

**Supplementary material**

**Evaluation of the effects of otolith sampling strategies and ageing error on estimation of the age composition and growth curve for Pacific bluefin tuna *Thunnus orientalis***

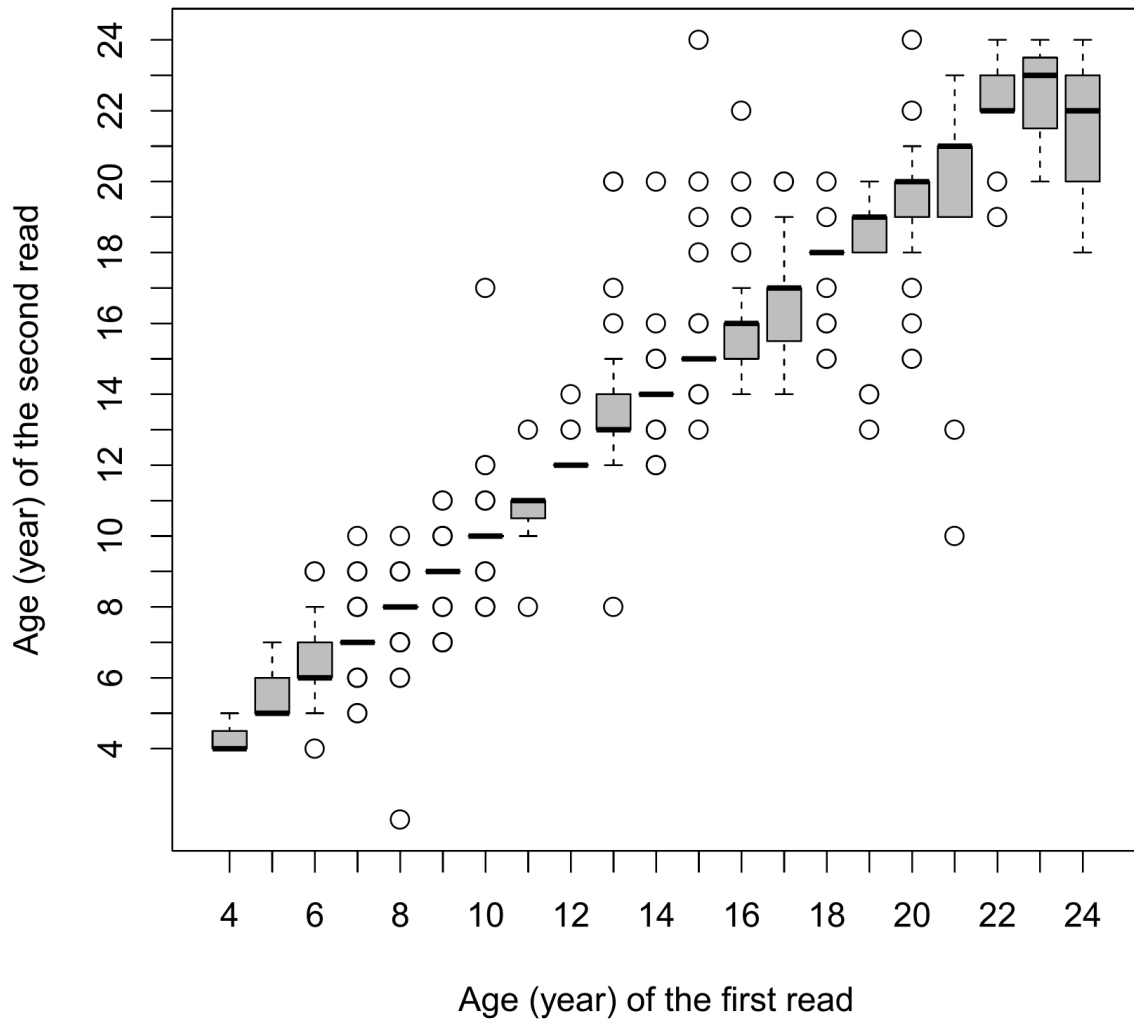
*Yi-Jay Chang*<sup>A,B,D</sup>, *Jhen Hsu*<sup>A</sup>, *Jen-Chieh Shiao*<sup>A,B</sup> and *Shui-Kai Chang*<sup>C</sup>

<sup>A</sup>Institute of Oceanography, National Taiwan University, Number 1, Section 4, Roosevelt Road, Taipei 10617, Taiwan.

<sup>B</sup>Institute of Fisheries Science, National Taiwan University, Number 1, Section 4, Roosevelt Road, Taipei 10617, Taiwan.

<sup>C</sup>Institute of Marine Affairs, National Sun Yat-sen University, 70 Lienhai Road, Kaohsiung 80424, Taiwan.

<sup>D</sup>Corresponding author. Email: [yjchang@ntu.edu.tw](mailto:yjchang@ntu.edu.tw)



**Fig. S1.** Ageing error boxplot of second age determination against the first age determination by the same reader for the otoliths of Pacific bluefin tuna (*Thunnus orientalis*) caught in the waters off Taiwan in 2015.

**Table S1. Averages and standard deviations of the sums of squares of the differences (SSD) between the estimated and ‘true’ age-frequency distributions under the combination scenarios of four otolith sampling methods (the random-otolith sampling, ROS; fixed-otolith sampling, FOS; proportional-otolith sampling, POS; and reweighting-otolith sampling, REW), six sample sizes of otolith ( $n = 100, 200, 300, 400, 500$  and  $1000$ ), five reader types of ageing error and two summary reading (the first and median) of multiple age reads**

The values are the results of 100 simulation runs

Reader	Summary reading	Sampling method	Sample size	Average of SSD	Standard deviation of SSD
Reader-I	first	ROS	100	9.17	3.59
Reader-I	first	ROS	200	4.20	1.67
Reader-I	first	ROS	300	2.53	0.88
Reader-I	first	ROS	400	1.72	0.69
Reader-I	first	ROS	500	1.38	0.52
Reader-I	first	ROS	1000	0.47	0.20
Reader-I	first	FOS	100	10.15	3.61
Reader-I	first	FOS	200	5.44	2.09
Reader-I	first	FOS	300	3.30	1.14
Reader-I	first	FOS	400	2.37	0.82
Reader-I	first	FOS	500	1.74	0.62
Reader-I	first	FOS	1000	0.73	0.30
Reader-I	first	POS	100	8.24	2.59
Reader-I	first	POS	200	3.90	1.29
Reader-I	first	POS	300	2.45	0.97
Reader-I	first	POS	400	1.78	0.67
Reader-I	first	POS	500	1.30	0.42
Reader-I	first	POS	1000	0.44	0.15
Reader-I	first	REW	100	8.42	3.04
Reader-I	first	REW	200	3.92	1.58
Reader-I	first	REW	300	2.56	0.95
Reader-I	first	REW	400	1.82	0.73
Reader-I	first	REW	500	1.55	0.61
Reader-I	first	REW	1000	0.47	0.17
Reader-II	median	ROS	100	9.78	3.74
Reader-II	median	ROS	200	3.97	1.46
Reader-II	median	ROS	300	2.59	0.98
Reader-II	median	ROS	400	1.84	0.64
Reader-II	median	ROS	500	1.42	0.52
Reader-II	median	ROS	1000	0.55	0.21
Reader-II	median	FOS	100	10.85	4.08
Reader-II	median	FOS	200	5.23	1.98
Reader-II	median	FOS	300	3.51	1.30
Reader-II	median	FOS	400	2.52	0.90
Reader-II	median	FOS	500	1.93	0.63
Reader-II	median	FOS	1000	0.76	0.25
Reader-II	median	POS	100	8.14	2.60
Reader-II	median	POS	200	4.02	1.45
Reader-II	median	POS	300	2.52	0.89
Reader-II	median	POS	400	1.63	0.61
Reader-II	median	POS	500	1.29	0.47
Reader-II	median	POS	1000	0.54	0.19
Reader-II	median	REW	100	9.63	3.81
Reader-II	median	REW	200	4.32	1.72
Reader-II	median	REW	300	2.65	1.13
Reader-II	median	REW	400	1.90	0.80
Reader-II	median	REW	500	1.41	0.45
Reader-II	median	REW	1000	0.56	0.22
Reader-II	first	ROS	100	8.87	3.29
Reader-II	first	ROS	200	4.66	1.81

