Supporting Information Cover Sheet:

Title: **Reduced trace element concentrations in fast-growing juvenile Atlantic salmon in natural streams**

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3 Tables, 5 pages

Table S1 Summary of environmental characteristics and site-mean element concentrations in salmon (mean, standard deviation (SD), and observed range) and their correlations across sites. Bold values indicate that the P-value for the pair-wise correlation is <0.05.

			Correlation coefficients						
	Mean (SD)	**Range**	**As**	**Cd**	**Cs**	**Hg**	**Pb**	**Se**	**Zn**
% Forest (catchment)	79 (11)	54-98	-0.21	0.12	**0.71**	0.35	0.13	-0.09	0.19
% Wetland (catchment)	3.2 (1.1)	1.5-5.0	**0.70**	0.31	-0.41	0.03	0.51	**0.56**	0.45
% Canopy (site)	64 (24)	30-93	**0.74**	**0.87**	0.22	**0.80**	**0.60**	**0.82**	**0.87**
Alkalinity (meq/L)	0.21 (0.19)	0.04-0.67	-0.13	**-0.58**	**-0.54**	**-0.87**	-0.40	-0.49	**-0.67**
pH	6.8 (0.4)	6.3-7.4	-0.43	**-0.74**	**-0.56**	**-0.95**	**-0.53**	**-0.65**	**-0.82**
Prey biomass (log_{10} mg/m^2)	0.72 (0.37)	0.16-1.3	**-0.67**	**-0.90**	-0.18	**-0.73**	**-0.65**	**-0.82**	**-0.79**
Temperature (°C)	15.6 (0.55)	14.5-16.5	**0.63**	0.20	-0.26	0.15	0.39	0.28	0.37
As (ppm dry)	0.36 (0.11)	0.21-0.58	1	**0.72**	-0.13	0.48	0.50	**0.80**	**0.74**
Cd (ppm dry)	0.33 (0.32)	0.08-1.2		1	0.27	**0.79**	**0.61**	**0.85**	**0.88**
Cs (ppm dry)	0.29 (0.26)	0.07-0.91			1	**0.52**	-0.07	-0.08	0.13
Hg (ppm dry)	0.56 (0.37)	0.12-1.2				1	0.49	**0.67**	**0.80**
Pb (ppm dry)	2.4 (2.9)	0.21-12					1	**0.57**	**0.67**
Se (ppm dry)	2.5 (1.5)	0.9-5.9						1	**0.91**
Zn (ppm dry)	289 (149)	156-585							1

Table S2 Maximum observed trace element concentrations in prey organisms (ppm dry basis) compared to maximum tolerable levels in the diet that do not impair fish health or performance (*1*). Values are those for Atlantic salmon or other Salmonidae.

Element	Max. observed prey concentration	Max. tolerable level
As	2.2	5
Cd	6	10
Pb	2.6	10
Hg	0.6	1
Se	3.4	2[a]
Zn	485	560[b]

[a]Two sites had prey Se concentrations that exceed this level. Eight individual fish at these two sites had whole-body concentrations that exceeded the fish tissue threshold (4 ppm) (*2*).
[b]Minimal data for Zn diet concentrations in ref. 1, the value here is from ref 3, converted from daily dose assuming 0.08 g/g/day consumption rate.

Table S3 Median, 75th percentile, and maximum concentrations of each element across all individual fish (ppm dry basis) compared to the no effects hazard concentrations (NEHC; ref. 4) for birds and mammals that consume fish. The "% individuals" is the percent of all individuals sampled that exceed the NEHC; the "No. sites" is the number of sites where at least one individual exceeded the NEHC; NA indicates that no data was available.

	Observed concentrations			**Exceeding NEHC**					
Element	**Median**	**75th**	**Max.**	**Bird NEHC**	**% individuals**	**No. sites**	**Mammal NEHC**	**% individuals**	**No. sites**
As	0.33	0.45	0.77	112	0	0/15	38.2	0	0/15
Cd	0.2	0.43	1.9	73.5	0	0/15	28.3	0	0/15
Cs	0.18	0.38	0.95	NA			NA		
Hg	0.38	0.8	1.5	0.32	60%	10/15	1.85	0	0/15
Pb	1.3	2.7	15.4	81.5	0	0/15	173	0	0/15
Se	2	3.4	8	20	0	0/15	5.65	5%	2/15
Zn	200	404	735	725	1.7%	1/15	4520	0	0/15

References

(1) National Research Council *Mineral tolerance of animals*; National Acadamies Press: Washington, DC, 2005.

(2) Hamilton, S.J. Review of selenium toxicity in the aquatic food chain. *Sci. Total Environ.* 2004, *326*, 1-31.

(3) Clearwater, S.J.; Farag, A.M.; Meyer, J.S. Bioavailability and toxicity of dietborne copper and zinc to fish. *Comp. Biochem. Physiol. C-Toxicol. Pharmacol.* 2002, *132*, 269-313.

(4) Hinck, J.E.; Schmitt, C.J.; Chojnacki, K.A.; Tillitt, D.E. Environmental contaminants in freshwater fish and their risk to piscivorous wildlife based on a national monitoring program. *Environ. Monit. Assess.* 2009, *152*, 469-494.