Supplementary material

Growth variation of Atlantic salmon, *Salmo salar*, at sea affects their population-specific reproductive potential

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Supplement 1 - Length distributions of returning adult females, sea age frequencies and river outlet locations

Supplement 2 - Size-specific fecundity data for river Dalälven and Umeälven

Supplement 3 - Annual number of released smolts, survival and growth at sea for smolt year classes originating from Dalälven and Umeälven

Supplement 4 - Mark-recapture model configuration

Supplement 5 - Conceptual figures showing how survival and growth at sea was calculated for two- and three sea winter (2SW and 3SW) returning adult females for each smolt year class for Dalälven and Umeälven

Supplement 6 – Model parameter estimates and evaluation plots

Supplement 1. Length distributions of returning adult females, sea age frequencies and river outlet locations.

The length distributions of returning adult females originating from river Dalälven (Fig. S1 and S3) and river Umeälven (Fig. S2 and S3) hatcheries. Each female was captured in permanent fish traps used for collecting broodstock for each hatchery (one in each river).

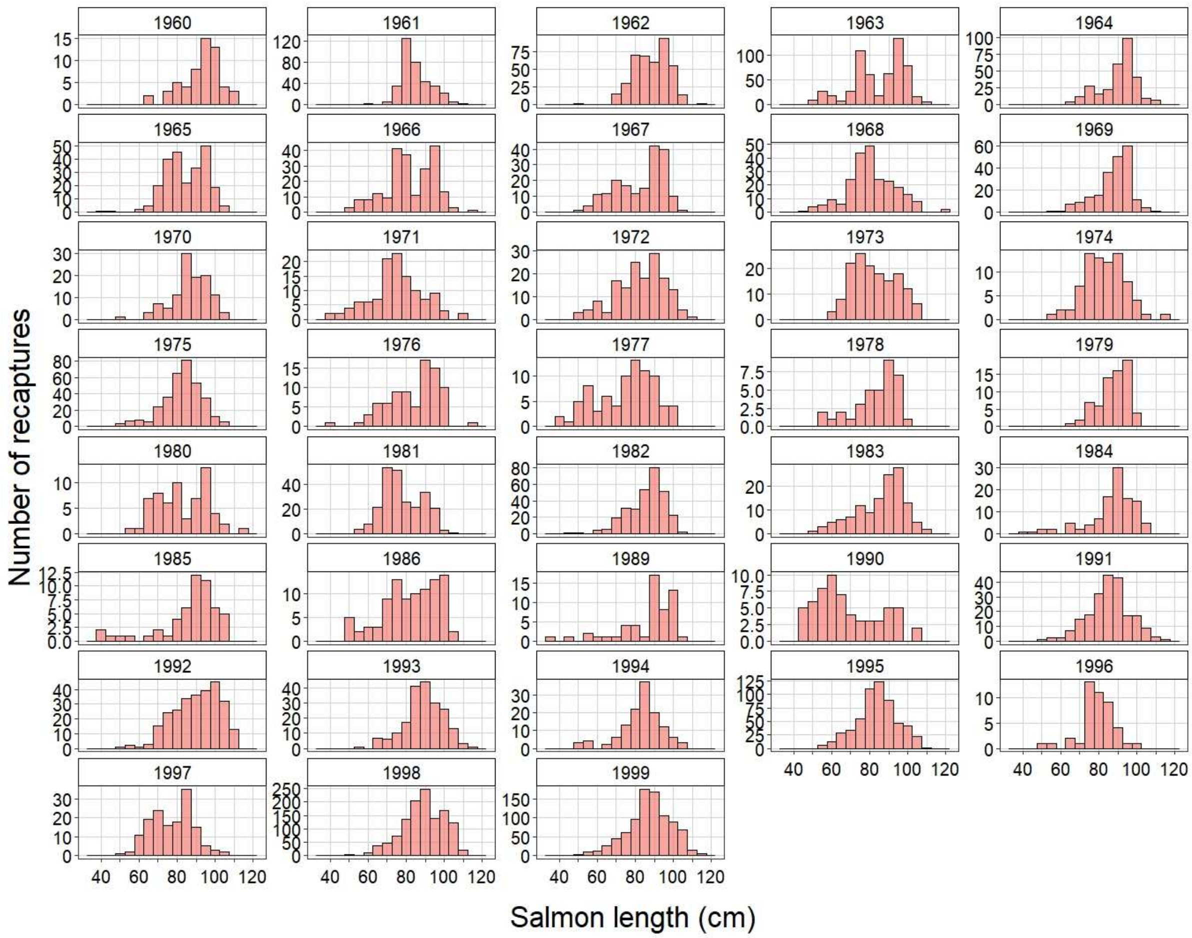

Figure S1. Annual length distributions of returning adult females with hatchery origin in the spawning run for Dalälven. Note that the y-axes are not identical among plots.

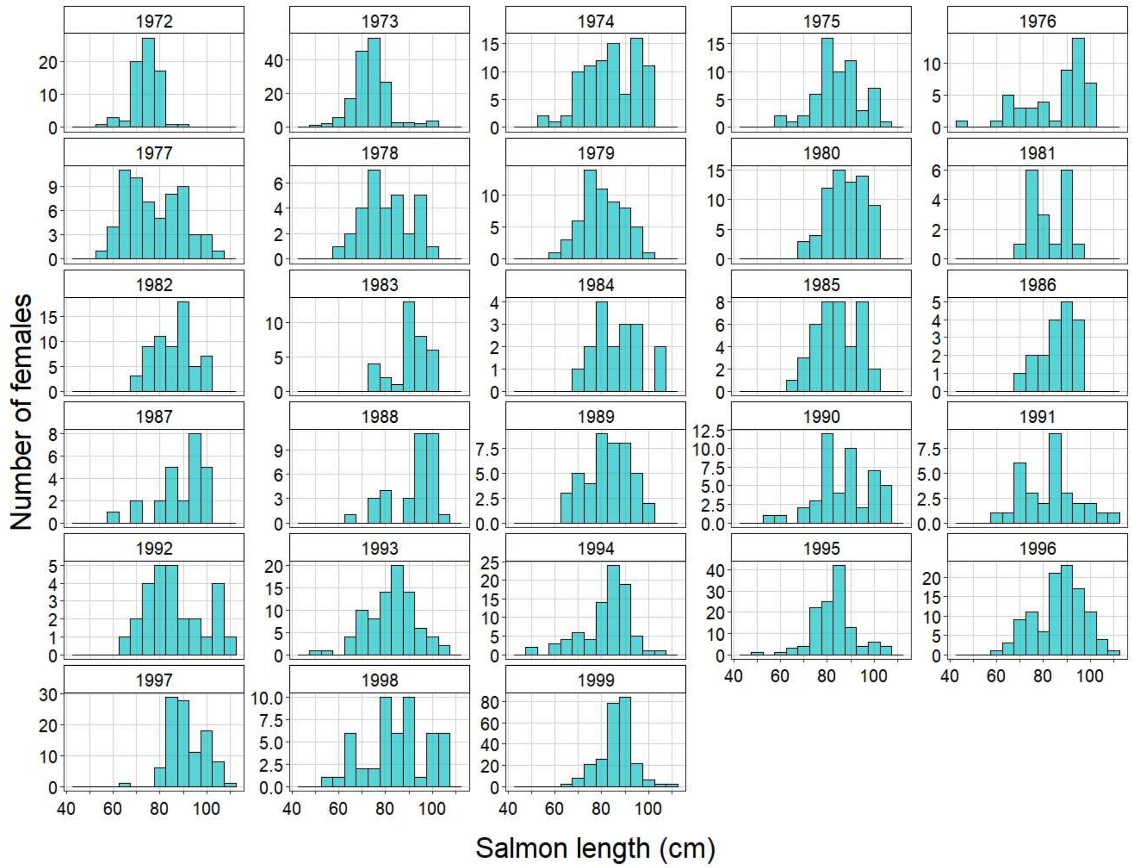

Figure S2. Annual length distributions of returning adult females with hatchery origin in the spawning run for Umeälven. Note that the y-axes are not identical among plots.