Reader	Summary reading	Sampling method	Sample size	Average of SSD	Standard deviation of SSD
Reader-II	first	ROS	300	2.95	1.04
Reader-II	first	ROS	400	2.09	0.86
Reader-II	first	ROS	500	1.68	0.58
Reader-II	first	ROS	1000	0.76	0.25
Reader-II	first	FOS	100	11.01	3.90
Reader-II	first	FOS	200	5.26	1.84
Reader-II	first	FOS	300	3.67	1.19
Reader-II	first	FOS	400	2.76	0.94
Reader-II	first	FOS	500	2.23	0.78
Reader-II	first	FOS	1000	1.04	0.36
Reader-II	first	POS	100	8.66	3.29
Reader-II	first	POS	200	4.26	1.50
Reader-II	first	POS	300	2.83	1.06
Reader-II	first	POS	400	2.14	0.79
Reader-II	first	POS	500	1.80	0.56
Reader-II	first	POS	1000	0.79	0.25
Reader-II	first	REW	100	9.48	3.51
Reader-II	first	REW	200	4.78	2.12
Reader-II	first	REW	300	2.86	1.19
Reader-II	first	REW	400	2.18	0.85
Reader-II	first	REW	500	1.87	0.86
Reader-II	first	REW	1000	0.81	0.27
Reader-III	median	ROS	100	37.06	6.57
Reader-III	median	ROS	200	30.89	4.31
Reader-III	median	ROS	300	29.34	3.69
Reader-III	median	ROS	400	29.09	3.44
Reader-III	median	ROS	500	28.63	2.44
Reader-III	median	ROS	1000	27.64	1.40
Reader-III	median	FOS	100	38.16	8.37
Reader-III	median	FOS	200	31.73	4.48
Reader-III	median	FOS	300	30.28	3.75
Reader-III	median	FOS	400	29.59	3.78
Reader-III	median	FOS	500	29.18	2.84
Reader-III	median	FOS	1000	27.91	1.62
Reader-III	median	POS	100	35.52	6.85
Reader-III	median	POS	200	30.20	4.26
Reader-III	median	POS	300	29.91	3.64
Reader-III	median	POS	400	29.02	2.86
Reader-III	median	POS	500	28.72	2.47
Reader-III	median	POS	1000	27.74	1.43
Reader-III	median	REW	100	37.18	7.82
Reader-III	median	REW	200	31.69	4.87
Reader-III	median	REW	300	30.46	3.86
Reader-III	median	REW	400	29.24	3.39
Reader-III	median	REW	500	28.46	2.52
Reader-III	median	REW	1000	27.87	1.56
Reader-III	first	ROS	100	34.42	7.18
Reader-III	first	ROS	200	29.31	4.16
Reader-III	first	ROS	300	27.97	3.54
Reader-III	first	ROS	400	27.54	3.00
Reader-III	first	ROS	500	27.27	2.59
Reader-III	first	ROS	1000	26.38	1.41
Reader-III	first	FOS	100	36.44	7.62
Reader-III	first	FOS	200	31.86	4.52
Reader-III	first	FOS	300	28.75	3.53
Reader-III	first	FOS	400	28.22	2.95
Reader-III	first	FOS	500	27.22	2.57
Reader-III	first	FOS	1000	26.72	1.64
Reader-III	first	POS	100	34.60	5.97
Reader-III	first	POS	200	29.91	4.70

Reader	Summary reading	Sampling method	Sample size	Average of SSD	Standard deviation of SSD
Reader-III	first	POS	300	28.94	2.95
Reader-III	first	POS	400	27.79	2.89
Reader-III	first	POS	500	27.27	2.52
Reader-III	first	POS	1000	26.38	1.42
Reader-III	first	REW	100	35.55	7.53
Reader-III	first	REW	200	29.96	4.37
Reader-III	first	REW	300	28.47	3.48
Reader-III	first	REW	400	27.53	2.95
Reader-III	first	REW	500	27.18	3.00
Reader-III	first	REW	1000	26.32	1.47
Reader-IV	median	ROS	100	8.89	2.70
Reader-IV	median	ROS	200	4.02	1.47
Reader-IV	median	ROS	300	2.67	1.18
Reader-IV	median	ROS	400	1.87	0.71
Reader-IV	median	ROS	500	1.46	0.61
Reader-IV	median	ROS	1000	0.50	0.19
Reader-IV	median	FOS	100	10.69	3.42
Reader-IV	median	FOS	200	5.22	1.68
Reader-IV	median	FOS	300	3.50	1.35
Reader-IV	median	FOS	400	2.48	0.94
Reader-IV	median	FOS	500	1.83	0.65
Reader-IV	median	FOS	1000	0.77	0.27
Reader-IV	median	POS	100	8.68	3.68
Reader-IV	median	POS	200	4.11	1.37
Reader-IV	median	POS	300	2.61	0.99
Reader-IV	median	POS	400	1.84	0.66
Reader-IV	median	POS	500	1.46	0.45
Reader-IV	median	POS	1000	0.50	0.16
Reader-IV	median	REW	100	9.25	4.10
Reader-IV	median	REW	200	4.18	1.71
Reader-IV	median	REW	300	2.49	0.80
Reader-IV	median	REW	400	2.04	0.71
Reader-IV	median	REW	500	1.44	0.54
Reader-IV	median	REW	1000	0.58	0.23
Reader-IV	first	ROS	100	10.23	2.79
Reader-IV	first	ROS	200	5.59	1.69
Reader-IV	first	ROS	300	3.70	1.16
Reader-IV	first	ROS	400	3.35	0.87
Reader-IV	first	ROS	500	2.95	0.73
Reader-IV	first	ROS	1000	2.09	0.41
Reader-IV	first	FOS	100	11.92	3.73
Reader-IV	first	FOS	200	7.16	2.16
Reader-IV	first	FOS	300	4.96	1.60
Reader-IV	first	FOS	400	4.04	1.18
Reader-IV	first	FOS	500	3.50	1.06
Reader-IV	first	FOS	1000	2.25	0.56
Reader-IV	first	POS	100	10.72	3.36
Reader-IV	first	POS	200	5.15	1.69
Reader-IV	first	POS	300	4.03	1.20
Reader-IV	first	POS	400	3.09	0.98
Reader-IV	first	POS	500	2.85	0.86
Reader-IV	first	POS	1000	2.03	0.41
Reader-IV	first	REW	100	10.46	3.41
Reader-IV	first	REW	200	5.80	2.14
Reader-IV	first	REW	300	4.43	1.50
Reader-IV	first	REW	400	3.56	1.06
Reader-IV	first	REW	500	2.95	0.77
Reader-IV	first	REW	1000	2.16	0.49
Reader-V	median	ROS	100	34.90	7.00
Reader-V	median	ROS	200	29.87	4.10

