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Supplement of

Sand quarry wetlands provide high-quality habitat for native amphibians

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Section S1. Raw data for the calculation and analysis of levels of developmental instability within quarry and reference wetlands. Treat: quarry (Q) and reference (R) wetlands, Ind: individual number, Sp: amphibian species, Rep: replicate measurement number, SVL: snout-vent length, Side: side measured, and the length of the forelimb and hindlimb (as Alford et al 2007).

Treat	Ind	Sp	Rep	SVL	Side	Forelimb	Hindlimb
Q	1	Crinia	1	22.2	L	6.22	8.03
Q	1	Crinia	1	22.2	R	6.34	8.35
Q	1	Crinia	2	22.2	L	6.36	8.14
Q	1	Crinia	2	22.2	R	6.37	8.22
Q	1	Crinia	3	22.2	L	6.23	7.99
Q	1	Crinia	3	22.2	R	6.21	8.17
Q	2	Crinia	1	19.5	L	5.96	7.74
Q	2	Crinia	1	19.5	R	5.84	7.96
Q	2	Crinia	2	19.5	L	5.83	7.77
Q	2	Crinia	2	19.5	R	5.77	7.71
Q	2	Crinia	3	19.5	L	5.85	7.7
Q	2	Crinia	3	19.5	R	5.81	7.66
Q	3	Crinia	1	18.4	L	5.58	7.71
Q	3	Crinia	1	18.4	R	5.52	7.5
Q	3	Crinia	2	18.4	L	5.34	7.56
Q	3	Crinia	2	18.4	R	5.55	7.49
Q	3	Crinia	3	18.4	L	5.42	7.65
Q	3	Crinia	3	18.4	R	5.5	7.91
Q	4	Crinia	1	20.9	L	6	8.11
Q	4	Crinia	1	20.9	R	6.08	8.3
Q	4	Crinia	2	20.9	L	6.05	8.2
Q	4	Crinia	2	20.9	R	6.01	8.3
Q	4	Crinia	3	20.9	L	6.1	8
Q	4	Crinia	3	20.9	R	6.1	8.25
Q	5	Ewingii	1	25.6	L	10.1	12.55
Q	5	Ewingii	1	25.6	R	10.2	12.7
Q	5	Ewingii	2	25.6	L	10.28	12.48
Q	5	Ewingii	2	25.6	R	10.05	12.68
Q	5	Ewingii	3	25.6	L	10.3	12.6
Q	5	Ewingii	3	25.6	R	10.11	12.66
Q	6	Limno p	1	36.6	L	12.5	16.64
Q	6	Limno p	1	36.6	R	12.37	16.55
Q	6	Limno p	2	36.6	L	12.66	16.52

