Appendix III: Results of the representation GLMMs

Results of the generalised linear mixed-models comparing progeny representation among groups and with respect to other explanatory variables. Group was a factor with four levels: Local_{female} x Local_{male}, Local_{female} x Foreign_{male}, Foreign_{female} x Local_{male} and Foreign_{female} x Foreign_{male}. Date planted was a factor with three levels: early, mid and late. Dam and sire life-history were each two level factors (1SW versus 2SW). Results are presented as an ANOVA table based on Type II tests, with non-significant terms removed sequentially until all remaining terms were significant at the 5% level. Random effects of dam and sire were included in all models (*Dam* = variance attributable to differences among dams; *Sire* = variance attributable to sires nested within dams; *Res* = residual variance). k = dispersion parameter from the negative binomial (where the variance = $\mu + \mu^2/k$). All estimates are on log scale. Models were fitted using the glmmPQL function in the MASS library in R (Venables and Ripley 2002).

$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Life stage	Fixed effect	NumDF	DenDF	F	Р	k	Dam	Sire	Res
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Pre-flood	Intercept	1	23	371.00	< 0.001	1.28	0.57	0.71	< 0.01
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	dispersal	Group	3	23	3.61	0.029				
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		Date planted	2	23	831.73	< 0.001				
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		Non-significant terms								
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		$\operatorname{Dam} L_F$	1	21	1.57	0.224				
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		Dam life-history	1	22	1.81	0.192				
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		Sire life-history	1	21	2.48	0.131				
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		Eyed-egg diameter	1	22	0.31	0.581				
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Flood	Intercept	1	26	3131	< 0.001	13.29	0.02	0.03	0.76
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	migration	Date planted	2	23	12.74	< 0.001				
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		Non-significant terms								
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		Group	3	23	1.81	0.173				
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		$\operatorname{Dam} L_F$	1	21	1.66	0.212				
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		Dam life-history	1	22	1.02	0.324				
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		Sire life-history	1	21	0.38	0.543				
parr1Date planted Non-significant terms2233.860.036Group3231.050.390Dam L_F 1221.250.276Dam life-history1210.290.600Sire life-history1210.290.600Eyed-egg diameter1220.470.502PresmoltsIntercept126723<0.001		Eyed-egg diameter	1	22	1.02	0.323				
Date planted Non-significant terms2233.860.036Sroup3231.050.390Dam L_F 1221.250.276Dam life-history1210.290.600Sire life-history1210.290.600Eyed-egg diameter1220.470.502PresmoltsIntercept126723<0.001		Intercept	1	26	2408	< 0.001	20.8	< 0.01		1.04
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	I	Date planted	2	23	3.86	0.036				
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		Non-significant terms								
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$			3	23	1.05	0.390				
Sire life-history1210.290.600Eyed-egg diameter1220.470.502PresmoltsIntercept126723<0.001 5.30 0.59 1.36 <0.01+ smoltsDate planted223487.30<0.001 5.30 0.59 1.36 <0.01Mon-significant terms C C C C C C C C C Mathematical distribution C C C C C C C C C Adult returnsIntercept121 2.60 0.122 C C C C Adult returnsIntercept125 1.81 0.191 C C C C C Adult returnsIntercept119 253.5 <0.001 5.35 0.08 0.31 0.21 Mon-significant terms C C C C C C C C Mathematical distribution C C C C C C C C Adult returnsIntercept119 253.5 <0.001 5.35 0.08 0.31 0.21 Dam L_F 118 0.51 0.483 0.483 C C C C Dam life-history1 17 <0.001 0.985 C C C C		$\operatorname{Dam} L_F$	1	22	1.25	0.276				
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		Dam life-history	1	21	0.29	0.600				
Presmolts + smoltsIntercept126723<0.0015.300.591.36<0.01 $+$ smoltsDate planted223487.30<0.001		Sire life-history	1	21	0.29	0.600				
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		Eyed-egg diameter	1	22	0.47	0.502				
Non-significant terms221.560.001Group3221.560.228Dam L_F 1220.510.481Dam life-history1212.600.122Sire life-history1211.590.221Eyed-egg diameter1251.810.191Adult returnsIntercept119253.5<0.001	Presmolts	Intercept	1	26	723	< 0.001	5.30	0.59	1.36	< 0.01
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	+ smolts	Date planted	2	23	487.30	< 0.001				
Dam L_F 1220.510.481Dam life-history1212.600.122Sire life-history1211.590.221Eyed-egg diameter1251.810.191Adult returnsIntercept119253.5<0.001		Non-significant terms								
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		Group	3	22	1.56	0.228				
Sire life-history1211.590.221Eyed-egg diameter1251.810.191Adult returnsIntercept119253.5<0.001		$\operatorname{Dam} L_F$	1	22	0.51	0.481				
Eyed-egg diameter1251.810.191Adult returnsIntercept119253.5<0.001		Dam life-history	1	21	2.60	0.122				
Adult returns Intercept 1 19 253.5 <0.001 5.35 0.08 0.31 0.21 Group 3 9 15.90 <0.001		Sire life-history	1	21	1.59	0.221				
Group3915.90 <0.001 Non-significant termsDam L_F 1180.510.483Dam life-history117 <0.001 0.985		Eyed-egg diameter	1	25	1.81	0.191				
Non-significant terms Dam L_F 1 18 0.51 0.483 Dam life-history 1 17 <0.001	Adult returns		1	19		< 0.001	5.35	0.08	0.31	0.21
Non-significant terms Dam L_F 1 18 0.51 0.483 Dam life-history 1 17 <0.001		Group	3	9	15.90	< 0.001				
Dam L_F 1180.510.483Dam life-history117<0.001		-								
Dam life-history 1 17 <0.001 0.985			1	18	0.51	0.483				
		Sire life-history	1	7	0.89	0.376				

References:

Venables, W. N. & Ripley, B. D. (2002) Modern Applied Statistics with S. Fourth Edition. Springer, New York.