SUPPLEMENTAL MATERIAL

Table S1. Sample sizes of subyearling Chinook salmon used in diet, scale, and IGF-1 analyses.

		Diet		Scale		IGF-1	
Study region	Month	2014	2015	2014	2015	2014	2015
Nisqually	March	27					
	April	12					
	May	83	17	49	30		
	June	80	28	39	34		
	July	30	20	6	6		
	August	11		1			
Snohomish	March	27					
	April	42					
	May	6	10		42		
	June	91	27	138	76		
	July	94	20	55	43		
	August	2	10	5	48		
Skagit	March	52	10	2	8		
	April	96	10	11	10		
	May	121	20	21	16		
	June	136	40	79	99	113	118
	July	54	39	73	120	134	133
	August	40	20	34	21	58	47
Nooksack	March	40	57	1	6		
	April	52	27	7	1		
	May	75	27	37	19		
	June	86	40	63	50	59	66
	July	66	32	43	83	33	105
	August	31	20	17	42	39	51
San Juan Islands	March						
	April						
	May						
	June	52	16	23	2	57	15
	July	51	37	27	8	66	34
	August	8	24	3	5	8	21

Table S2. Prey taxonomic groups, representative taxa found in Chinook salmon diets, average dietary wet weight biomass when consumed (WWB), and energy density estimates (ED) derived from literature values. Proportional gravimetric data can be found in Connelly et al. 2018.

Prey taxonomic group	Taxon	WWB (g)	ED (J g^{-1})	Source
Diptera (adult)	Diptera	0.014	4594	1
	Brachycera		8920	1
	Nematocera		3830	1
	Unidentified insect parts		4594	1
Insecta (adult)	Hemiptera	0.028	10930	2
	Hemiptera (nymph)		10930	2
	Hymenoptera		12670	2
	Ephemeroptera		3664	3
	Ephemeroptera (nymph)		3664	3
	Odonata		4879	1
	Odonata (nymph)		4879	1
	Plecoptera		4125	3
	Plecoptera (nymph)		4125	3
	Unidentified nymph		3985	3
	Arachnida		5320	2
	Collembola		5621	2
	Coleoptera		7970	2
	Lepidoptera		8500	2
	Psocoptera		6430	4
	Psocoptera (nymph)		6430	4
	Trichoptera		7760	2
	Unidentified adult insect		7412	1
	Unidentified insect eggs		6000	1
Insecta (larvae)	Diptera pupa	0.005	3140	2
	Unidentified insect pupa		3140	2
	Coleoptera larvae		2405	2
	Diptera larvae		2580	2
	Lepidoptera larvae		8500	2
	Tricoptera larvae		5810	2
	Unidentified insect larva		2580	2
Amphipoda	Caprellidea	0.016	2970	1
	Corophiidae		3065	1
	Gammaridae		2970	1
	Hyperiidae		2464	5
	Unidentified amphipod		2970	1
Mysida	Mysida	0.088	3550	2
Decapoda (larvae)	Crab megalopa	0.048	4225	6
	Crab (post-larval)		4225	6
	Paguroidea megalopa		4225	6
	Paguroidea (adult)		4225	6
	Shrimp (larval)		4225	6
	Crab zoea		3395	7
	Shrimp zoea		3395	7

Prey taxonomic group	Taxon	WWB (mg)	ED (J g^{-1})	Source
Krill	Euphausia	0.137	4729	8
	Shrimp (other)		4730	1
	Unidentified shrimp		4730	5
Crustacea (other)	Barnacle nauplii	0.015	2160	1
	Barnacle cyprid		2160	1
	Barnacle juvenile		2160	1
	Cladocera		1370	8
	Copepod (calanoida)		4620	8
	Copepod (cyclopoida)		4620	8
	Copepod (harpacticoida)		4620	8
	Copepod (unidentified)		4620	8
	Cumacea		3370	1
	Isopoda		2960	1
	Larvacea		3180	5
	Ostracoda		3370	1
	Siphonostomatoida		4620	8
	Tanaidacea		3370	1
	Unidentified crustacean		3370	1
	Digested crustacean		3370	1
Annelida	Polychaeta	0.077	1980	2
	Unidentified worm		1980	1
Fish	Anchovy	0.277	3440	9
	Herring		3690	9
	Sand Lance		5060	9
	Chum salmon		3410	9
	Pink salmon		3410	9
	Unidentified salmon		3410	9
	Unidentified fish		3500	1

Sources: [1]David et al. 2014, [2]Gray 2005, [3]Pizzul et al. 2009, [4]Norberg 1978, [5]Davis et al. 1998, [6]Marin Jarrin 2012, [7]Nishiyama 1977, [8]Higgs et al. 1995, [9]Anthony et al. 2000

Anthony JA, Roby DD, Turko KR (2000) Lipid content and energy density of forage fishes from the northern Gulf of Alaska. J Exp Mar Biol Ecol 248:53–78

