

Supplementary materials *Eucera longicornis*

Table S1: The number of males and females caught and the recapture number for Aggregation 1 per sampling day for all years. Total caught and re-caught for that year are shown. No males were caught in 2017 due to survey occurring outside of male flight period.

Year	Date	Females caught	Female recaptures	Male caught	Male recaptures
2017	13 June	5	0	-	-
	14 June	11	1	-	-
	20 June	13	3	-	-
	30 June	13	4	-	-
	1 July	11	6	-	-
	Total	53	14	-	-
2018	26 May	3	0	55	0
	1 June	3	0	43	7
	10 June	16	2	11	3
	15 June	19	0	8	4
	22 June	26	8	4	2
	28 June	27	3	0	0
	6 July	13	3	0	0
	11 July	9	3	0	0
	Total	116	19	121	19
2019	21 May	0	0	23	0
	27 May	11	0	38	9
	1 June	26	0	12	8
	9 June	31	4	5	5
	17 June	32	8	0	0
	21 June	29	8	0	0
	27 June	29	9	0	0
	1 July	23	7	0	0
	4 July	27	11	0	0
	8 July	27	18	0	0
	11 July	28	17	0	0
	Total	263	82	78	22

Table S2: The number of males and females caught and the recapture number for Aggregation 2 per sampling day for all years. Total caught and re-caught for that year are shown. No males were caught in 2017 due to survey occurring outside of male flight period.

Year	Date	Females caught	Female recaptures	Male caught	Male recaptures
2017	15 June	3	0	-	-
	16 June	8	0	-	-
	21 June	5	3	-	-
	2 July	5	2	-	-
	4 July	2	2	-	-
	Total	23	7	-	-
2018	25 May	2	0	17	0
	4 June	9	0	10	1
	8 June	21	3	5	3
	12 June	13	2	6	3
	21 June	17	5	5	5
	26 June	21	11	0	0
	04 July	19	9	0	0
	8 July	4	4	0	0
	Total	106	34	43	12
2019	23 May	4	0	17	0
	30 May	19	1	3	3
	5 June	12	1	1	4
	11 June	11	2	4	0
	20 June	9	3	0	0
	24 June	11	4	0	0
	28 June	13	4	0	0
	2 July	6	3	0	0
	5 July	6	2	0	0
	9 July	9	5	0	0
	13 July	7	7	0	0
	Total	107	32	25	7

Table S3: Models used to calculate population estimates for both aggregations and all years.

Models for each sex were calculated separately and model assumptions were tested using goodness of fit. Models were chosen based on AICc values and deviance. Due to sampling later in the flight season in 2017 no male captured occurred.

Aggregation 1					
Year	Sex	Model	No. of parameters	AICc	Deviance
2017	F	Phi{.}, p{.}, pent{t}	6	110.9	-71.7
2018	M	Phi{.}, p{t}, pent{t}	8	151.8	-192.8
	F	Phi{.}, p{.}, pent{t}	10	181.6	-307.2
2019	M	Phi{.}, p{.}, pent{t}	5	133.4	-70.8
	F	Phi{.}, p{.}, pent{t}	11	578.1	-628.1
Aggregation 2					
2017	F	Phi{.}, p{.}, pent{t}	6	64.1	-5.42
2018	M	Phi{.}, p{t}, pent{t}	9	122.4	-26.9
	F	Phi{.}, p{.}, pent{.}	7	250.3	-172.1
2019	M	Phi{.}, p{.}, pent{t}	6	66.5	-31.0
	F	Phi{.}, p{.}, pent{t}	10	271.5	-190.1

Table S4: **Real parameter estimates of acceptable Jolly-Seber (POPAN) models:** apparent survival (Φ), capture probability (p) and entrance probability (pent) are presented. For 2017 due to only female recaptures both aggregation 1 and 2 are presented in the same table. For 2018 and 2019 model outputs are presented separately for each aggregation showing both female and male model parameters.