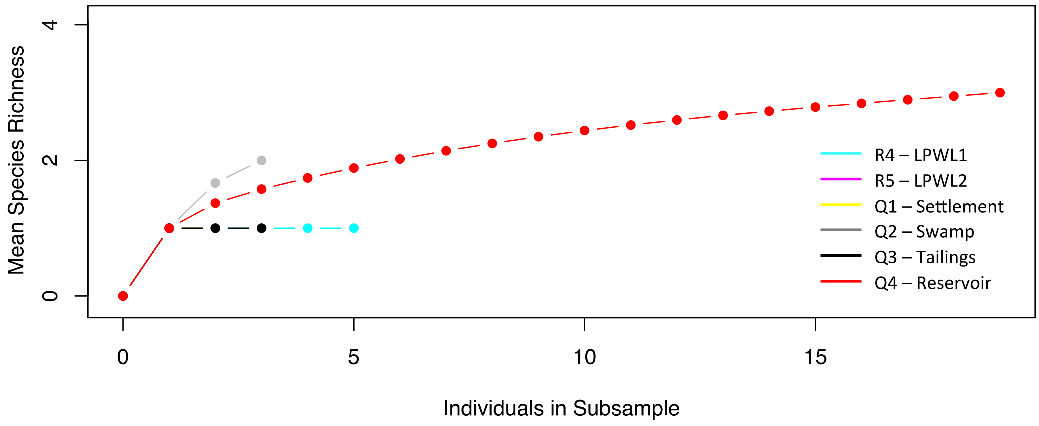
Q	6	Limno p	2	36.6	R	12.4	16.51
Q	6	Limno p	3	36.6	L	12.69	16.6
Q	6	Limno p	3	36.6	R	12.33	16.6
R	7	Crinia	1	20.5	L	6.24	8.42
R	7	Crinia	1	20.5	R	5.92	8.55
R	7	Crinia	2	20.5	L	6.18	8.35
R	7	Crinia	2	20.5	R	5.89	8.61
R	7	Crinia	3	20.5	L	6.15	8.3
R	7	Crinia	3	20.5	R	5.96	8.5
Q	8	Crinia	1	15.5	L	5.5	7.2
Q	8	Crinia	1	15.5	R	5.49	7.16
Q	8	Crinia	2	15.5	L	5.71	7.24
Q	8	Crinia	2	15.5	R	5.49	7.3
Q	8	Crinia	3	15.5	L	5.66	7.28
Q	8	Crinia	3	15.5	R	5.58	7.18
Q	9	Crinia	1	19.9	L	6.08	8.23
Q	9	Crinia	1	19.9	R	6.18	8.22
Q	9	Crinia	2	19.9	L	6.15	8.34
Q	9	Crinia	2	19.9	R	6.2	8.35
Q	9	Crinia	3	19.9	L	6.2	8.15
Q	9	Crinia	3	19.9	R	6.07	8.4
Q	10	Crinia	1	24.1	L	6.88	9.9
Q	10	Crinia	1	24.1	R	6.79	9.8
Q	10	Crinia	2	24.1	L	6.81	9.84
Q	10	Crinia	2	24.1	R	6.89	9.88
Q	10	Crinia	3	24.1	L	6.93	9.95
Q	10	Crinia	3	24.1	R	6.88	9.9
Q	11	Crinia	1	19.8	L	5.99	8.46
Q	11	Crinia	1	19.8	R	6.11	8.34
Q	11	Crinia	2	19.8	L	6.09	8.48
Q	11	Crinia	2	19.8	R	6.09	8.42
Q	11	Crinia	3	19.8	L	5.97	8.44
Q	11	Crinia	3	19.8	R	6.16	8.34
Q	12	Limno p	1	29.6	L	11.33	15.99
Q	12	Limno p	1	29.6	R	11.36	15.8
Q	12	Limno p	2	29.6	L	11.32	15.9
Q	12	Limno p	2	29.6	R	11.44	15.89
Q	12	Limno p	3	29.6	L	11.3	15.87
Q	12	Limno p	3	29.6	R	11.44	15.73
Q	13	Crinia	1	23.4	L	6.66	8.22
Q	13	Crinia	1	23.4	R	6.52	8.3
Q	13	Crinia	2	23.4	L	6.61	8.19
Q	13	Crinia	2	23.4	R	6.59	8.22
Q	13	Crinia	3	23.4	L	6.61	8.3
Q	13	Crinia	3	23.4	R	6.59	8.23
Q	14	Crinia	1	20.8	L	6.4	7.88