Connelly KA, Gardner JR, Gamble MM, Chamberlin JW, Winans A, Keister J, Beauchamp DA (2018) Marine survival of Puget Sound Chinook: size-selective mortality growth limitation and bioenergetics of sub-yearling Chinook salmon in Puget Sound, Washington. Long Live the Kings Technical Report LLTK-SSMSP-9, Seattle, Washington, USA

David AT, Ellings CS, Woo I, Simenstad CA, Takekawa JY, Turner KL (2014) Foraging and growth potential of juvenile Chinook salmon after tidal restoration of a large river delta. Trans Am Fish Soc 143:1515–1529

Davis ND, Myers KW, Ishida Y (1998) Caloric value of high-seas salmon prey organisms and simulated salmon ocean growth and prey consumption. N Pac Anadromous Fish Comm Bull 1:146–162

Gray A (2005) The Salmon River Estuary: restoring tidal inundation and tracking ecosystem response. PhD dissertation, University of Washington, Seattle, Washington, USA

Higgs DA, Macdonald JS, Levings CD, Dosanjh BS (1995) Nutrition and feeding habits in relation to life history stage. In: Groot C, Margolis L, Clarke WC (eds) Physiological Ecology of Pacific Salmon. University of British Columbia Press, Vancouver, Canada, pp 159–315

Marin Jarrin JR (2012) Sandy beach surf zones: what is their role in the early life history of juvenile Chinook salmon (*Oncorhynchus tshawytscha*)? PhD dissertation, Oregon State University, Corvallis, Oregon, USA

Nishiyama T (1977) Food-energy requirements of Bristol Bay sockeye salmon *Oncorhynchus nerka* (Walbaum) during the last marine life stage. Special Bulletin of the Research Institute of North Pacific Fisheries, pp. 289–320

Norberg RA (1978) Energy content of some spiders and insects on branches of spruce (*Picea abies*) in winter; prey of certain passerine birds. Oikos 31:222–229

Pizzul E, Bertoli M, Basset A, Vignes F, Calligaris M, Tibaldi E (2009) Energy densities of brown trout (*Salmo trutta*) and its main prey items in an alpine stream of the Slizza Basin (Northwest Italy). J Freshwat Ecol 24:403–410

Table S3. Candidate generalized linear models (with corresponding hypotheses), degrees of freedom (df), McFadden's pseudo-R^2 (R^2), AIC, and ΔAIC values for fork length (mm), stomach fullness (%), and dietary energy density (J g^{-1}). A "/" indicates a nested effect. ΔAIC was used to select the best-fit candidate model, where a ΔAIC value > 2 between the best-fit model and the next most parsimonious model was considered robust evidence for model support. The best-fit candidate model for each response variable is indicated in bold font.

Candidate model	df	R^2	AIC	ΔAIC
Fork length				
H1: Year/Day	5	0.69	17042.40	1534.74
H2: Habitat/Region	18	0.80	16218.19	710.53
H2: Year/Habitat/(Day × Region)	51	0.85	15720.72	213.06
H4: Year/Habitat/(Day × Region × Origin)	**88**	**0.86**	**15507.66**	**0.00**
Stomach fullness				
H1: Year/Month	13	0.02	4189.40	173.35
H2: Habitat/Region	15	0.07	4084.66	68.61
H2: Year/(Month × Habitat)/Region	**93**	**0.19**	**4016.05**	**0.00**
H3: Size/Origin	15	0.01	4209.17	193.12
H3: Year/Size/Origin	27	0.02	4211.09	195.04
H4: Year/(Month × Habitat)/(Region × Origin)	147	0.21	4034.59	18.54
H4: Year/(Size × Habitat)/(Region × Origin)	163	0.19	4078.60	62.55
Energy density				
H1: Year/Month	13	0.08	35707.29	467.44
H2: Habitat/Region	15	0.07	35746.22	506.37
H2: Year/(Month × Habitat)/Region	93	0.32	35252.93	13.08
H3: Size/Origin	15	0.04	35812.57	572.72
H3: Year/Size/Origin	27	0.04	35825.95	586.10
H4: Year/(Month × Habitat)/(Region × Origin)	**147**	**0.36**	**35239.85**	**0.00**
H4: Year/(Size × Habitat)/(Region × Origin)	163	0.24	35619.59	379.74

Table S4. Candidate generalized linear models (with corresponding hypotheses), degrees of freedom (df), McFadden's pseudo-R^2 (R^2), AIC, and ΔAIC values for scale-derived growth rate (g d^{-1}) and IGF-1 concentration (ng ml^{-1}). A "/" indicates a nested effect. ΔAIC was used to select the best-fit candidate model, where a ΔAIC value > 2 between the best-fit model and the next most parsimonious model was considered robust evidence for model support. The best-fit candidate model for each response variable is indicated in bold font.