Reader	Summary reading	Sampling method	Sample size	Average of SSD	Standard deviation of SSD
Reader-V	median	ROS	300	27.94	3.74
Reader-V	median	ROS	400	27.74	3.26
Reader-V	median	ROS	500	27.35	2.50
Reader-V	median	ROS	1000	26.37	1.39
Reader-V	median	FOS	100	36.74	8.23
Reader-V	median	FOS	200	30.13	4.22
Reader-V	median	FOS	300	28.78	3.81
Reader-V	median	FOS	400	27.97	3.57
Reader-V	median	FOS	500	27.82	3.02
Reader-V	median	FOS	1000	26.58	1.63
Reader-V	median	POS	100	34.03	6.80
Reader-V	median	POS	200	28.76	4.13
Reader-V	median	POS	300	28.55	3.74
Reader-V	median	POS	400	27.71	3.04
Reader-V	median	POS	500	27.18	2.46
Reader-V	median	POS	1000	26.35	1.50
Reader-V	median	REW	100	35.21	7.53
Reader-V	median	REW	200	29.96	4.54
Reader-V	median	REW	300	28.96	3.39
Reader-V	median	REW	400	28.20	3.17
Reader-V	median	REW	500	27.15	2.57
Reader-V	median	REW	1000	26.56	1.36
Reader-V	first	ROS	100	30.48	6.76
Reader-V	first	ROS	200	26.08	4.25
Reader-V	first	ROS	300	24.55	3.23
Reader-V	first	ROS	400	24.01	2.95
Reader-V	first	ROS	500	23.53	2.40
Reader-V	first	ROS	1000	22.67	1.33
Reader-V	first	FOS	100	32.75	6.77
Reader-V	first	FOS	200	27.74	4.25
Reader-V	first	FOS	300	25.23	3.66
Reader-V	first	FOS	400	24.54	2.78
Reader-V	first	FOS	500	23.88	2.36
Reader-V	first	FOS	1000	23.11	1.47
Reader-V	first	POS	100	30.99	6.02
Reader-V	first	POS	200	26.16	4.07
Reader-V	first	POS	300	25.39	3.01
Reader-V	first	POS	400	24.10	2.84
Reader-V	first	POS	500	23.54	2.35
Reader-V	first	POS	1000	22.65	1.43
Reader-V	first	REW	100	31.41	6.99
Reader-V	first	REW	200	26.04	4.36
Reader-V	first	REW	300	24.64	3.67
Reader-V	first	REW	400	23.76	2.88
Reader-V	first	REW	500	23.72	2.93
Reader-V	first	REW	1000	22.65	1.27

**Table S2. Averages and standard deviations of proportional error (PE) [(estimated – ‘true’) ÷ ‘true’] in the estimates of the von Bertalanffy growth function parameter  $L_{\infty}$  of Pacific bluefin tuna (*Thunnus orientalis*) under the combination scenarios of four otolith sampling methods (the random-otolith sampling, ROS; fixed-otolith sampling, FOS; proportional-otolith sampling, POS; and reweighting-otolith sampling, REW), six sample sizes of otolith ( $n = 100, 200, 300, 400, 500$  and  $1000$ ), five reader types of ageing error and two summary reading (the first and median) of multiple age reads**

The values are the results of 100 simulation runs

Reader	Summary reading	Sampling method	Sample size	Average of PE	Standard deviation of PE
Reader-I	first	ROS	100	-0.0003	0.0106
Reader-I	first	ROS	200	0.0001	0.0070
Reader-I	first	ROS	300	-0.0007	0.0060
Reader-I	first	ROS	400	0.0004	0.0051
Reader-I	first	ROS	500	0.0001	0.0040
Reader-I	first	ROS	1000	0.0001	0.0022
Reader-I	first	FOS	100	0.0410	0.0102
Reader-I	first	FOS	200	0.0412	0.0060
Reader-I	first	FOS	300	0.0412	0.0083
Reader-I	first	FOS	400	0.0404	0.0042
Reader-I	first	FOS	500	0.0403	0.0041
Reader-I	first	FOS	1000	0.0402	0.0024
Reader-I	first	POS	100	0.0025	0.0071
Reader-I	first	POS	200	-0.0001	0.0050
Reader-I	first	POS	300	0.0008	0.0040
Reader-I	first	POS	400	0.0006	0.0035
Reader-I	first	POS	500	0.0004	0.0028
Reader-I	first	POS	1000	0.0003	0.0016
Reader-I	first	REW	100	0.0100	0.0129
Reader-I	first	REW	200	0.0059	0.0060
Reader-I	first	REW	300	0.0079	0.0110
Reader-I	first	REW	400	0.0075	0.0109
Reader-I	first	REW	500	0.0068	0.0031
Reader-I	first	REW	1000	0.0079	0.0103
Reader-II	median	ROS	100	-0.0008	0.0115
Reader-II	median	ROS	200	-0.0003	0.0068
Reader-II	median	ROS	300	0.0000	0.0066
Reader-II	median	ROS	400	-0.0010	0.0047
Reader-II	median	ROS	500	0.0014	0.0117
Reader-II	median	ROS	1000	-0.0005	0.0024
Reader-II	median	FOS	100	0.0414	0.0089
Reader-II	median	FOS	200	0.0412	0.0095
Reader-II	median	FOS	300	0.0411	0.0080
Reader-II	median	FOS	400	0.0402	0.0035
Reader-II	median	FOS	500	0.0427	0.0102
Reader-II	median	FOS	1000	0.0398	0.0025
Reader-II	median	POS	100	0.0018	0.0074
Reader-II	median	POS	200	0.0004	0.0053
Reader-II	median	POS	300	0.0005	0.0038
Reader-II	median	POS	400	-0.0004	0.0031
Reader-II	median	POS	500	0.0003	0.0026
Reader-II	median	POS	1000	0.0010	0.0110
Reader-II	median	REW	100	0.0082	0.0083
Reader-II	median	REW	200	0.0070	0.0060
Reader-II	median	REW	300	0.0099	0.0148
Reader-II	median	REW	400	0.0071	0.0037