Table S1. Proportion of different sea ages among returning, hatchery reared, adult females for rivers Dalälven and Umeälven during 1998-2007. Sea age (sea winter, SW) was determined using scales obtained from adult salmon captured in permanent traps in river Dalälven and river Umeälven.

Sea age (SW)	Population	
	Dalälven	Umeälven
Proportion 1SW	0.115	0.095
Proportion 2SW	0.454	0.577
Proportion 3SW	0.427	0.326
Proportion 4SW	0.004	0.002

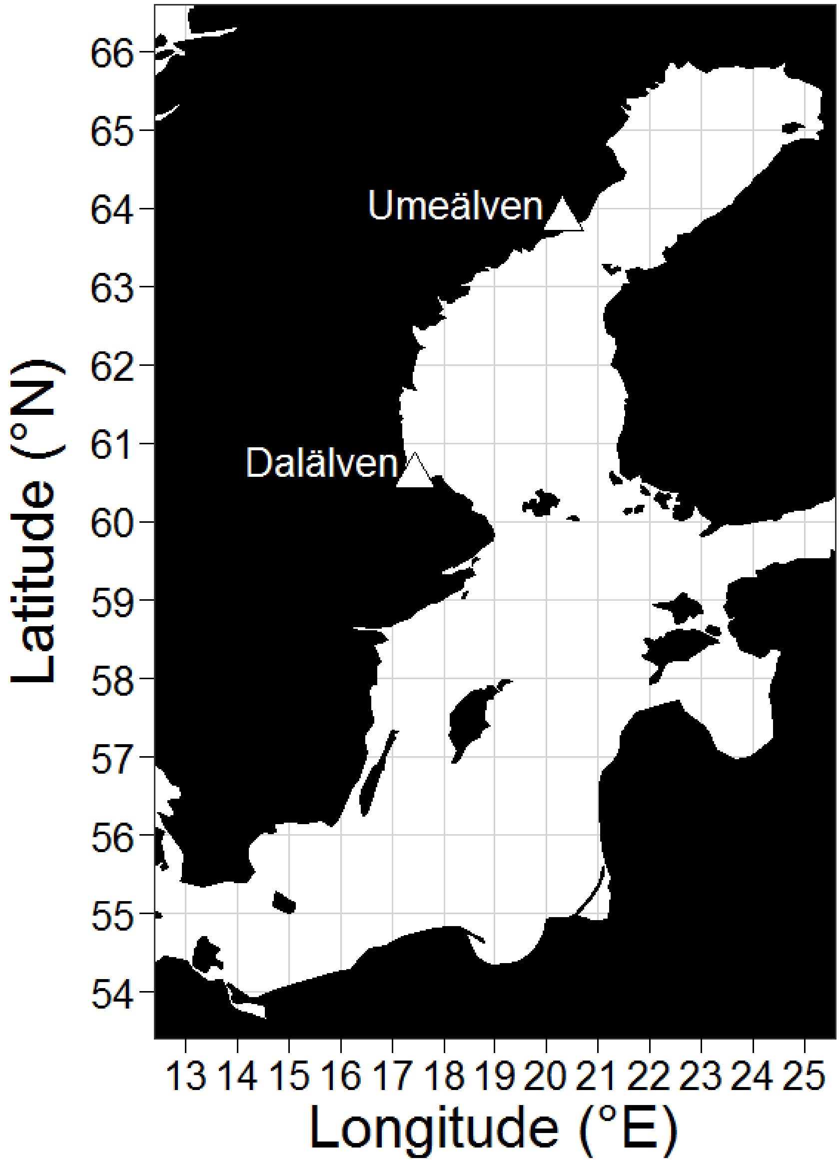

Figure S3. Map of the Baltic Sea and outlets (triangles) of the salmon rivers Dalälven and Umeälven in Sweden.

Supplement 2. Size-specific fecundity data for river Dalälven and Umeälven

Fecundity data

After adult spawners have been caught and selected in the annual broodstock fisheries in Dalälven and in Umeälven, each individual is measured, weighed, sorted and kept in large holding tanks. These holding tanks are supplied with a constant flow of river water and are regularly checked throughout the maturation period. The maturation process is monitored on a weekly basis until the end of the period, when individuals are checked daily. When females are mature and ready for stripping, each female from Dalälven is weighed and measured before and after being stripped of roe, yielding the produced roe biomass for each female. Not all eggs are stripped from the females using this method, but this error is considered to be minor and random among individuals (Petersson et al. 1996). Weighing the females before and after being stripped for roe is not done in Umeälven (Table S3).

However, mean egg size after stripping is calculated at both hatcheries via counting the number of eggs that is needed to be aligned to reach a total length of 25 cm, a traditional method commonly used in Sweden and Norway (Petersson et al. 1996). We managed to retrieve fecundity data from 1446 individual female salmon from the hatchery in Dalälven for the time period 2004-2016 (Table S2) and from 110 females from the hatchery in Umeälven for the time period 2005-2007 and 2014-2016 (Table S3).

Table S2. Number of hatchery reared female salmon individuals with available fecundity data, i.e. St 25 = the number of aligned eggs needed to reach 25 cm, produced roe biomass and mean egg size, caught in Dalälven.

Year	Number of females
2004	154
2005	132
2006	95
2007	108
2008	131
2009	137
2010	130
2011	112
2012	121
2013	105
2014	85
2015	100
2016	36

Table S3. Number of hatchery reared female salmon individuals with available fecundity data, i.e. St 25 = the number of aligned eggs needed to reach 25 cm, N eggs = number of eggs, number of eggs produced per kilogram body weight and mean egg size, caught in Umeälven.

Year	Number of females
2005	28
2006	21
2007	28
2014	4
2015	16
2016	13

Size-specific fecundity model

Both a linear and a non-linear local regression (LOESS) model was fitted to estimate a relationship between female body size and produced roe biomass using fecundity data from Dalälven (Table S2). Fecundity data from Dalälven was used as produced roe biomass has not been recorded in Umeälven (see previous section) and due to the small amount of fecundity data available for Umeälven (cf. Table S2 and S3). As the linear model predicts a negative roe biomass for salmon lengths below 60 cm while the LOESS model does not, the LOESS model was used to predict the produced roe biomass of returning salmon females in our study (Fig. S4). The LOESS model was fitted using the default R-function **loess()** with the settings *span=2* and *loess.control="direct"*, and predictions based on the fitted model was done using the default R-function **predict()**. The LOESS assumption of homogenously distributed residuals was visually assessed (Fig. S5).