Q	14	Crinia	1	20.8	R	6.29	7.9
Q	14	Crinia	2	20.8	L	6.44	7.8
Q	14	Crinia	2	20.8	R	6.29	7.99
Q	14	Crinia	3	20.8	L	6.37	7.89
Q	14	Crinia	3	20.8	R	6.29	8
R	15	Crinia	1	22.2	L	6.66	8.01
R	15	Crinia	1	22.2	R	6.5	8.22
R	15	Crinia	2	22.2	L	6.7	7.99
R	15	Crinia	2	22.2	R	6.42	8.33
R	15	Crinia	3	22.2	L	6.66	8
R	15	Crinia	3	22.2	R	6.44	8.26
R	16	Crinia	1	18.7	L	5.9	7.72
R	16	Crinia	1	18.7	R	5.8	7.51
R	16	Crinia	2	18.7	L	5.84	7.79
R	16	Crinia	2	18.7	R	5.77	7.55
R	16	Crinia	3	18.7	L	5.8	7.77
R	16	Crinia	3	18.7	R	5.78	7.59
R	17	Crinia	1	19	L	6.04	8.11
R	17	Crinia	1	19	R	5.8	8.33
R	17	Crinia	2	19	L	5.99	8.16
R	17	Crinia	2	19	R	5.79	8.34
R	17	Crinia	3	19	L	5.89	8.2
R	17	Crinia	3	19	R	5.83	8.3
R	18	Crinia	1	21.1	L	6	8.33
R	18	Crinia	1	21.1	R	6.18	8.19
R	18	Crinia	2	21.1	L	6.01	8.4
R	18	Crinia	2	21.1	R	6.17	8.17
R	18	Crinia	3	21.1	L	6.1	8.36
R	18	Crinia	3	21.1	R	6.23	8.16
R	19	Crinia	1	26.1	L	7.05	10.1
R	19	Crinia	1	26.1	R	7.3	9.88
R	19	Crinia	2	26.1	L	7.11	10.19
R	19	Crinia	2	26.1	R	7.33	9.81
R	19	Crinia	3	26.1	L	7.12	10.23
R	19	Crinia	3	26.1	R	7.24	9.9

Supplement Table S1. ANOVA for determining the presence of directional asymmetry and fluctuating asymmetry plus antisymmetry for both forelimbs and hindlimbs, and for comparing levels of devlopmental instability in the Common Eastern Froglet (*Crinia signifera*) from quarry and reference wetlands (SAMPLE). A significant p-value for directional asymmetry indicates that the degree of asymmetry cannot be used as an index of DI, as the ideal degree of symmetry cannot be known (i.e. structures appear to not be ideally bilateral). A significant p-value for FA + antisymmetry indicates that measurement error is small relative to the levels of fluctuating asymmetry and antisymmetry in the data, and thus, levels of developmental instability can be compared between populations. A significant p-value for quarry *vs* reference wetlands indicatesthat levels of developmental instability are greater in one population. SIDE: left or right limbs; REP: replicate measurement number; IND: individual frog number.

		Forelimb	**Hindlimb**
Factor	**df**	**Mean Square**	
SIDE	1	0.023	0.013
REP	2	0.000	0.002
SIDE * REP	2	0.000	0.001
IND	15	1.233	3.199
SIDE * IND	15	0.025	0.041
REP * IND	30	0.003	0.006
SIDE * REP * IND	30	0.003	0.006
Directional asymmetry (MS_{SIDE} / $MS_{SIDE*IND}$)		$F_{1, 15}$ =0.93, p=0.35	$F_{1, 15}$ =0.33, p=0.58

FA + antisymmetry ($MS_{SIDE*IND}$ / $MS_{SIDE*IND*REP}$)		$F_{15, 30}$ =7.38, **p<0.001**	$F_{15, 30}$ =7.14, **p<0.001**
SAMPLE	1	0.475	1.9309
SIDE	1	0.023	0.0133
REP	2	0.000	0.0016
IND	9	1.582	4.3619
SAMPLE * SIDE	1	0.013	0.019
SAMPLE * REP	2	0.001	0.0008
SIDE * REP	2	0.000	0.0007
SAMPLE * IND	5	0.756	1.3601
SIDE * IND	9	0.019	0.0469
REP * IND	18	0.004	0.0067
SIDE * REP * IND	2	0.001	0.0018
SAMPLE * IND * SIDE	5	0.038	0.0341
SAMPLE * IND * REP	10	0.003	0.0069
SIDE * REP * IND	18	0.004	0.0046
SAMPLE * IND * SIDE * REP	10	0.003	0.0083
Quarry vs Reference ($MS_{SAMPLE*IND*SIDE}$ / $MS_{SAMPLE*IND*SIDE*REP}$)		$F_{5, 10}$ =11.78, **p<0.001**	$F_{5, 10}$ =4.11, **p=0.027**



Supplement Figure S1. Rarefaction curve for the mean species richness in relation to the number of individuals in each subsample. See Table 1 caption for definition of wetland names.