

Whisker growth dynamics in two North Pacific pinnipeds: implications for determining foraging ecology from stable isotope analysis

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Table S1. Whisker growth rates estimated from linear regressions between whisker length and time for five California sea lions (Ronan, Rio, Nemo, Sake, Cali). Values are only shown for whiskers that exhibited significant positive growth ($p \leq 0.05$). Whisker labels correspond to side of the bed (R or L), the row (A - F), and the column within the row. The minimum whisker lifespan (age) was estimated for whiskers with $r^2 > 0.5$ by dividing the maximum measured length of the whisker by the growth rate. Bolded values represent lengths and estimated lifespans calculated from the new growth of lost whiskers.

Whisker	Growth rate (mm day ⁻¹)	r^2	Max length (cm)	Whisker lifespan (years)
<i>Ronan</i>				
RD1	0.045	0.50	9.7	5.9
RE1	0.052	0.36	12.2	NA
RF1	0.041	0.74	8.1	5.4
RB2	0.004	0.26	2.4	NA
RC2	0.008	0.14	4.8	NA
RD2	0.060	0.71	9.4	4.3
RE2	0.063	0.74	9.6	4.2
RB3	0.007	0.35	2.4	NA
RD3	0.017	0.26	6.8	NA
RE3	0.031	0.42	7.3	NA
RF3	0.012	0.44	3.1	NA
RC4	0.012	0.32	3.7	NA
RD4	0.013	0.36	4.6	NA
RE4	0.007	0.20	4.1	NA
RB5	0.002	0.15	1.9	NA
RC6	0.015	0.77	2.4	4.6
RD6	0.010	0.38	2.7	NA
RE6	0.007	0.16	2.2	NA
RD7	0.005	0.20	2.2	NA
LC1	0.008	0.21	3.9	NA
LD1	0.016	0.20	8.6	NA
LE1	0.019	0.20	9.5	NA
LF1	0.033	0.67	8.0	6.6
LA2	0.016	0.76	0.7	1.3
LE2	0.014	0.19	7.9	NA
LB3	0.010	0.58	2.3	6.5
LC3	0.008	0.26	3.8	NA
LB4	0.007	0.45	2.1	NA
LC4	0.007	0.19	3.3	NA
LD4	0.006	0.24	4.1	NA
LE4	0.008	0.32	3.8	NA

Whisker	Growth rate (mm day ⁻¹)	r ²	Max length (cm)	Whisker lifespan (years)
LE5	0.007	0.24	2.9	NA
LC6	0.009	0.62	2.1	6.5
LD6	0.006	0.20	2.7	NA
LE6	0.004	0.29	1.9	NA
LD7	0.006	0.15	1.7	NA
<i>Rio</i>				
RC1	0.011	0.33	4.5	NA
RF1	0.022	0.37	4.9	NA
RC2	0.011	0.71	4.2	10.7
RF2	0.081	0.85	4.7	1.6
RC3	0.010	0.58	3.3	8.7
RD3	0.007	0.14	4.9	NA
RD5	0.006	0.16	2.8	NA
RD7	0.005	0.31	2.1	NA
LB1	0.007	0.22	2.6	NA
LC1	0.025	0.83	5.1	5.6
LD1	0.009	0.12	6.9	NA
LE1	0.031	0.76	4.3*	3.7*
LF1	0.037	0.80	5.7	4.2
LC2	0.018	0.85	4.7	7.3
LD2	0.026	0.60	6.4	6.8
LE2	0.015	0.25	6.1	NA
LF2	0.012	0.22	4.1	NA
LB3	0.030	0.66	2.1*	1.9*
LC3	0.011	0.63	4.0	10.3
LC4	0.007	0.20	3.7	NA
LC6	0.003	0.19	2.0	NA
LC7	0.024	0.79	1.1	1.3
<i>Sake</i>				
RA1	0.038	0.96	3.1	2.2
RB1	0.014	0.19	4.5	NA
RC1	0.035	0.48	12.2	NA
RE1	0.085	0.48	17.8	NA
RA2	0.014	0.69	2.1	4.0
RC2	0.106	0.96	7.0	1.8
RD2	0.067	0.53	15.0	6.1
RE2	0.099	0.74	16.1	4.5
RA3	0.008	0.49	2.3	NA
RB3	0.011	0.65	4.3	10.6
RC3	0.042	0.94	4.6	3.0
RF3	0.039	0.66	6.3	4.4
RB4	0.063	0.99	2.0	0.9
RD4	0.067	0.71	7.7	3.2
RC5	0.040	0.97	4.1	2.8
RD5	0.104	0.99	4.7	1.2
RE5	0.025	0.47	5.4	NA
RB6	0.015	0.83	2.1	3.7
RC6	0.031	0.92	4.3	3.8
RD6	0.012	0.58	4.1	9.3
RE6	0.027	0.84	3.4	3.4
RB7	0.006	0.46	1.7	NA
RC7	0.012	0.59	2.8	6.2
RD7	0.020	0.60	4.7	6.4
LC1	0.033	0.95	1.1	0.9
LF1	0.038	0.44	10.3	NA
LA2	0.005	0.46	2.2	NA
LB2	0.006	0.24	4.3	NA