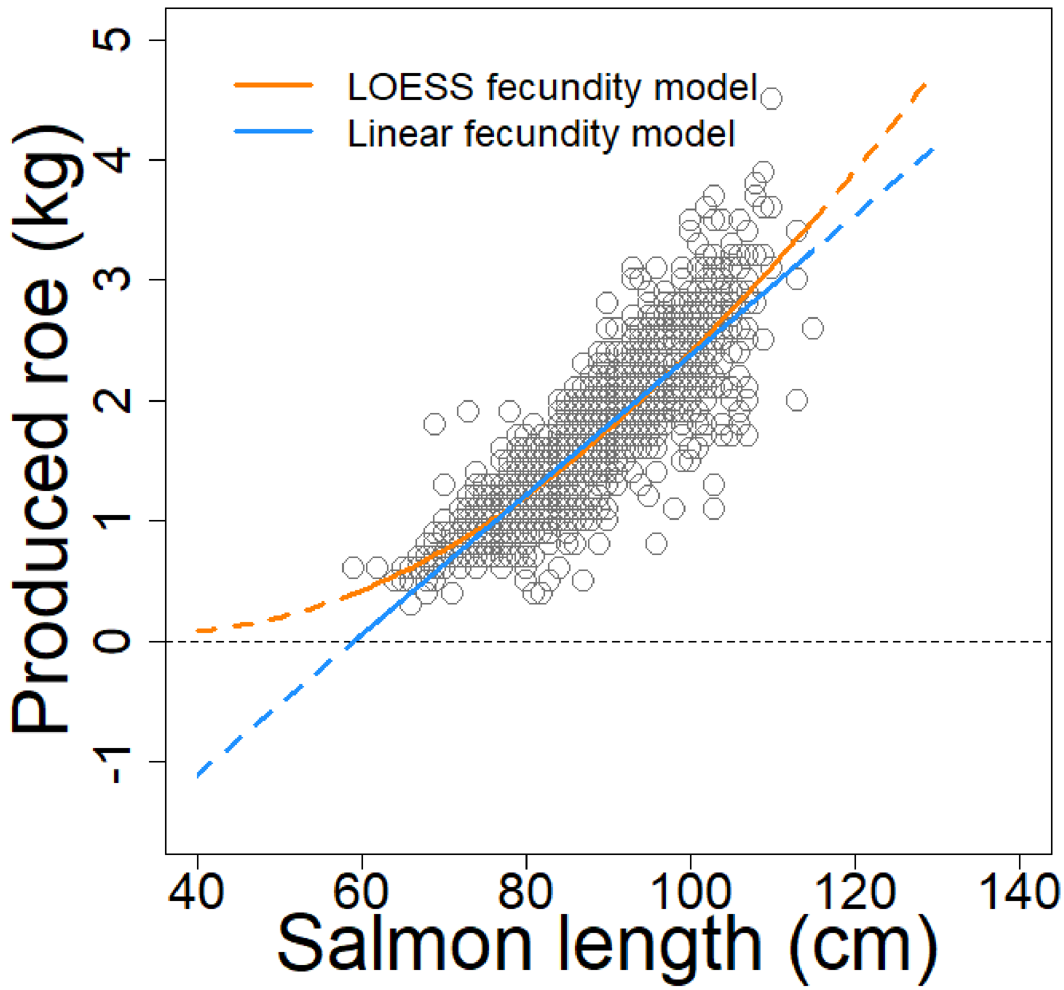

Figure S4. Estimated relationship between body size and produced roe (kg) of hatchery reared returning adult female salmon (1446 individuals) caught in Dalälven 2004-2016. Solid blue line shows the fitted linear regression model, blue dashed line shows predicted values. Solid orange line shows the fitted non-linear LOESS model while the dashed orange line shows predicted values.

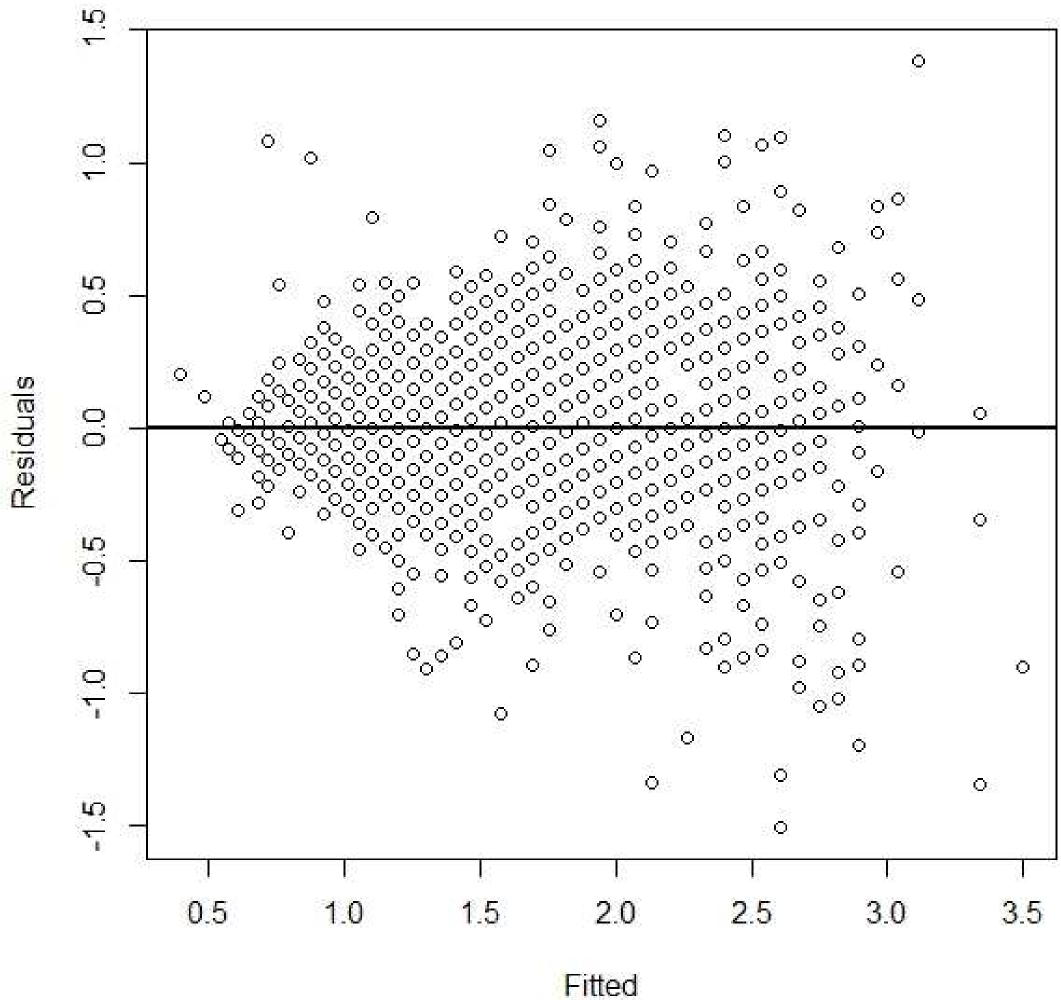

Figure S5. Residuals vs fitted values of the size-specific LOESS fecundity model.

Supplement 3. Annual number of released smolts, survival and growth at sea for smolt year classes originating from Dalälven and Umeälven

Table S4. Sample size (recaptured, tagged individuals at sea) for calculating the mean length at the end of the 1+SW (first full year at sea after being released) and 2+SW (second full year at sea after being released) growth season at sea, used for calculating the size- and smolt year-class specific growth rate at sea for salmon originating from Dalälven and Umeälven.

Release year	Dalälven		Umeälven	
	1+SW	2+SW	1+SW	2+SW
1956	-	-	10	14
1957	235	59	93	79
1958	84	38	76	66
1959	216	44	431	166
1960	181	19	91	42
1961	218	51	44	20
1962	112	31	82	45
1963	26	-	88	36
1964	130	20	43	51
1965	58	8	61	18
1966	224	76	66	55
1967	67	8	1073	502
1968	13	6	67	23
1969	24	8	88	52
1970	54	17	153	59
1971	54	5	424	195
1972	19	14	387	69
1973	34	10	114	32
1974	48	22	28	23
1975	23	16	172	115
1976	34	21	57	148
1977	99	36	80	159
1978	94	25	11	32
1979	9	9	20	99
1980	22	8	77	65
1981	23	5	25	18
1982	32	15	37	25
1983	30	13	162	126
1984	39	8	70	18
1985	49	6	53	16
1986	32	5	28	9
1987	30	-	14	10
1988	98	15	175	36
1989	101	13	50	24
1990	31	8	7	5
1991	24	-	38	-
1992	25	-	21	-
1993	17	6	8	-
1994	-	-	-	-
1995	6	-	10	-
1996	-	-	-	-
1997	-	-	8	-
Total:	**2615**	**645**	**4550**	**2452**