Reader	Summary reading	Sampling method	Sample size	Average of PE	Standard deviation of PE
Reader-II	median	REW	500	0.0062	0.0033
Reader-II	median	REW	1000	0.0064	0.0018
Reader-II	first	ROS	100	-0.0024	0.0119
Reader-II	first	ROS	200	-0.0025	0.0143
Reader-II	first	ROS	300	-0.0042	0.0059
Reader-II	first	ROS	400	-0.0035	0.0057
Reader-II	first	ROS	500	-0.0034	0.0044
Reader-II	first	ROS	1000	-0.0035	0.0023
Reader-II	first	FOS	100	0.0364	0.0092
Reader-II	first	FOS	200	0.0392	0.0113
Reader-II	first	FOS	300	0.0371	0.0090
Reader-II	first	FOS	400	0.0369	0.0041
Reader-II	first	FOS	500	0.0370	0.0082
Reader-II	first	FOS	1000	0.0361	0.0023
Reader-II	first	POS	100	-0.0004	0.0073
Reader-II	first	POS	200	-0.0023	0.0122
Reader-II	first	POS	300	-0.0030	0.0038
Reader-II	first	POS	400	-0.0029	0.0037
Reader-II	first	POS	500	-0.0033	0.0029
Reader-II	first	POS	1000	-0.0031	0.0015
Reader-II	first	REW	100	0.0050	0.0135
Reader-II	first	REW	200	0.0023	0.0061
Reader-II	first	REW	300	0.0039	0.0038
Reader-II	first	REW	400	0.0040	0.0111
Reader-II	first	REW	500	0.0027	0.0032
Reader-II	first	REW	1000	0.0034	0.0019
Reader-III	median	ROS	100	0.0199	0.0146
Reader-III	median	ROS	200	0.0211	0.0080
Reader-III	median	ROS	300	0.0208	0.0078
Reader-III	median	ROS	400	0.0195	0.0057
Reader-III	median	ROS	500	0.0212	0.0053
Reader-III	median	ROS	1000	0.0201	0.0029
Reader-III	median	FOS	100	0.0760	0.0115
Reader-III	median	FOS	200	0.0760	0.0095
Reader-III	median	FOS	300	0.0755	0.0061
Reader-III	median	FOS	400	0.0752	0.0055
Reader-III	median	FOS	500	0.0764	0.0050
Reader-III	median	FOS	1000	0.0744	0.0032
Reader-III	median	POS	100	0.0205	0.0082
Reader-III	median	POS	200	0.0207	0.0062
Reader-III	median	POS	300	0.0225	0.0085
Reader-III	median	POS	400	0.0208	0.0038
Reader-III	median	POS	500	0.0211	0.0035
Reader-III	median	POS	1000	0.0216	0.0089
Reader-III	median	REW	100	0.0304	0.0097
Reader-III	median	REW	200	0.0295	0.0069
Reader-III	median	REW	300	0.0294	0.0061
Reader-III	median	REW	400	0.0289	0.0044
Reader-III	median	REW	500	0.0281	0.0041
Reader-III	median	REW	1000	0.0289	0.0024
Reader-III	first	ROS	100	0.0157	0.0164
Reader-III	first	ROS	200	0.0166	0.0102
Reader-III	first	ROS	300	0.0158	0.0096
Reader-III	first	ROS	400	0.0160	0.0068
Reader-III	first	ROS	500	0.0160	0.0053
Reader-III	first	ROS	1000	0.0160	0.0027



Reader	Summary reading	Sampling method	Sample size	Average of PE	Standard deviation of PE
Reader-III	first	FOS	100	0.0691	0.0118
Reader-III	first	FOS	200	0.0702	0.0077
Reader-III	first	FOS	300	0.0689	0.0082
Reader-III	first	FOS	400	0.0696	0.0055
Reader-III	first	FOS	500	0.0688	0.0052
Reader-III	first	FOS	1000	0.0683	0.0032
Reader-III	first	POS	100	0.0194	0.0089
Reader-III	first	POS	200	0.0164	0.0061
Reader-III	first	POS	300	0.0166	0.0047
Reader-III	first	POS	400	0.0167	0.0044
Reader-III	first	POS	500	0.0163	0.0035
Reader-III	first	POS	1000	0.0165	0.0018
Reader-III	first	REW	100	0.0249	0.0106
Reader-III	first	REW	200	0.0233	0.0078
Reader-III	first	REW	300	0.0247	0.0049
Reader-III	first	REW	400	0.0237	0.0045
Reader-III	first	REW	500	0.0233	0.0040
Reader-III	first	REW	1000	0.0242	0.0024
Reader-IV	median	ROS	100	-0.0017	0.0114
Reader-IV	median	ROS	200	-0.0010	0.0070
Reader-IV	median	ROS	300	-0.0009	0.0065
Reader-IV	median	ROS	400	-0.0019	0.0047
Reader-IV	median	ROS	500	-0.0004	0.0044
Reader-IV	median	ROS	1000	-0.0014	0.0023
Reader-IV	median	FOS	100	0.0402	0.0094
Reader-IV	median	FOS	200	0.0406	0.0095
Reader-IV	median	FOS	300	0.0396	0.0046
Reader-IV	median	FOS	400	0.0407	0.0103
Reader-IV	median	FOS	500	0.0406	0.0039
Reader-IV	median	FOS	1000	0.0391	0.0025
Reader-IV	median	POS	100	-0.0009	0.0066
Reader-IV	median	POS	200	-0.0010	0.0053
Reader-IV	median	POS	300	0.0011	0.0114
Reader-IV	median	POS	400	-0.0009	0.0034
Reader-IV	median	POS	500	-0.0006	0.0029
Reader-IV	median	POS	1000	-0.0009	0.0017
Reader-IV	median	REW	100	0.0077	0.0132
Reader-IV	median	REW	200	0.0056	0.0053
Reader-IV	median	REW	300	0.0066	0.0049
Reader-IV	median	REW	400	0.0059	0.0036
Reader-IV	median	REW	500	0.0054	0.0036
Reader-IV	median	REW	1000	0.0071	0.0104
Reader-IV	first	ROS	100	-0.0081	0.0119
Reader-IV	first	ROS	200	-0.0103	0.0089
Reader-IV	first	ROS	300	-0.0099	0.0137
Reader-IV	first	ROS	400	-0.0112	0.0062
Reader-IV	first	ROS	500	-0.0114	0.0045
Reader-IV	first	ROS	1000	-0.0112	0.0025
Reader-IV	first	FOS	100	0.0283	0.0089
Reader-IV	first	FOS	200	0.0305	0.0100
Reader-IV	first	FOS	300	0.0278	0.0052
Reader-IV	first	FOS	400	0.0292	0.0094
Reader-IV	first	FOS	500	0.0280	0.0040
Reader-IV	first	FOS	1000	0.0278	0.0024
Reader-IV	first	POS	100	-0.0065	0.0077
Reader-IV	first	POS	200	-0.0093	0.0135