Candidate model	df	R^2	AIC	ΔAIC
Scale-derived growth rate				
H1: Year/Month	8	0.45	-1176.42	1971.48
H2: Habitat/Region	15	0.34	-886.01	2261.89
H2: Year/(Month × Habitat)/Region	51	0.65	-1751.09	1396.81
H3: Size/Origin	12	0.85	-3111.52	36.38
H3: Year/Size/Origin	13	0.85	-3110.30	37.60
H4: Year/(Month × Habitat)/(Region × Origin)	71	0.65	-1742.71	1405.19
H4: Year/(Size × Habitat)/(Region × Origin)	**78**	**0.87**	**-3147.90**	**0.00**
IGF-1 concentration				
H1: Year/Month	7	0.06	9648.63	473.23
H2: Habitat/Region	7	0.14	9546.56	371.16
H2: Year/(Month × Habitat)/Region	31	0.22	9477.86	302.46
H3: Size/Origin	13	0.33	9279.65	104.25
H3: Year/Size/Origin	25	0.34	9272.56	97.16
H4: Year/(Month × Habitat)/(Region × Origin)	59	0.27	9465.23	289.83
H4: Year/(Size × Habitat)/(Region × Origin)	**91**	**0.46**	**9175.4**	**0.00**

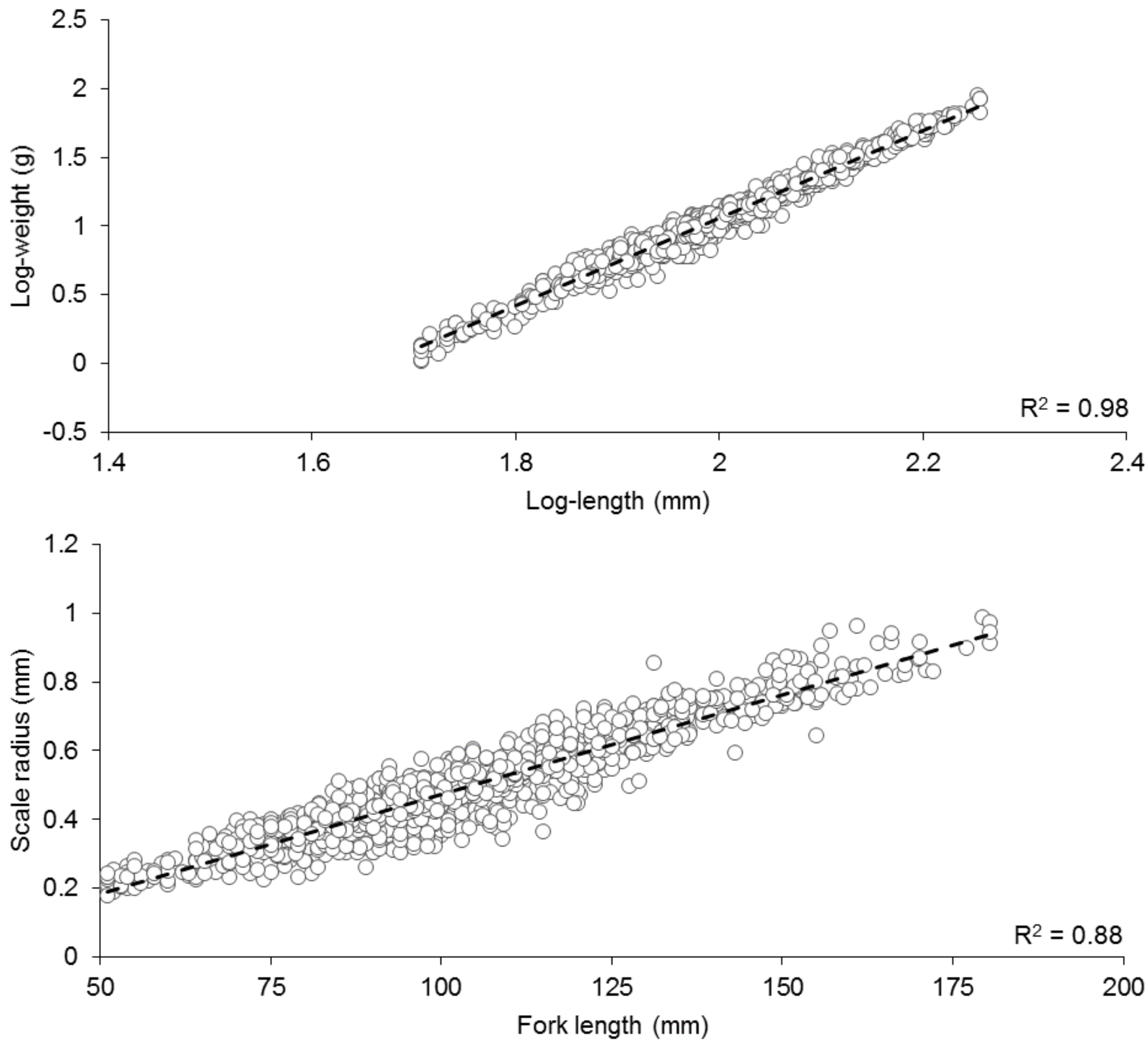

Fig. S1. Linear relationships between log-weight and log-fork length (top) and fork length and scale radius (bottom).