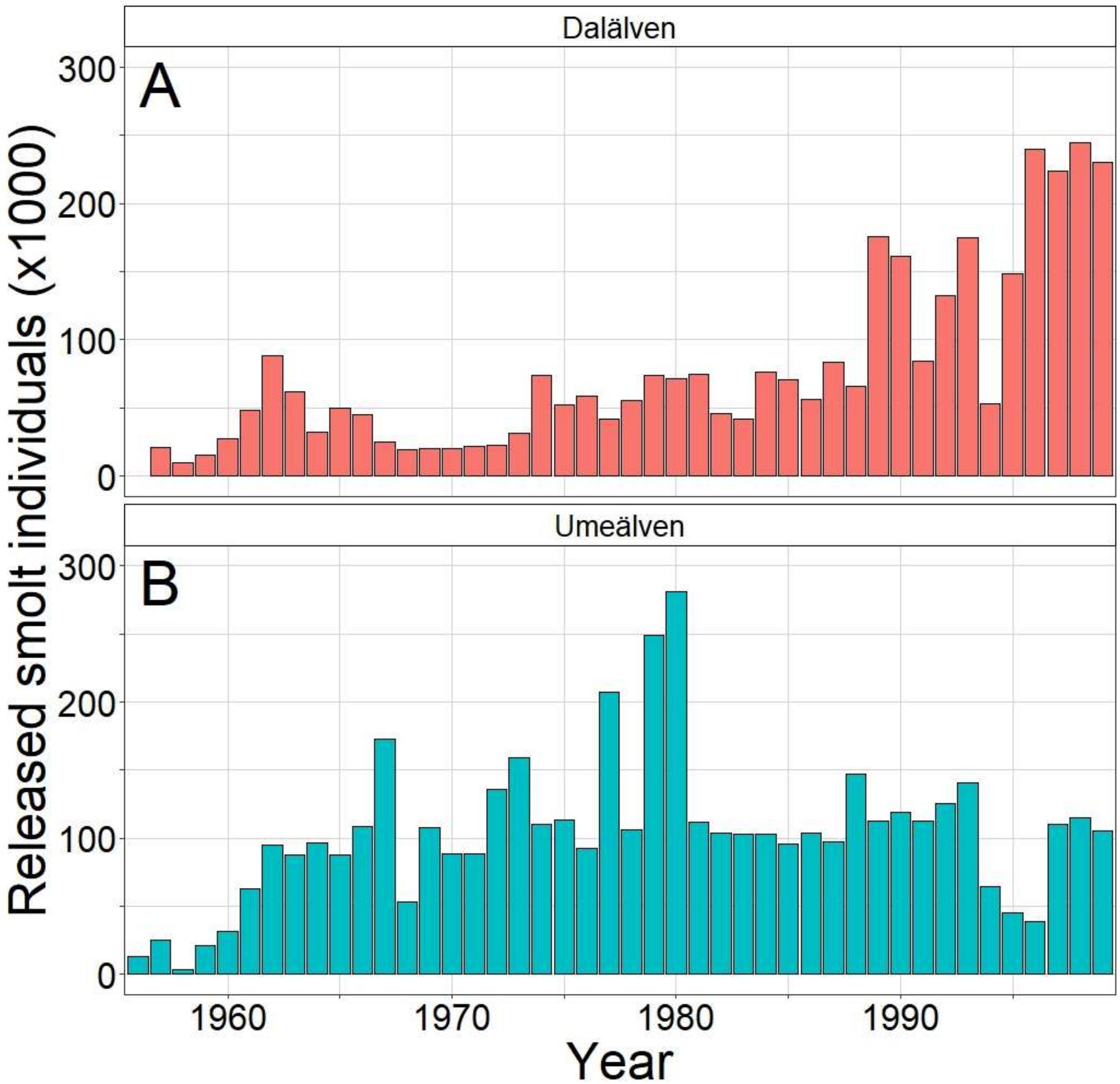

Figure S6. Annual number of released smolt individuals in (A) Dalälven and (B) Umeälven in 1956-1999.

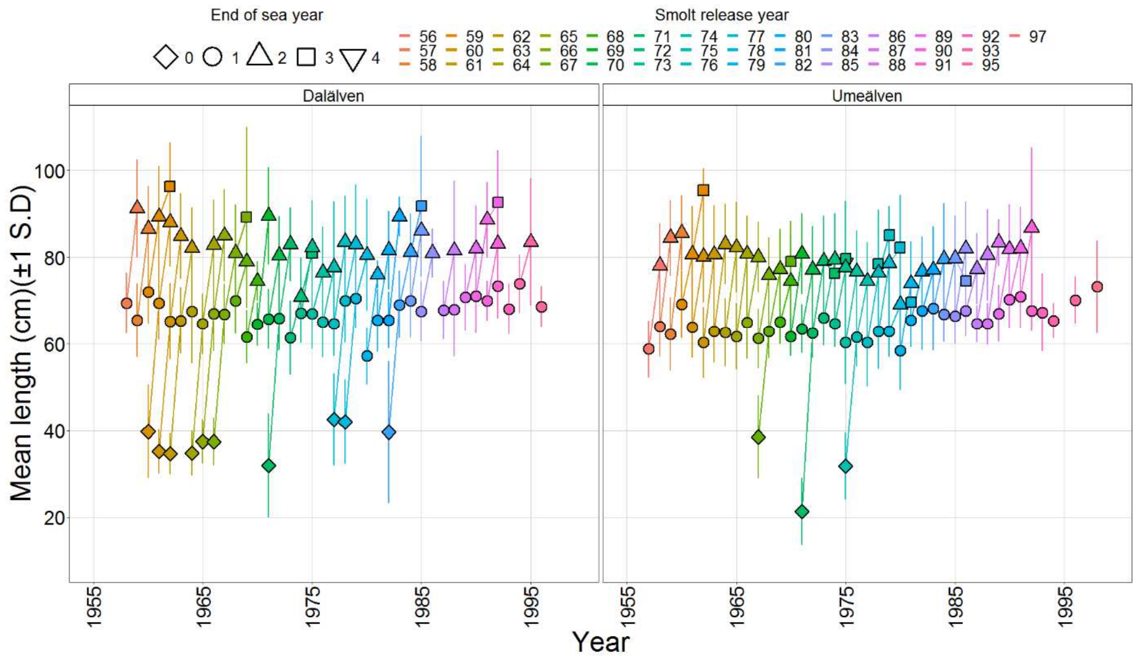

Figure S7. Smolt year-class specific mean length at the end of each sea year (based on recaptured individuals in September-December for each year at sea) for salmon originating from Dalälven (left) and Umeälven (right), respectively.