Reader	Summary reading	Sampling method	Sample size	Average of PE	Standard deviation of PE
Reader-IV	first	POS	300	-0.0106	0.0043
Reader-IV	first	POS	400	-0.0095	0.0125
Reader-IV	first	POS	500	-0.0097	0.0123
Reader-IV	first	POS	1000	-0.0108	0.0018
Reader-IV	first	REW	100	-0.0032	0.0085
Reader-IV	first	REW	200	-0.0040	0.0130
Reader-IV	first	REW	300	-0.0040	0.0045
Reader-IV	first	REW	400	-0.0046	0.0035
Reader-IV	first	REW	500	-0.0049	0.0037
Reader-IV	first	REW	1000	-0.0043	0.0020
Reader-V	median	ROS	100	0.0160	0.0138
Reader-V	median	ROS	200	0.0174	0.0087
Reader-V	median	ROS	300	0.0176	0.0076
Reader-V	median	ROS	400	0.0162	0.0058
Reader-V	median	ROS	500	0.0181	0.0051
Reader-V	median	ROS	1000	0.0168	0.0027
Reader-V	median	FOS	100	0.0718	0.0123
Reader-V	median	FOS	200	0.0719	0.0086
Reader-V	median	FOS	300	0.0715	0.0060
Reader-V	median	FOS	400	0.0713	0.0059
Reader-V	median	FOS	500	0.0725	0.0049
Reader-V	median	FOS	1000	0.0708	0.0035
Reader-V	median	POS	100	0.0170	0.0082
Reader-V	median	POS	200	0.0179	0.0064
Reader-V	median	POS	300	0.0186	0.0045
Reader-V	median	POS	400	0.0186	0.0098
Reader-V	median	POS	500	0.0180	0.0045
Reader-V	median	POS	1000	0.0174	0.0022
Reader-V	median	REW	100	0.0257	0.0106
Reader-V	median	REW	200	0.0257	0.0071
Reader-V	median	REW	300	0.0264	0.0061
Reader-V	median	REW	400	0.0256	0.0045
Reader-V	median	REW	500	0.0250	0.0045
Reader-V	median	REW	1000	0.0258	0.0023
Reader-V	first	ROS	100	-0.0118	0.0223
Reader-V	first	ROS	200	-0.0131	0.0138
Reader-V	first	ROS	300	-0.0127	0.0095
Reader-V	first	ROS	400	-0.0129	0.0088
Reader-V	first	ROS	500	-0.0139	0.0065
Reader-V	first	ROS	1000	-0.0128	0.0041
Reader-V	first	FOS	100	0.0345	0.0156
Reader-V	first	FOS	200	0.0359	0.0112
Reader-V	first	FOS	300	0.0336	0.0111
Reader-V	first	FOS	400	0.0337	0.0088
Reader-V	first	FOS	500	0.0330	0.0066
Reader-V	first	FOS	1000	0.0335	0.0045
Reader-V	first	POS	100	-0.0073	0.0184
Reader-V	first	POS	200	-0.0125	0.0107
Reader-V	first	POS	300	-0.0121	0.0079
Reader-V	first	POS	400	-0.0128	0.0068
Reader-V	first	POS	500	-0.0125	0.0051
Reader-V	first	POS	1000	-0.0129	0.0032
Reader-V	first	REW	100	-0.0047	0.0152
Reader-V	first	REW	200	-0.0070	0.0108
Reader-V	first	REW	300	-0.0053	0.0082
Reader-V	first	REW	400	-0.0056	0.0068

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Reader	Summary reading	Sampling method	Sample size	Average of PE	Standard deviation of PE
Reader-V	first	REW	500	-0.0058	0.0066
Reader-V	first	REW	1000	-0.0057	0.0033

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**Table S3. Averages and standard deviations of proportional error (PE) [(estimated – ‘true’) ÷ ‘true’] in the estimates of the von Bertalanffy growth function parameter *K* of Pacific bluefin tuna (*Thunnus orientalis*) under the combination scenarios of four otolith sampling methods (the random-otolith sampling, ROS; fixed-otolith sampling, FOS; proportional-otolith sampling, POS; and reweighting-otolith sampling, REW), six sample sizes of otolith (*n* = 100, 200, 300, 400, 500 and 1000), five reader types of ageing error and two summary reading (the first and median) of multiple age reads**

The values are the results of 100 simulation runs

Reader	Summary reading	Sampling method	Sample size	Average of PE	Standard deviation of PE
Reader-I	first	ROS	100	0.0014	0.0479
Reader-I	first	ROS	200	-0.0003	0.0324
Reader-I	first	ROS	300	0.0042	0.0284
Reader-I	first	ROS	400	-0.0009	0.0225
Reader-I	first	ROS	500	0.0011	0.0209
Reader-I	first	ROS	1000	-0.0001	0.0095
Reader-I	first	FOS	100	-0.1480	0.0314
Reader-I	first	FOS	200	-0.1485	0.0170
Reader-I	first	FOS	300	-0.1461	0.0185
Reader-I	first	FOS	400	-0.1457	0.0124
Reader-I	first	FOS	500	-0.1452	0.0135
Reader-I	first	FOS	1000	-0.1456	0.0075
Reader-I	first	POS	100	-0.0036	0.0370
Reader-I	first	POS	200	0.0003	0.0266
Reader-I	first	POS	300	-0.0033	0.0201
Reader-I	first	POS	400	-0.0038	0.0158
Reader-I	first	POS	500	-0.0004	0.0151
Reader-I	first	POS	1000	-0.0009	0.0082
Reader-I	first	REW	100	-0.0401	0.0479
Reader-I	first	REW	200	-0.0266	0.0301
Reader-I	first	REW	300	-0.0325	0.0308
Reader-I	first	REW	400	-0.0311	0.0306
Reader-I	first	REW	500	-0.0283	0.0152
Reader-I	first	REW	1000	-0.0328	0.0254
Reader-II	median	ROS	100	0.0017	0.0488
Reader-II	median	ROS	200	0.0035	0.0319
Reader-II	median	ROS	300	0.0028	0.0293
Reader-II	median	ROS	400	0.0061	0.0231
Reader-II	median	ROS	500	-0.0028	0.0334
Reader-II	median	ROS	1000	0.0018	0.0116
Reader-II	median	FOS	100	-0.1515	0.0269
Reader-II	median	FOS	200	-0.1491	0.0227
Reader-II	median	FOS	300	-0.1474	0.0198
Reader-II	median	FOS	400	-0.1465	0.0111
Reader-II	median	FOS	500	-0.1522	0.0208
Reader-II	median	FOS	1000	-0.1461	0.0083
Reader-II	median	POS	100	-0.0016	0.0377
Reader-II	median	POS	200	-0.0022	0.0268
Reader-II	median	POS	300	-0.0020	0.0205
Reader-II	median	POS	400	0.0023	0.0154
Reader-II	median	POS	500	-0.0006	0.0136
Reader-II	median	POS	1000	-0.0027	0.0271
Reader-II	median	REW	100	-0.0308	0.0405
Reader-II	median	REW	200	-0.0291	0.0290
Reader-II	median	REW	300	-0.0375	0.0387
Reader-II	median	REW	400	-0.0311	0.0182

