Table S1. Biological information pertaining to individual harbor seals tagged with Vemco VMT and GPS at Puget Sound rocky haulouts. Data provided by the Washington Department of Fish and Wildlife. NR: not recovered

Pack ID	Deployment date	Capture Location	Sex	Length cm	Weight kg	Date Recovered
2014-1	4/3/2014	Orchard Rocks	M	148	102	9/5/14
2014-2	4/4/2014	Orchard Rocks	M	145	55	9/4/14
2014-3	4/4/2014	Orchard Rocks	M	153	79	NR
2014-4	4/15/2014	Blakely Rocks	M	152	70	9/13/14
2014-5	4/18/2014	Colvos Rocks	M	154	76.5	6/23/14
2014-6	4/21/2014	Colvos Rocks	F	141	77.5	9/18/14
2014-7	4/21/2014	Colvos Rocks	F	142	93	9/2/14
2014-8	4/21/2014	Colvos Rocks	F	144	87	9/18/14
2014-9	4/21/2014	Colvos Rocks	F	134	79	9/18/14
2014-10	4/21/2014	Colvos Rocks	F	150	90	9/18/14
2014-11	4/28/2014	Colvos Rocks	M	148	78	9/12/14
2014-12	4/28/2014	Orchard Rocks	M	169	101	10/1/14
2016-1	4/6/2016	Eagle Island	M	146	94	8/28/16
2016-2	4/7/2016	Eagle Island	M	154	95	8/14/16
2016-3	4/10/2016	Orchard Rocks	F	146	75	1/20/2017
2016-4	4/11/2016	Orchard Rocks	F	157	87	9/15/2016
2016-5	4/18/2016	Nisqually	M	155	73	7/4/2016
2016-6	4/20/2016	Eagle Island	M	148	80	10/5/2016
2016-7	4/20/2016	Eagle Island	M	146	75	1/13/2016
2016-8	4/22/2016	Orchard Rocks	M	156	118	10/4/2016
2016-9	4/26/2016	Colvos Rocks	M	154	73	1/20/2017
2016-10	4/26/2016	Colvos Rocks	F	146	96	NR
2016-11	4/28/2016	Nisqually	F	144	91	9/9/2016
2016-12	4/28/2016	Nisqually	M	133	60	8/12/2016
2016-13	4/30/2016	Colvos Rocks	M	137	59	9/14/2016
2016-14	4/28/2016	Gertrude	F	147	79	8/20/2016
2016-15	4/30/2016	Colvos Rocks	F	136	91	1/3/2017
2016-16	5/5/2016	Orchard Rocks	M	153	85	9/20/2016

Text S1. CJS model comparison

Cormack-Jolly-Seber (CJS) mark–recapture models (Cormack 1964, Jolly 1965, Seber 1965) were implemented in the RMark package for R (Laake 2013) to compare models using detection data for all years (2006-2009 and 2014-2019), in addition to the linear model comparison provided in the primary analysis. Models including effects of the same variables examined in Comparison A (Puget Sound temperature (PST) in the year of migration and in the year prior to migration) and Comparison C (anchovy abundance (*A*) in the year of migration and in the year prior to migration) on Nisqually steelhead smolt survival were compared to models estimating survival by migration segment only. Detection data from the river mouth (RM) hydrophone array and the Strait of Juan de Fuca (JDF) array (described in main text) were used to populate two-segment models estimating survival (ϕ) from (1) release (REL) to RM, and (2) RM-JDF. The detection probability (*p*) portion of the model was held constant across ϕ models, using parameters to estimate variable *p* for each year (*p*(segment + year)). A value of 0.685 was fixed for *p* at JDF according to linear regression estimation methods detailed in Melnychuk (2009). The general model goodness-of-fit parameter indicated some overdispersion (Fletcher's c-hat = 1.4; Fletcher 2012), so model AIC were adjusted accordingly using the quasi-likelihood adjusted AICc (QAICc).

CJS model comparison results corroborated the results of the linear model comparison presented in the main text. PST during the year prior to steelhead migration was a strongly supported predictor of steelhead survival compared to PST during the year of migration (Δ QAICc = 11.97, Model comparison A, Table S2). The CJS model including an effect of *A* during the year prior to steelhead migration on steelhead survival also had more support than the model that included an effect of *A* during the year of migration (Δ QAICc = 3.19, Model comparison C, Table S2). The CJS model estimating ϕ only by segment showed lower levels of support than the two models including effects of PST and those including effects of *A* on steelhead smolt survival (Table S2).

Table S2. CJS model comparison results

Model comparison	Model	QAICc	Δ QAICc	weight
A	ϕ(segment x PST_{t-1})	1119.87	0.00	0.996
	ϕ(segment x PST_t)	1131.84	11.97	0.002
	ϕ(segment)	1132.32	12.45	0.001
C	ϕ(segment x A_{t-1})	1125.67	0.00	0.801
	ϕ(segment x A_t)	1128.86	3.19	0.163
	ϕ(segment)	1131.84	6.17	0.037