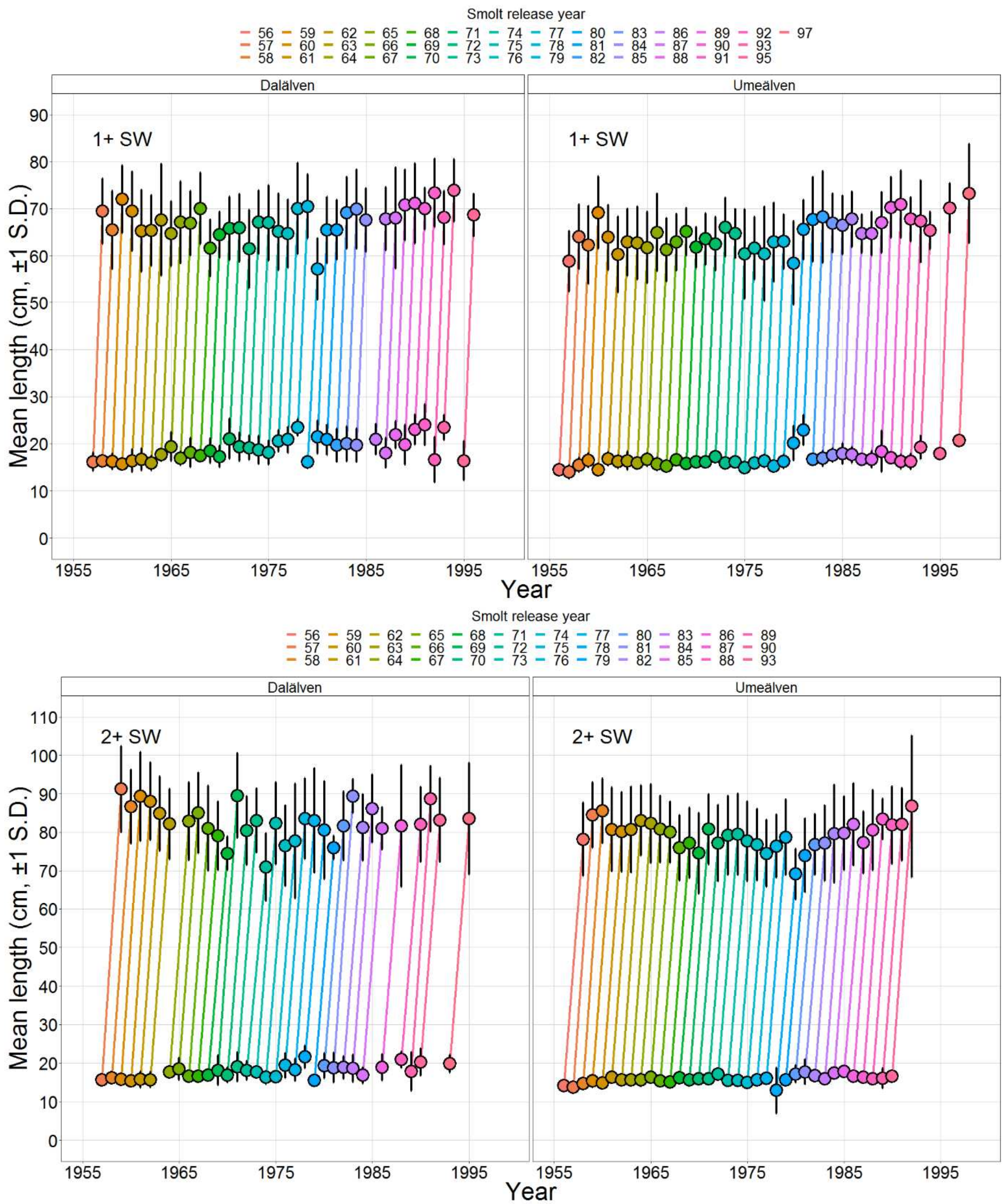

Figure S8. Upper panels show the mean length at recapture for 1+SW salmon at sea (based on recaptured individuals in September-December) and their corresponding mean length at tagging for salmon originating from Dalälven (left) and Umeälven (right). Lower panels show the mean length at recapture for 2+SW salmon at sea (based on recaptured individuals in September-December) and their corresponding mean length at tagging. Error bars denote ±1 standard deviation. Mean lengths are based on 5 or more recaptures.

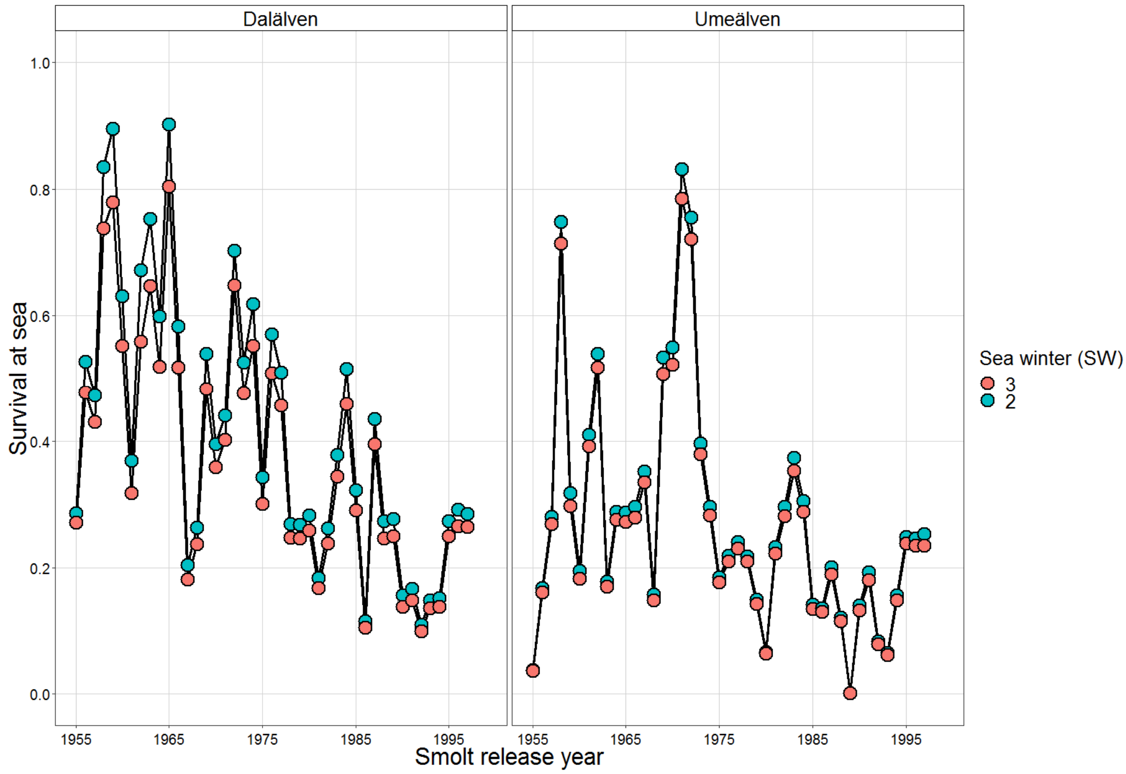

Figure S9. Smolt year-class specific survival at sea corresponding to 2SW and 3SW hatchery reared returning adult females in Dalälven and in Umeälven, estimated using the Bayesian mark-recapture model (Supplement 4).

Supplement 4 Mark-recapture model configuration

The Bayesian mark-recapture model for Carlin tagged reared Baltic salmon is a modified version of the model presented in Whitlock et al. (2016). The model for reared Baltic salmon has a 6 month time step (instead of the yearly time step used by Whitlock et al. (2016)), with seasons defined as March to August and September to February. The model was used to estimate smolt year-class specific survival rates at sea of salmon individuals aged 2SW and 3SW, for each of the rivers Dalälven and Umeälven (Supplement 5, Fig. S10). The survival at sea estimates account for both natural and fisheries mortality at sea. The estimates of the population-, sea age- and smolt year-class specific survival at sea, used in thestatistical models (see Table 1), were derived by calculating the mean of the posterior distributions of smolt year-class survival denoted $\phi^{river}_{a(r,t-1),t-1,j}$ and $\phi^{sea}_{a(r,t-1),t-1,j}$, respectively (see below; and illustrated in Supplement 5, Fig. S10). These survival rates per half-year where then used to calculate the survival until the age 2SW and 3SW for each smolt year-class and population (Eq. 1 and Eq. 2, main text). Further details of the model are provided below, and for the original model see Whitlock et al. (2016). The parameters of the prior probability distributions used are given in Table S5.

Release, migration and total survival

Time step of release (first 6 months, t=r)

The number of parr released in time step *r* to river *j* is denoted $R_{r,j}$.

The expected number of fish released in river j in time step r in their t^{th} time step is denoted $N.riv_{r,t,j}$. Likewise, $N.sea.imm_{r,t,j}$ denotes numbers of reproductively immature salmon at sea:

$$N.riv_{r,t,j} = R_{r,j}p.migr_{a(r,t)}$$

$$N.sea.imm_{r,t,j} = R_{r,j}(1 - p.migr_{a(r,t)})$$

where $p.migr_{a(r,t)}$ is the migration probability from the sea back to the river, at age a. For the release time step, it can be thought of as representing delayed out-migration to the sea and/or feeding migrations to the river, rather than spawning migrations.