Reader	Summary reading	Sampling method	Sample size	Average of PE	Standard deviation of PE
Reader-II	median	REW	500	-0.0291	0.0154
Reader-II	median	REW	1000	-0.0278	0.0094
Reader-II	first	ROS	100	0.0114	0.0524
Reader-II	first	ROS	200	0.0178	0.0494
Reader-II	first	ROS	300	0.0213	0.0266
Reader-II	first	ROS	400	0.0159	0.0261
Reader-II	first	ROS	500	0.0169	0.0211
Reader-II	first	ROS	1000	0.0157	0.0118
Reader-II	first	FOS	100	-0.1363	0.0305
Reader-II	first	FOS	200	-0.1418	0.0263
Reader-II	first	FOS	300	-0.1351	0.0220
Reader-II	first	FOS	400	-0.1375	0.0124
Reader-II	first	FOS	500	-0.1359	0.0187
Reader-II	first	FOS	1000	-0.1352	0.0086
Reader-II	first	POS	100	0.0087	0.0369
Reader-II	first	POS	200	0.0131	0.0394
Reader-II	first	POS	300	0.0144	0.0204
Reader-II	first	POS	400	0.0137	0.0194
Reader-II	first	POS	500	0.0164	0.0166
Reader-II	first	POS	1000	0.0146	0.0083
Reader-II	first	REW	100	-0.0185	0.0523
Reader-II	first	REW	200	-0.0108	0.0311
Reader-II	first	REW	300	-0.0165	0.0197
Reader-II	first	REW	400	-0.0143	0.0315
Reader-II	first	REW	500	-0.0103	0.0176
Reader-II	first	REW	1000	-0.0151	0.0099
Reader-III	median	ROS	100	-0.2127	0.0441
Reader-III	median	ROS	200	-0.2160	0.0245
Reader-III	median	ROS	300	-0.2144	0.0231
Reader-III	median	ROS	400	-0.2112	0.0185
Reader-III	median	ROS	500	-0.2165	0.0165
Reader-III	median	ROS	1000	-0.2146	0.0093
Reader-III	median	FOS	100	-0.3499	0.0204
Reader-III	median	FOS	200	-0.3490	0.0160
Reader-III	median	FOS	300	-0.3474	0.0121
Reader-III	median	FOS	400	-0.3475	0.0098
Reader-III	median	FOS	500	-0.3498	0.0096
Reader-III	median	FOS	1000	-0.3467	0.0064
Reader-III	median	POS	100	-0.2136	0.0272
Reader-III	median	POS	200	-0.2161	0.0200
Reader-III	median	POS	300	-0.2212	0.0194
Reader-III	median	POS	400	-0.2174	0.0124
Reader-III	median	POS	500	-0.2176	0.0106
Reader-III	median	POS	1000	-0.2180	0.0171
Reader-III	median	REW	100	-0.2435	0.0285
Reader-III	median	REW	200	-0.2405	0.0221
Reader-III	median	REW	300	-0.2422	0.0185
Reader-III	median	REW	400	-0.2397	0.0129
Reader-III	median	REW	500	-0.2391	0.0122
Reader-III	median	REW	1000	-0.2413	0.0072
Reader-III	first	ROS	100	-0.1961	0.0529
Reader-III	first	ROS	200	-0.1997	0.0318
Reader-III	first	ROS	300	-0.1993	0.0247
Reader-III	first	ROS	400	-0.2021	0.0208
Reader-III	first	ROS	500	-0.2007	0.0168
Reader-III	first	ROS	1000	-0.2024	0.0091

Reader	Summary reading	Sampling method	Sample size	Average of PE	Standard deviation of PE
Reader-III first		FOS	100	-0.3365	0.0242
Reader-III first		FOS	200	-0.3379	0.0154
Reader-III first		FOS	300	-0.3346	0.0156
Reader-III first		FOS	400	-0.3373	0.0103
Reader-III first		FOS	500	-0.3351	0.0110
Reader-III first		FOS	1000	-0.3350	0.0070
Reader-III first		POS	100	-0.2058	0.0297
Reader-III first		POS	200	-0.2030	0.0211
Reader-III first		POS	300	-0.2033	0.0164
Reader-III first		POS	400	-0.2036	0.0145
Reader-III first		POS	500	-0.2019	0.0124
Reader-III first		POS	1000	-0.2030	0.0064
Reader-III first		REW	100	-0.2279	0.0356
Reader-III first		REW	200	-0.2250	0.0247
Reader-III first		REW	300	-0.2281	0.0162
Reader-III first		REW	400	-0.2248	0.0154
Reader-III first		REW	500	-0.2235	0.0136
Reader-III first		REW	1000	-0.2272	0.0078
Reader-IV median		ROS	100	0.0063	0.0484
Reader-IV median		ROS	200	0.0081	0.0335
Reader-IV median		ROS	300	0.0076	0.0295
Reader-IV median		ROS	400	0.0115	0.0233
Reader-IV median		ROS	500	0.0040	0.0205
Reader-IV median		ROS	1000	0.0062	0.0117
Reader-IV median		FOS	100	-0.1479	0.0280
Reader-IV median		FOS	200	-0.1472	0.0234
Reader-IV median		FOS	300	-0.1433	0.0156
Reader-IV median		FOS	400	-0.1462	0.0206
Reader-IV median		FOS	500	-0.1474	0.0126
Reader-IV median		FOS	1000	-0.1436	0.0085
Reader-IV median		POS	100	0.0069	0.0356
Reader-IV median		POS	200	0.0050	0.0271
Reader-IV median		POS	300	-0.0030	0.0328
Reader-IV median		POS	400	0.0026	0.0171
Reader-IV median		POS	500	0.0028	0.0141
Reader-IV median		POS	1000	0.0043	0.0095
Reader-IV median		REW	100	-0.0313	0.0472
Reader-IV median		REW	200	-0.0247	0.0273
Reader-IV median		REW	300	-0.0284	0.0231
Reader-IV median		REW	400	-0.0248	0.0172
Reader-IV median		REW	500	-0.0230	0.0179
Reader-IV median		REW	1000	-0.0289	0.0260
Reader-IV first		ROS	100	0.0378	0.0546
Reader-IV first		ROS	200	0.0523	0.0433
Reader-IV first		ROS	300	0.0549	0.0440
Reader-IV first		ROS	400	0.0558	0.0307
Reader-IV first		ROS	500	0.0604	0.0241
Reader-IV first		ROS	1000	0.0567	0.0145
Reader-IV first		FOS	100	-0.1111	0.0333
Reader-IV first		FOS	200	-0.1151	0.0271
Reader-IV first		FOS	300	-0.1060	0.0191
Reader-IV first		FOS	400	-0.1115	0.0228
Reader-IV first		FOS	500	-0.1079	0.0151
Reader-IV first		FOS	1000	-0.1087	0.0094
Reader-IV first		POS	100	0.0379	0.0406
Reader-IV first		POS	200	0.0497	0.0453

