*		7 bleikjur
Næðan stíflu	100	50%	37	74	56	0		37	0		33 bleikjur

Table 2. Comparison of catch data from electro-fishing operations in Langá 1975-1981.

Location	Item	Year						Mean
		1975*	1977	1979	1980	1981		
Above "Sveðja" Ofan Sveðjufoss	quantity pr. 100 m	21	48	23	44	60	39	
	O+	0	16	8	21	35	20	
	I+	10	13	7	10	18	12	
	II+	7	14	5	7	7	8	
	III+	3	4	2	4	3	3	
	O+	-	33	31	34	33	33 mm	
	I+	-	54	51	56	53	53 mm	
	II+	-	75	71	76	75	74 mm	
	III+	-	96	93	103	100	98 mm	
	quantity pr. 100 m	21	36	18	27	21	25	
Below "Sveðja" Neðan Sveðjufoss	quantity pr. 100 m	0	15	10	14	8	12	
	O+	10	12	3	6	10	8	
	II+	6	3	4	5	2	4	
	III+	4	1	1	2	1	2	
	O+	-	32	31	37	33	33 mm	
	I+	-	46	51	55	57	52 mm	
	II+	-	64	71	77	85	74 mm	
	III+	-	85	96	108	111	100 mm	
	quantity pr. 100 m	21	36	18	27	21	25	

* rafveiðar í byrjun júní, aðrar framkvæmdar í september.

Figure 1. Length frequency of electrofished fry in Langá during the 1981 fishing operation.