Second and later time steps (t>r)

For later time steps, the numbers of surviving salmon in the river and at sea are:

$$N.surv.riv_{r,t,j} = N.riv_{i,t-1,j}\phi^{river}_{a(r,t-1),t-1,j}$$

$$N.surv.sea.imm_{r,t,j} = N.sea.imm_{i,t-1,j}\phi^{sea}_{a(r,t-1),t-1,j}$$

where:

$$N.riv_{r,t,j} = N.surv.sea.imm_{r,t,j}p.migr_{a(r,t)}$$

$$N.sea.imm_{r,t,j} = N.surv.sea.imm_{r,t,j}(1 - p.migr_{a(r,t)})$$

The Ø parameters above are probabilities of survival from both fishing and natural mortality, and used for deriving the sea-age specific and annual survival at sea estimates used in our statistical analyses. These are defined as follows:

Fisheries

$$\emptyset^{river}_{a,t,j} = \exp(-(Z^{river}_{a,t,j}))$$

$$\emptyset^{sea}_{a,t,j} = \exp(-(Z^{sea}_{a,t,j}))$$

For the first year (2 time steps), total mortality rates (Z) are calculated as:

$$Z^{sea}_{a,t,j} = \bar{F}^{sea}_{a,t,j} + Mps^{s}_{a,t,j}$$

$$Z^{river}_{a,t,j} = \bar{F}^{river}_{a,t,j} + Mps^{s}_{a,t,j}$$

and for later time steps as:

$$Z^{sea}_{a,t,j} = \bar{F}^{sea}_{a,t,j} + M^{s}_{j}$$

$$Z^{river}_{a,t,j} = \bar{F}^{river}_{a,t,j} + M^{s}_{j}$$

where $\bar{F}^{sea}_{a,t,j}$ and $\bar{F}^{river}_{a,t,j}$ are rates of total instantaneous annual fishing mortality in the sea and in the river, respectively. $Mps^{s}_{a,t,j}$ is the rate of instantaneous natural mortality for post-smolts of age a in river j in time step t (6 months). M^{s}_{j} is the rate of instantaneous natural mortality during one time step (6 months) after the first year at sea. Both are calculated from annual rates, e.g. $M^{s}_{j} = M_j/2$. Post-smolt (0+) mortality is assumed to be higher than for age 1+SW, and to follow a hierarchical distribution across years:

$$Mps_{t,j} \sim Lognormal(\mu_{Mps,}\tau_{Mps})$$

$$\tau_{Mps} = 1/\sigma_{Mps}{}^2$$

$$Mps^{s}_{1+,t,j} = Mps_{t,j}(1+\omega)/2$$

$$Mps^{s}_{2+,t,j} = Mps_{t,j}/2$$

Four fisheries are defined in the mark-recapture model as follows; $f = 1$, sea driftnets; $f = 2$, sea line gears; $f = 3$, coastal net gears; $f = 4$, coastal traps/permanent gears. The total instantaneous mortality rates for sea and coastal environments are:

$$\bar{F}^{sea}_{a,t,j} = F_{a,t,j,1} + F_{a,t,j,2} + F_{a,t,j,3} + F_{a,t,j,4}$$

Fishery selectivity

Fleet-specific rates of fishing mortality (F) above, are given as the product of an annual fishing mortality rate, seasonal multiplier, and age-based selectivity:

$$F_{a,t,j,k} = \alpha_{y(t),j,f}\beta_{s(t),j,f}Sel_{a,f}$$

where $\alpha_{y(t),j,f}$ is the rate of fishing mortality in the first season of year y; $\beta_{s(t),j,f}$ is the seasonal multiplier for season s of year y , and $Sel_{a,f}$ is the age-specific selectivity for fleet *f*. $\alpha_{y(t),j,f}$ for sea and coastal fleets ($f \in 1{:}4$) are based on a prior for the total combined sea and coastal fishing mortality rate, together with a prior for the proportion of the total mortality accounted for by each fishery:

$$\alpha_{y(t),j,f} = Ftot_{y,j}Fprop_{y,j,f},$$

where:

$$Fprop_{y,j,f}[1{:}4] \sim Dirichlet(\gamma_f[1{:}4])$$

We assume normal selectivity (*Sel*) for net gears (model fleets 1 and 3), and logistic selectivity for other fleets:

$$Sel_{a,1} = \exp(-0.5\left(\frac{a-\mu_1}{\sigma_1}\right)^2)$$

$$Sel_{a,2} = \frac{1}{1+\exp(-\upsilon_1(a-\chi_1))}$$

$$Sel_{a,3} = \exp(-0.5\left(\frac{a-\mu_2}{\sigma_2}\right)^2)$$

$$Sel_{a,4} = \frac{1}{1 + \exp(-\upsilon_2(a - \chi_2))}$$

Recapture probabilities

The probability of observing a recapture is obtained from the probability of mortality (1-exp(-$Z^{sea}_{a,t,j}$)), the probability that a fish is captured by fishery f given that it died, e.g. $\frac{F_{a,t,j,1}}{Z^{sea}_{a,t,j}}$; and the probability that the recaptured tag is reported λ. On top of this, we distinguish between tag recaptures for which location (sea or coast) but not gear information is reported and those for which location (sea or coast) was not reported, using probabilities of reporting the gear (π) and location (ψ).

To handle recaptures with missing gear and/or location information, we introduce additional "fleets": f = 5 for recaptures by unknown fleet at sea, f = 6 for recaptures by unknown coastal fleet, and f = 7 for unknown location. Fleet-specific recapture probabilities are then defined as follows:

Sea and coastal gears:

$$p_{a,t,j,1} = \frac{F_{a,t,j,1}}{Z^{sea}_{a,t,j}}(1\text{-exp(-}Z^{sea}_{a,t,j}))\lambda_1 \pi^{sea} \psi_{y(t)}$$

$$p_{a,t,j,2} = \frac{F_{a,t,j,2}}{Z^{sea}_{a,t,j}}(1\text{-exp(-}Z^{sea}_{a,t,j}))\lambda_2 \pi^{sea} \psi_{y(t)}$$

$$p_{a,t,j,3} = \frac{F_{a,t,j,3}}{Z^{sea}_{a,t,j}}(1\text{-exp(-}Z^{sea}_{a,t,j}))\lambda_1 \pi^{coast} \psi_{y(t)}$$

$$p_{a,t,j,4} = \frac{F_{a,t,j,4}}{Z^{sea}_{a,t,j}}(1\text{-exp(-}Z^{sea}_{a,t,j}))\lambda_3 \pi^{coast} \psi_{y(t)}$$

Unreported sea gear:

$$p_{a,t,j,5} = (\frac{F_{a,t,j,1}}{Z^{sea}_{a,t,j}}(1\text{-exp(-}Z^{sea}_{a,t,j}))\lambda_1 + \frac{F_{a,t,j,2}}{Z^{sea}_{a,t,j}}(1 - \exp(-Z^{sea}_{a,t,j}))\lambda_2)(1 - \pi^{sea})\psi_{y(t)}$$

Unreported coastal gear:

$$p_{a,t,j,6} = (\frac{F_{a,t,j,3}}{Z^{sea}_{a,t,j}}(1\text{-exp(-}Z^{sea}_{a,t,j}))\lambda_1 + \frac{F_{a,t,j,4}}{Z^{sea}_{a,t,j}}(1 - \exp(-Z^{sea}_{a,t,j}))\lambda_3)(1 - \pi^{coast})\psi_{y(t)}$$