Reader	Summary reading	Sampling method	Sample size	Average of PE	Standard deviation of PE
Reader-IV	first	POS	300	0.0545	0.0249
Reader-IV	first	POS	400	0.0526	0.0380
Reader-IV	first	POS	500	0.0547	0.0356
Reader-IV	first	POS	1000	0.0564	0.0106
Reader-IV	first	REW	100	0.0180	0.0493
Reader-IV	first	REW	200	0.0245	0.0436
Reader-IV	first	REW	300	0.0238	0.0251
Reader-IV	first	REW	400	0.0276	0.0239
Reader-IV	first	REW	500	0.0291	0.0230
Reader-IV	first	REW	1000	0.0245	0.0116
Reader-V	median	ROS	100	-0.1995	0.0437
Reader-V	median	ROS	200	-0.2034	0.0287
Reader-V	median	ROS	300	-0.2035	0.0235
Reader-V	median	ROS	400	-0.2005	0.0189
Reader-V	median	ROS	500	-0.2062	0.0165
Reader-V	median	ROS	1000	-0.2039	0.0091
Reader-V	median	FOS	100	-0.3422	0.0228
Reader-V	median	FOS	200	-0.3417	0.0156
Reader-V	median	FOS	300	-0.3402	0.0124
Reader-V	median	FOS	400	-0.3402	0.0103
Reader-V	median	FOS	500	-0.3429	0.0096
Reader-V	median	FOS	1000	-0.3400	0.0072
Reader-V	median	POS	100	-0.2020	0.0283
Reader-V	median	POS	200	-0.2068	0.0213
Reader-V	median	POS	300	-0.2094	0.0152
Reader-V	median	POS	400	-0.2092	0.0215
Reader-V	median	POS	500	-0.2072	0.0124
Reader-V	median	POS	1000	-0.2053	0.0077
Reader-V	median	REW	100	-0.2292	0.0354
Reader-V	median	REW	200	-0.2308	0.0222
Reader-V	median	REW	300	-0.2326	0.0186
Reader-V	median	REW	400	-0.2299	0.0133
Reader-V	median	REW	500	-0.2284	0.0144
Reader-V	median	REW	1000	-0.2310	0.0078
Reader-V	first	ROS	100	-0.0770	0.0982
Reader-V	first	ROS	200	-0.0757	0.0729
Reader-V	first	ROS	300	-0.0834	0.0446
Reader-V	first	ROS	400	-0.0855	0.0412
Reader-V	first	ROS	500	-0.0783	0.0316
Reader-V	first	ROS	1000	-0.0868	0.0206
Reader-V	first	FOS	100	-0.2567	0.0463
Reader-V	first	FOS	200	-0.2594	0.0323
Reader-V	first	FOS	300	-0.2525	0.0282
Reader-V	first	FOS	400	-0.2552	0.0245
Reader-V	first	FOS	500	-0.2525	0.0193
Reader-V	first	FOS	1000	-0.2553	0.0131
Reader-V	first	POS	100	-0.0938	0.0813
Reader-V	first	POS	200	-0.0850	0.0581
Reader-V	first	POS	300	-0.0881	0.0374
Reader-V	first	POS	400	-0.0852	0.0342
Reader-V	first	POS	500	-0.0860	0.0254
Reader-V	first	POS	1000	-0.0853	0.0154
Reader-V	first	REW	100	-0.1108	0.0785
Reader-V	first	REW	200	-0.1062	0.0536
Reader-V	first	REW	300	-0.1136	0.0393
Reader-V	first	REW	400	-0.1118	0.0362

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Reader	Summary reading	Sampling method	Sample size	Average of PE	Standard deviation of PE
Reader-V	first	REW	500	-0.1118	0.0326
Reader-V	first	REW	1000	-0.1135	0.0154

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**Table S4. Average of total percentage deviations of predicted lengths of Pacific bluefin tuna (*Thunnus orientalis*) under the combination scenarios of four otolith sampling methods (the random-otolith sampling, ROS; fixed-otolith sampling, FOS; proportional-otolith sampling, POS; and reweighting-otolith sampling, REW), six sample sizes of otolith ( $n = 100, 200, 300, 400, 500$  and  $1000$ ), five reader types of ageing error and two summary reading (the first and median) of multiple age reads**

The values are the results of 100 simulation runs

Reader	Summary reading	Sampling method	Sample size	Average of total percentage errors of predicted lengths
Reader-I	first	ROS	100	0.17
Reader-I	first	ROS	200	0.11
Reader-I	first	ROS	300	0.09
Reader-I	first	ROS	400	0.08
Reader-I	first	ROS	500	0.07
Reader-I	first	ROS	1000	0.04
Reader-I	first	FOS	100	0.58
Reader-I	first	FOS	200	0.58
Reader-I	first	FOS	300	0.58
Reader-I	first	FOS	400	0.57
Reader-I	first	FOS	500	0.57
Reader-I	first	FOS	1000	0.57
Reader-I	first	POS	100	0.13
Reader-I	first	POS	200	0.08
Reader-I	first	POS	300	0.07
Reader-I	first	POS	400	0.06
Reader-I	first	POS	500	0.05
Reader-I	first	POS	1000	0.03
Reader-I	first	REW	100	0.19
Reader-I	first	REW	200	0.12
Reader-I	first	REW	300	0.13
Reader-I	first	REW	400	0.12
Reader-I	first	REW	500	0.11
Reader-I	first	REW	1000	0.12
Reader-II	median	ROS	100	0.18
Reader-II	median	ROS	200	0.11
Reader-II	median	ROS	300	0.10
Reader-II	median	ROS	400	0.08
Reader-II	median	ROS	500	0.08
Reader-II	median	ROS	1000	0.04
Reader-II	median	FOS	100	0.59
Reader-II	median	FOS	200	0.58
Reader-II	median	FOS	300	0.58
Reader-II	median	FOS	400	0.57
Reader-II	median	FOS	500	0.60
Reader-II	median	FOS	1000	0.56
Reader-II	median	POS	100	0.13
Reader-II	median	POS	200	0.08
Reader-II	median	POS	300	0.07
Reader-II	median	POS	400	0.05
Reader-II	median	POS	500	0.05
Reader-II	median	POS	1000	0.04
Reader-II	median	REW	100	0.17
Reader-II	median	REW	200	0.13
Reader-II	median	REW	300	0.15
Reader-II	median	REW	400	0.12
Reader-II	median	REW	500	0.10
Reader-II	median	REW	1000	0.10
Reader-II	first	ROS	100	0.18
Reader-II	first	ROS	200	0.15

