Ecography

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Supplementary material

Appendix 1. Random effect evaluation.

We compared models with different random effects and determined the best fit (based on AIC) was achieved with a random intercept for each individual in body condition (controlling for individuals sampled on multiple occasions). For models of fledgling body condition and stable isotopes we included a random intercept territory ID (controlling for multiple individuals sampled from the same territory). Further, following Zuur et al. (2009), we tested the need for inclusion of random effects using the “gls” and “lme” functions in the R package “nlme” with a likelihood ratio test. In all cases random effects improved model fit, except in the case of fledgling body size (likelihood ratio = 0.09, *P* = 0.78). Thus, we analyzed fledgling body size with generalized linear models.

Appendix 2. Means and standard errors (SE) of stable-carbon ($\delta^{13}C$) and –nitrogen ($\delta^{15}N$) isotope ratios in American Dipper whole blood above and below obstructions to salmon migration on the northern Olympic Peninsula, WA, USA, sampled during the 2011-2013 breeding seasons.

				$\delta^{13}C$		$\delta^{15}N$	
position	age	year	n	mean	SE	mean	SE
above obstruction	juvenile	2011	6	-26.08	0.61	5.13	0.22
		2012	22	-28.89	0.28	4.99	0.20
		2013	12	-28.65	0.41	4.81	0.16
	adult	2011	15	-28.23	0.60	5.31	0.19
		2012	36	-29.43	0.20	5.10	0.17
		2013	21	-28.01	0.35	4.56	0.14
below obstruction	juvenile	2011	NA	NA	NA	NA	NA
		2012	16	-24.92	0.43	7.60	0.53
		2013	10	-25.41	0.53	5.99	0.35
	adult	2011	13	-26.38	0.58	5.75	0.37
		2012	31	-26.11	0.27	5.90	0.23
		2013	12	-25.72	0.48	4.79	0.27

Appendix 3. Post hoc analysis of paternal effects on fledgling body size.

We explored the possibility of paternal effects on offspring body size, but found no effect on this result (Appendix A) by regressing mother's and/or father's tarsus size with fledgling tarsus size, for a subset of fledglings for which this data was available. We found weak positive trends between fledgling tarsus and mother's tarsus size for both males (adjusted $R^2 = 0.07$, n= 16, $P = 0.17$) and females (adjusted $R^2 = 0.11$, n = 17, $P = 0.11$). Thus we re-ran the analysis of fledgling body size including mothers tarsus as a covariate and including this covariate did result in a stronger effect of salmon status by sex interaction (above/below obstruction*sex: $t_{29} = -3.08$, $P = 0.005$).

Appendix 4. Estimates and standard errors (SE) for all parameters in the full Kaplan-Meyer known fate model of American dipper adult annual survival.

Parameter	stream	above/below barrier	sex	year interval	survival estimate	SE
1	Barnes Creek	above	F	2011-2012	NA	NA
2	Barnes Creek	above	F	2012-2013	0.46	0.35
3	Barnes Creek	above	F	2013-2014	0.00	0.00
4	Barnes Creek	above	M	2011-2012	NA	NA
5	Barnes Creek	above	M	2012-2013	0.52	0.35
6	Barnes Creek	above	M	2013-2014	0.45	0.23
7	Dungeness River	below	F	2011-2012	0.45	0.35
8	Dungeness River	below	F	2012-2013	0.61	0.22
9	Dungeness River	below	F	2013-2014	0.70	0.26
10	Dungeness River	below	M	2011-2012	NA	NA
11	Dungeness River	below	M	2012-2013	0.61	0.22
12	Dungeness River	below	M	2013-2014	0.68	0.27
13	Elwha River	above	F	2011-2012	0.59	0.22
14	Elwha River	above	F	2012-2013	0.88	0.11
15	Elwha River	above	F	2013-2014	0.54	0.21
16	Elwha River	below	F	2011-2012	NA	NA
17	Elwha River	below	F	2012-2013	1	0.00
18	Elwha River	below	F	2013-2014	1	0.00
19	Elwha River	above	M	2011-2012	0.32	0.17
20	Elwha River	above	M	2012-2013	0.50	0.16
21	Elwha River	above	M	2013-2014	0.48	0.20
22	Elwha River	below	M	2011-2012	NA	NA
23	Elwha River	below	M	2012-2013	NA	NA
24	Elwha River	below	M	2013-2014	1.00	0.00
25	Sol Duc River	above	F	2011-2012	NA	NA
26	Sol Duc River	above	F	2012-2013	0.55	0.25
27	Sol Duc River	above	F	2013-2014	0.00	0.00
28	Sol Duc River	below	F	2011-2012	0.53	0.33
29	Sol Duc River	below	F	2012-2013	0.37	0.16
30	Sol Duc River	below	F	2013-2014	0.61	0.18
31	Sol Duc River	above	M	2011-2012	NA	NA
32	Sol Duc River	above	M	2012-2013	0.49	0.36
33	Sol Duc River	above	M	2013-2014	0.52	0.25
34	Sol Duc River	below	M	2011-2012	1	0.00
35	Sol Duc River	below	M	2012-2013	0.66	0.14
36	Sol Duc River	below	M	2013-2014	0.60	0.14