Unreported gear and location:

$$p_{a,t,j,7} = (\frac{F_{a,t,j,1}}{Z^{sea}_{a,t,j}}(1\text{-exp(-}Z^{sea}_{a,t,j}))\lambda_1 + \frac{F_{a,t,j,2}}{Z^{sea}_{a,t,j}}(1 - \exp(-Z^{sea}_{a,t,j}))\lambda_2 + \frac{F_{a,t,j,3}}{Z^{sea}_{a,t,j}}(1\text{-exp(-}Z^{sea}_{a,t,j}))\lambda_1 +$$
$$\frac{F_{a,t,j,4}}{Z^{sea}_{a,t,j}}(1 - \exp(-Z^{sea}_{a,t,j}))\lambda_3)(1 - \psi_{y(t)})$$

Observation model

Expected numbers of observed recaptured tags by different fishing fleets are based on abundance of immature salmon at sea. For sea and coastal gears, ($f \in 1{:}7$) this is

$$C_{r,t,j,f} = (N.sea.imm_{r,t,j})p_{a(r,t),t,j,f}$$

The likelihood of the tag recapture data is then:

$$x_{r,1:T,j,1:7}, 1 - \sum x_{r,1:T,j,1:7} \sim Multinomial\left(R_{r,j}, \frac{C_{,1:T,j,1:7}}{R_{r,j}}, 1 - \sum \frac{C_{r,1:T,j,1:7}}{R_{r,j}}\right)$$

where $x_{r,1:T,j,1:7}$ is a vector containing the numbers of tag recaptures over the study duration ($T = 44\ (1956 - 1999)$) and fleets (f=1:7). The term $1 - \sum x_{r,1:T,j,1:7}$ gives the number of tags that were not recaptured for the population from river j.

Table S5. Priors used in the Bayesian mark-recapture model for Carlin-tagged Baltic salmon. Lognormal distributions are parameterized as Lognormal (mean of log(x), standard deviation of log(x)).

Model parameter	Prior/value	Source or rationale
$Ftot_{y,j}$	Lognormal(log(0.4),0.70)	Uninformative priors
M	Lognormal (log(0.10), 0.48)	ICES WGBAST model (ICES 2018)
$p.migr_{0+}$	Fixed at 0	
$p.migr_{1+}$	Beta(2,8)	Low prior probability for migration to river (feeding or spawning), relatively uninformative
$p.migr_{2+}$	Beta(2,8)	Low prior probability for migration to river (feeding or spawning), relatively uninformative
$p.migr_{3+}$	Beta(3,7)	Based on ICES WGBAST model (prior for 1SW salmon) (ICES 2018)
$p.migr_{4+}$	Beta(8,2)	Based on ICES WGBAST model (prior for 2SW salmon) (ICES 2018)
$p.migr_{5+}$ and older	Beta(9,1)	Based on ICES WGBAST model (prior for 3SW salmon) (ICES 2018)
$\alpha_{y(t),j,5}$	Lognormal(log(0.10),0.70)	Uninformative prior
$\beta_{1,j,f}$	Fixed to 1	
$\beta_{2,j,f}$	Lognormal(log(1),0.70)	Uninformative prior
γ_f	Set to 1/4	
λ_1	Beta(8,4)	ICES WGBAST model (ICES 2018)
λ_2	Beta(10,4)	ICES WGBAST model (ICES

		2018)
λ_3	Beta(11,9)	ICES WGBAST model (ICES 2018)
λ_4	Beta(16,6)	ICES WGBAST model (ICES 2018)
π^{coast}	Beta(1,1)	Uninformative prior
π^{sea}	Beta(1,1)	Uninformative prior
μ_1	Lognormal(log(4),0.50)	(Christensen and Larsson 1979, ICES 1980)
μ_2	Lognormal(log(4),0.70)	(Christensen and Larsson 1979, ICES 1980)
μ_{Mps}	Lognormal(log(0.20),0.70)	ICES WGBAST model (ICES 2018)
σ_1	Uniform(0.001,5)	(Christensen and Larsson 1979, ICES 1980)
σ_2	Uniform(0.001,10)	(Christensen and Larsson 1979, ICES 1980)
σ_{Mps}	Lognormal(log(0.20),0.32)	
υ_1	Lognormal(log(2.72),0.50)	(Christensen and Larsson 1979, ICES 1980)
υ_2	Lognormal(log(2.72),0.70)	Uninformative prior
υ_3	Lognormal(log(2.72),0.70)	Uninformative prior
χ_1	Lognormal(log(3),0.50)	(Christensen and Larsson 1979, ICES 1980)
χ_2	Lognormal(log(1),0.50)	Relatively uninformative prior for coastal traps (assumed to be non size- (age-) selective).
ψ_y	Beta(1,1)	Uninformative prior
ω	Beta(1,5)	Relatively uninformative prior

Supplement 5. Conceptual figures showing how survival- and growth at sea were calculated for two- and three-sea winter (2SW and 3SW) returning adult females, for each smolt year-class for the two hatchery reared Baltic populations from river Dalälven and river Umeälven.