Reader	Summary reading	Sampling method	Sample size	Average of total percentage errors of predicted lengths
Reader-II	first	ROS	300	0.11
Reader-II	first	ROS	400	0.10
Reader-II	first	ROS	500	0.08
Reader-II	first	ROS	1000	0.06
Reader-II	first	FOS	100	0.53
Reader-II	first	FOS	200	0.55
Reader-II	first	FOS	300	0.52
Reader-II	first	FOS	400	0.53
Reader-II	first	FOS	500	0.52
Reader-II	first	FOS	1000	0.51
Reader-II	first	POS	100	0.13
Reader-II	first	POS	200	0.12
Reader-II	first	POS	300	0.08
Reader-II	first	POS	400	0.07
Reader-II	first	POS	500	0.07
Reader-II	first	POS	1000	0.05
Reader-II	first	REW	100	0.16
Reader-II	first	REW	200	0.10
Reader-II	first	REW	300	0.08
Reader-II	first	REW	400	0.09
Reader-II	first	REW	500	0.07
Reader-II	first	REW	1000	0.06
Reader-III	median	ROS	100	0.90
Reader-III	median	ROS	200	0.87
Reader-III	median	ROS	300	0.86
Reader-III	median	ROS	400	0.85
Reader-III	median	ROS	500	0.87
Reader-III	median	ROS	1000	0.86
Reader-III	median	FOS	100	1.41
Reader-III	median	FOS	200	1.40
Reader-III	median	FOS	300	1.39
Reader-III	median	FOS	400	1.39
Reader-III	median	FOS	500	1.40
Reader-III	median	FOS	1000	1.38
Reader-III	median	POS	100	0.87
Reader-III	median	POS	200	0.87
Reader-III	median	POS	300	0.89
Reader-III	median	POS	400	0.87
Reader-III	median	POS	500	0.87
Reader-III	median	POS	1000	0.87
Reader-III	median	REW	100	0.96
Reader-III	median	REW	200	0.94
Reader-III	median	REW	300	0.95
Reader-III	median	REW	400	0.94
Reader-III	median	REW	500	0.94
Reader-III	median	REW	1000	0.94
Reader-III	first	ROS	100	0.87
Reader-III	first	ROS	200	0.84
Reader-III	first	ROS	300	0.84
Reader-III	first	ROS	400	0.85
Reader-III	first	ROS	500	0.83
Reader-III	first	ROS	1000	0.83
Reader-III	first	FOS	100	1.34
Reader-III	first	FOS	200	1.34
Reader-III	first	FOS	300	1.33
Reader-III	first	FOS	400	1.34
Reader-III	first	FOS	500	1.33
Reader-III	first	FOS	1000	1.33
Reader-III	first	POS	100	0.83
Reader-III	first	POS	200	0.84

Reader	Summary reading	Sampling method	Sample size	Average of total percentage errors of predicted lengths
Reader-III	first	POS	300	0.84
Reader-III	first	POS	400	0.84
Reader-III	first	POS	500	0.83
Reader-III	first	POS	1000	0.83
Reader-III	first	REW	100	0.92
Reader-III	first	REW	200	0.90
Reader-III	first	REW	300	0.90
Reader-III	first	REW	400	0.89
Reader-III	first	REW	500	0.89
Reader-III	first	REW	1000	0.90
Reader-IV	median	ROS	100	0.17
Reader-IV	median	ROS	200	0.12
Reader-IV	median	ROS	300	0.10
Reader-IV	median	ROS	400	0.08
Reader-IV	median	ROS	500	0.07
Reader-IV	median	ROS	1000	0.04
Reader-IV	median	FOS	100	0.57
Reader-IV	median	FOS	200	0.57
Reader-IV	median	FOS	300	0.56
Reader-IV	median	FOS	400	0.57
Reader-IV	median	FOS	500	0.57
Reader-IV	median	FOS	1000	0.55
Reader-IV	median	POS	100	0.12
Reader-IV	median	POS	200	0.09
Reader-IV	median	POS	300	0.08
Reader-IV	median	POS	400	0.06
Reader-IV	median	POS	500	0.05
Reader-IV	median	POS	1000	0.03
Reader-IV	median	REW	100	0.17
Reader-IV	median	REW	200	0.12
Reader-IV	median	REW	300	0.12
Reader-IV	median	REW	400	0.10
Reader-IV	median	REW	500	0.09
Reader-IV	median	REW	1000	0.11
Reader-IV	first	ROS	100	0.20
Reader-IV	first	ROS	200	0.20
Reader-IV	first	ROS	300	0.21
Reader-IV	first	ROS	400	0.19
Reader-IV	first	ROS	500	0.19
Reader-IV	first	ROS	1000	0.18
Reader-IV	first	FOS	100	0.42
Reader-IV	first	FOS	200	0.44
Reader-IV	first	FOS	300	0.40
Reader-IV	first	FOS	400	0.42
Reader-IV	first	FOS	500	0.41
Reader-IV	first	FOS	1000	0.40
Reader-IV	first	POS	100	0.17
Reader-IV	first	POS	200	0.20
Reader-IV	first	POS	300	0.18
Reader-IV	first	POS	400	0.19
Reader-IV	first	POS	500	0.19
Reader-IV	first	POS	1000	0.18
Reader-IV	first	REW	100	0.15
Reader-IV	first	REW	200	0.14
Reader-IV	first	REW	300	0.10
Reader-IV	first	REW	400	0.10
Reader-IV	first	REW	500	0.10
Reader-IV	first	REW	1000	0.08
Reader-V	median	ROS	100	0.87
Reader-V	median	ROS	200	0.84

Reader	Summary reading	Sampling method	Sample size	Average of total percentage errors of predicted lengths
Reader-V	median	ROS	300	0.84
Reader-V	median	ROS	400	0.83
Reader-V	median	ROS	500	0.84
Reader-V	median	ROS	1000	0.83
Reader-V	median	FOS	100	1.37
Reader-V	median	FOS	200	1.36
Reader-V	median	FOS	300	1.35
Reader-V	median	FOS	400	1.35
Reader-V	median	FOS	500	1.37
Reader-V	median	FOS	1000	1.35
Reader-V	median	POS	100	0.84
Reader-V	median	POS	200	0.85
Reader-V	median	POS	300	0.85
Reader-V	median	POS	400	0.85
Reader-V	median	POS	500	0.84
Reader-V	median	POS	1000	0.83
Reader-V	median	REW	100	0.92
Reader-V	median	REW	200	0.91
Reader-V	median	REW	300	0.92
Reader-V	median	REW	400	0.90
Reader-V	median	REW	500	0.90
Reader-V	median	REW	1000	0.91
Reader-V	first	ROS	100	0.77
Reader-V	first	ROS	200	0.74
Reader-V	first	ROS	300	0.74
Reader-V	first	ROS	400	0.76
Reader-V	first	ROS	500	0.74
Reader-V	first	ROS	1000	0.75
Reader-V	first	FOS	100	1.03
Reader-V	first	FOS	200	1.02
Reader-V	first	FOS	300	0.99
Reader-V	first	FOS	400	1.00
Reader-V	first	FOS	500	0.99
Reader-V	first	FOS	1000	1.00
Reader-V	first	POS	100	0.72
Reader-V	first	POS	200	0.76
Reader-V	first	POS	300	0.75
Reader-V	first	POS	400	0.75
Reader-V	first	POS	500	0.74
Reader-V	first	POS	1000	0.75
Reader-V	first	REW	100	0.74
Reader-V	first	REW	200	0.74
Reader-V	first	REW	300	0.73
Reader-V	first	REW	400	0.72
Reader-V	first	REW	500	0.73
Reader-V	first	REW	1000	0.73