Whisker	Growth rate (mm day ⁻¹)	r ²	Max length (cm)	Whisker lifespan (years)
LC2	0.176	0.99	1.4	0.2
LD2	0.033	0.18	14.4	NA
LF3	0.030	0.54	6.2	5.7
LD4	0.036	0.63	6.2	4.7
LE4	0.038	0.62	6.2	4.5
LF4	0.012	0.56	2.3	5.1
LD5	0.017	0.47	4.6	NA
LE5	0.051	0.62	5.5	3.0
LB6	0.026	0.86	2.4	2.5
LC6	0.015	0.56	3.6	6.7
LD6	0.035	0.63	4.9	3.9
<i>Nemo</i>				
RB1	0.023	0.83	4.4	5.4
RC1	0.046	0.84	6.2	3.6
RB2	0.029	0.93	5.2	4.9
RF2	0.031	0.59	10.3	9.1
RB3	0.015	0.76	6.0	10.7
RE3	0.184	0.99	7.0	1.1
RA4	0.022	0.58	1.7	2.1
RB4	0.007	0.35	5.1	NA
RB6	0.083	0.99	2.1	0.7
RC6	0.009	0.32	4.1	NA
RE7	0.049	0.63	4.5	2.5
LC1	0.043	0.59	7.2	4.6
LE1	0.087	0.47	18.3	NA
LB2	0.022	0.72	5.9	7.5
LD2	0.140	0.79	4.8	0.9
LA3	0.013	0.52	2.2	4.7
LB4	0.014	0.59	3.7	7.5
LC5	0.020	0.68	3.9	5.3
LE5	0.020	0.57	5.5	7.6
LA6	0.008	0.73	0.7	2.5
LB7	0.004	0.27	2.2	NA
LE7	0.022	0.49	3.2	NA
LC8	0.013	0.96	1.1	2.2
LE8	0.032	0.93	1.9	1.6
<i>Cali</i>				
RA1	0.016	0.55	3.0	5.1
RB1	0.044	0.61	4.3	2.7
RA2	0.021	0.56	2.7	3.6
RA3	0.011	0.61	1.8	4.5
RF3	0.095	0.83	8.0	2.3
RA5	0.017	0.64	0.9	1.5
RB5	0.018	0.48	2.5	NA
RB6	0.031	0.93	2.4	2.1
LB1	0.030	0.83	4.4	4.0
LA2	0.004	0.49	1.9	NA
LB2	0.074	0.81	5.4	2.0
LC2	0.035	0.52	10.3	8.2
LA5	0.008	0.54	1.1	3.7

*Maximum length and estimated age before whisker was lost

Table S2. Growth coefficients (K), length at asymptote, and lifespan from a von Bertalanffy growth curve model of whiskers from two spotted seals (Amak and Tunu). Whiskers that were observed over multiple complete shedding and regrowth cycles have two estimates for asymptote and lifespan.

Whisker	K (day ⁻¹)	Asym1 (cm)	Asym2 (cm)	Lif1 (days)	Life2 (days)
<i>Amak</i>					
RG1	0.027	11.1	NA	400	NA
RF1	0.010	15.1	NA	346	NA
RF5	0.034	4.4	NA	319	NA
RE1	0.025	11.3	NA	379	NA
RE4	0.033	4.3	NA	338	NA
RD1	0.025	7.4	NA	371	NA
RD3	0.042	3.4	NA	308	NA
RD4	0.057	3.0	NA	286	NA
LG1	0.021	11.0	NA	389	NA
LG2	0.027	8.6	NA	369	NA
LG3	0.017	7.7	NA	362	NA
LG4	0.024	6.0	NA	260	NA
LF1	0.010	14.8	NA	433	NA
LF2	0.018	10.4	NA	406	NA
LE1	0.011	14.0	NA	330	NA
LE2	0.023	8.4	NA	345	NA
LE4	0.048	4.4	NA	296	NA
LD1	0.019	8.1	NA	262	NA
LD2	0.025	5.3	NA	369	NA
LD3	0.070	3.3	NA	391	NA
RF4	0.038	5.2	5.6	344	NA
RF5	0.034	4.4	4.4	319	NA
RE3	0.044	4.9	5.3	357	NA
LC1	0.038	3.6	3.9	514	NA
RF2	0.020	8.3	10.0	324	273
RG5	0.029	3.0	3.3	204	363
RG4	0.033	4.9	5.3	374	376
RG2	0.021	6.9	9.1	350	385
RD2	0.037	3.9	4.4	321	392
LF3	0.024	7.1	7.8	362	303
LF4	0.043	5.1	4.4	337	273
<i>Tunu</i>					
RC1	0.049	4.8	NA	360	NA
RC2	0.068	2.9	NA	359	NA
RD3	0.062	3.6	NA	361	NA
RD4	0.042	3.3	NA	375	NA
RE2	0.047	6.6	NA	358	NA
RE3	0.045	5.6	NA	363	NA
RE4	0.046	4.5	NA	355	NA
RF4	0.051	5.3	NA	358	NA
RG4	0.049	4.2	NA	355	NA
LC1	0.040	4.8	NA	362	NA
LC2	0.066	3.2	NA	362	NA
LD1	0.032	8.4	NA	360	NA
LD2	0.040	5.8	NA	362	NA
LD3	0.055	4.1	NA	364	NA
LD4	0.047	3.5	NA	336	NA
LE2	0.023	9.3	NA	370	NA
LE3	0.031	6.5	NA	369	NA
LE4	0.029	5.4	NA	354	NA
LE5	0.037	4.1	NA	372	NA
LF3	0.023	8.1	NA	363	NA

Whisker	K (day ⁻¹)	Asym1 (cm)	Asym2 (cm)	Lifel (days)	Life2 (days)
LF5	0.035	4.9	NA	357	NA
LF7	0.057	2.7	NA	352	NA
LG4	0.034	4.9	NA	353	NA
LG3	0.027	7.2	NA	390	NA
RE1	0.011	13.5	NA	432	NA
RE6	0.042	2.8	3.1	288	272
RF6	0.038	3.1	3.4	415	325
RG2	0.053	5.2	5.1	356	286
RG3	0.026	6.7	6.7	322	384
LE1	0.013	12.2	14.0	497	361
LE6	0.053	3.0	NA	304	NA