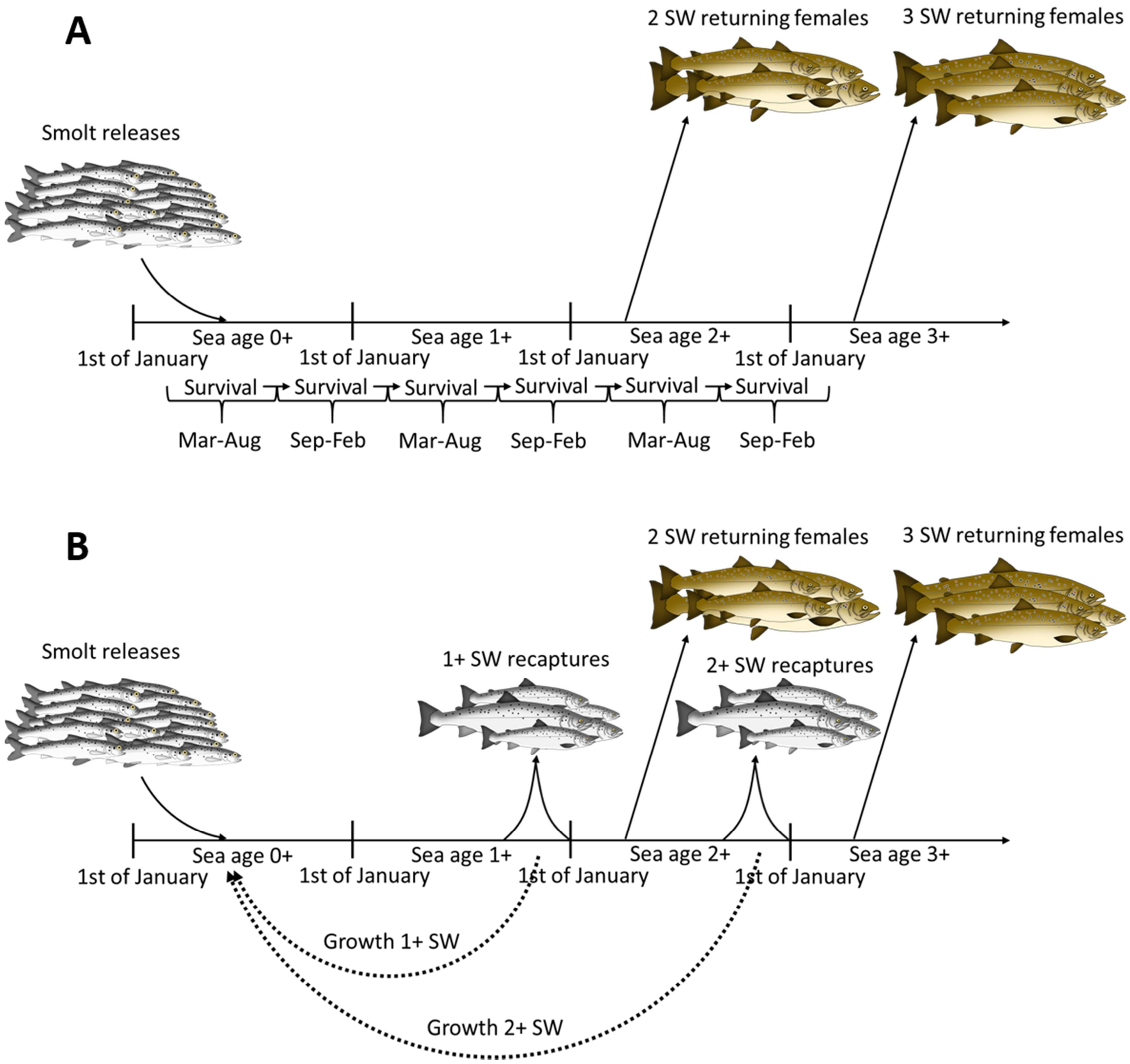

Figure S10. Conceptual figure showing how we calculated the **(a)** age-specific survival at sea and **(b)** size-specific growth for 2SW and 3SW returning adult females for each smolt year- class. For survival **(a)**, each bracket denotes the time period (half a year) for which we have one survival estimate per smolt year class (Eq. 1 and Eq. 2) estimated using our Bayesian mark-recapture model (Supplement 4). For size-specific growth at sea **(b)**, dotted arrows show when the recaptured salmon where caught, and the recaptures we use for calculating the size-specific growth at sea (Eq. 3 and Eq. 4) corresponding to 2SW and 3SW returning adult females, respectively.

Supplement 6. Model parameter estimates and model evaluation plots

Parameter estimates of the selected models (Table 1, main text) with and without growth at sea for Dalälven and Umeälven (Table S6).

Table S6. Model parameter estimates of the selected models with and without growth at sea for Dalälven and Umeälven. DWG = Dalälven with growth, D = Dalälven without growth, UWG = Umeälven with growth and U = Umeälven without growth.

Parameter	**Model**	**Estimate**	**Standard error**
Intercept	DWG	978.9	2032
	D	-178.4	172.2
	UWG	836.2	1318
	U	-3.302	24.66
Number of released smolt (Releases) 2SW	DWG	-0.0213	0.0306
	D	0.0004	0.0022
	UWG	0.0013	0.0036
	U	0.0001	0.0001
Size-specific growth (SSG) 2SW	DWG	-141.8	565.7
	D	-	-
	UWG	223.7	236.2
	U	-	-
Survival 2SW	DWG	1311	2336
	D	-287.2	321.8
	UWG	7882	4027
	U	106	50.03
Releases 3SW	DWG	-0.0153	0.0183
	D	0.0047	0.0023
	UWG	-0.0116	0.0103
	U	0.0002	0.0001
SSG 3SW	DWG	-263.2	289
	D	-	-
	UWG	-445.6	344.6
	U	-	-
Survival 3SW	DWG	5.717	2057
	D	1317	359.7
	UWG	-3399	8715
	U	0.0002	0.0001
Releases 2SW * SSG 2SW	DWG	0.0095	2057
	D	-	-
	UWG	-0.00002	0.0014
	U	-	-
Releases 2SW * Survival 2SW	DWG	-0.0279	0.0120
	D	0.0041	0.0055
	UWG	-0.0442	0.0357
	U	-	-
SSG 2SW * Survival 2SW	DWG	-523.9	833.8
	D	-	-

	UWG	-2579	1383
	U	-	-
Releases 3SW * SSG 3SW	DWG	0.0074	0.0061
	D	-	-
	UWG	0.0033	0.0027
	U	-	-
Releases 3SW * Survival 3SW	DWG	-0.0118	0.0562
	D	-0.0165	0.0065
	UWG	0.0261	0.0756
	U	-	-
SSG 3SW * Survival 3SW	DWG	464.6	566.2
	D	-	-
	UWG	958.4	2223
	U	-	-
Releases 2SW * SSG 2SW * Survival 2SW	DWG	0.0084	0.0198
	D	-	-
	UWG	0.0142	0.0127
	U	-	-
Releases 3SW * SSG 3SW * Survival 3SW	DWG	-0.0059	0.0158
	D	-	-
	UWG	-0.0074	0.0193
	U	-	-

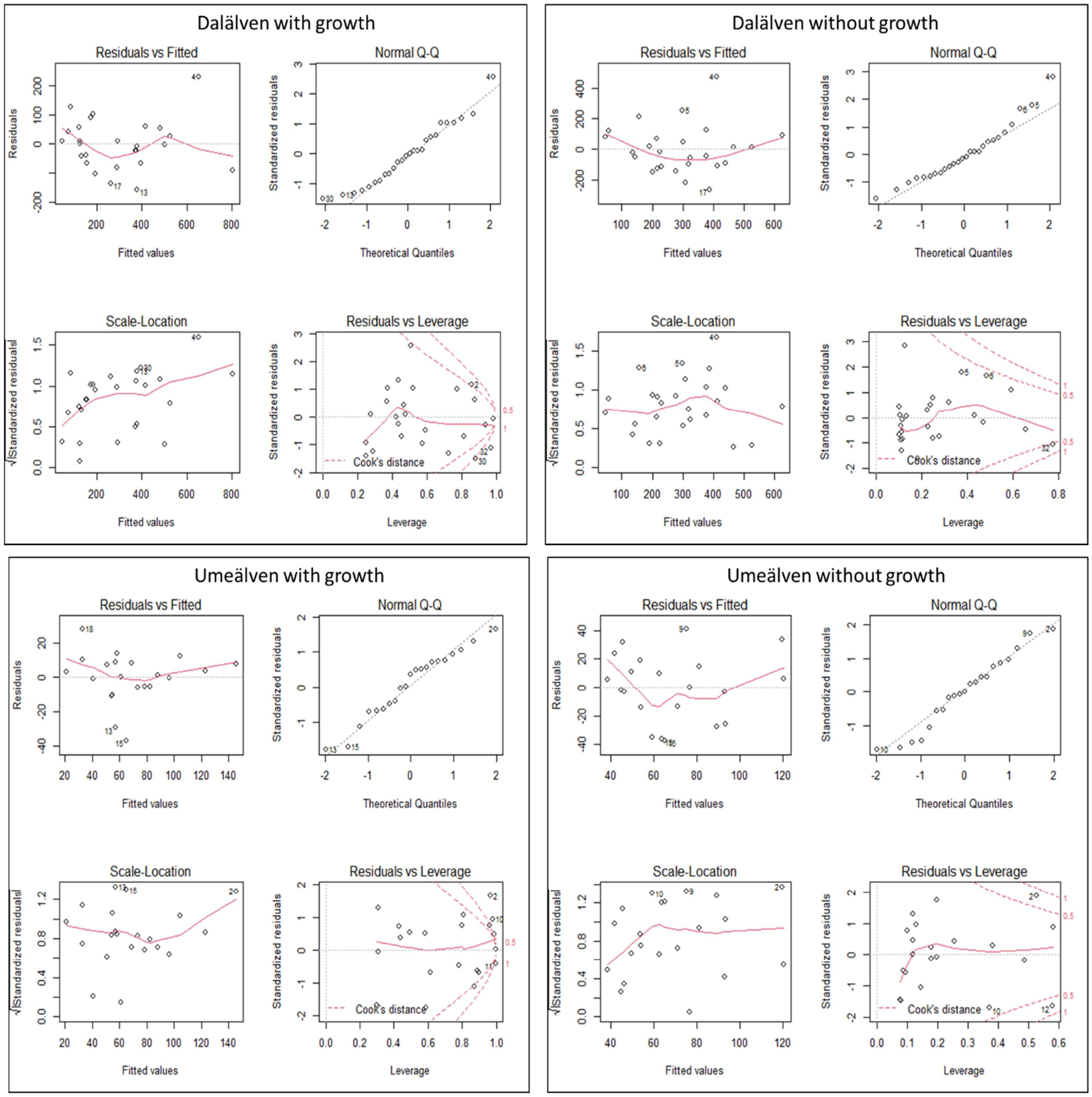

Figure S11. Model evaluation plots for selected models with and without growth at sea for Dalälven and Umeälven.

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