1- 2017 Females									
a) Aggregation 1					b) Aggregation 2				
Parameter	Estimate	SE	95% Confidence Interval		Parameter	Estimate	SE	95% Confidence Interval	
			Lower	Upper				Lower	Upper
Phi1	0.98	0.03	0.82	1.00	Phi1	0.89	0.05	0.75	0.95
p1	0.30	0.09	0.15	0.51	p1	0.55	0.21	0.18	0.87
Pent 1	0.23	0.194	0.03	0.72	Pent1	0.57	0.57	0.20	0.87
Pent2	0.25	0.20	0.04	0.73	Pent2	0	0	0	1.00
Pent3	0.16	0.18	0.01	0.73	Pent3	0.17	0.17	0.05	0.46
N	55.50	9.11	44.2	82.6	N	20.9	20.9	16.9	41.9

2- 2018 Aggregation 1									
a) Females					b) Males				
Parameter	Estimate	SE	95% Confidence Interval		Parameter	Estimate	SE	95% Confidence Interval	
			Lower	Upper				Lower	Upper
Phi1	0.91	0.03	0.83	0.96	Phi1	0.93	0.044	0.78	0.98
p1	0.20	0.08	0.09	0.96	p1	0.20	0.06	0.11	0.34
					p2	0.10	0.07	0.02	0.33
					p3	0.09	0.09	0.01	0.43
					p4	0.09	0.12	0.00	0.60
Pent 1	0.03	0.03	0	0.24	Pent1	0.77	0.06	0.64	0.86
Pent2	0.24	0.08	0.12	0.43					
Pent3	0.20	0.08	0.08	0.40					
Pent4	0.17	0.08	0.07	0.39					
Pent5	0.27	0.09	0.14	0.48					
N	287.30	69.40	192.38	477.70	N	236.07	51.47	167.39	380.34

3- 2019 Aggregation 1									
a) Females					b) Males				
95% Confidence Interval					95% Confidence Interval				
Parameter	Estimate	SE	Lower	Upper	Parameter	Estimate	SE	Lower	Upper
Phi1	0.94	0.00	0.92	0.96	Phi1	0.36	0.066	0.25	0.50
p1	0.22	0.03	0.16	0.28	p1	0.72	0.14	0.40	0.91
Pent1	0.24	0.07	0.13	0.39	Pent1	0.53	0.08	0.37	0.68
Pent2	0.17	0.07	0.08	0.35	Pent2	0.01	0.05	0	0.98
Pent3	0.13	0.07	0.05	0.33					
Pent4	0.08	0.07	0.01	0.35					
Pent5	0.10	0.06	0.03	0.30					
Pent6	0.04	0.06	0.00	0.43					
Pent7	0.05	0.05	0.00	0.29					
Pent8	0.05	0.04	0.01	0.24					
N	379.81	36.85	319.68	466.02	N	69.32	9.96	59.61	105.16

4- 2018 Aggregation 2									
a) Females					b) Males				
95% Confidence Interval					95% Confidence Interval				
Parameter	Estimate	SE	Lower	Upper	Parameter	Estimate	SE	Lower	Upper
Phi1	0.95	0.01	0.92	0.97	Phi1	0.92	0.03	0.84	0.96
p1	0.27	0.05	0.18	0.39	p1	0.21	0.08	0.00	0.39
					p2	0.25	0.11	0.09	0.52
					p3	0.42	0.19	0.13	0.77
					p4	0.49	0.28	0.10	0.90
Pent1	0.24	0.09	0.10	0.46	Pent1	0.67	0.10	0.46	0.83
Pent2	0.38	0.10	0.20	0.59					
Pent3	0.20	0.10	0.07	0.47					
Pent4	0.13	0.10	0.02	0.46					
N	125.22	16.03	101.86	166.83	N	51.63	11.44	38.47	87.94

5- 2019 Aggregation 2									
a) Females					b) Males				
95% Confidence Interval					95% Confidence Interval				
Parameter	Estimate	SE	Lower	Upper	Parameter	Estimate	SE	Lower	Upper
Phi1	0.93	0.01	0.90	0.95	Phi1	0.82	0.04	0.72	0.89
p1	0.25	0.05	0.16	0.37	p1	0.79	0.25	0.16	0.99
Pent1	0.43	0.11	0.23	0.65	Pent1	0.13	0.09	0.03	0.41
Pent2	0.06	0.11	0.00	0.68	Pent2	0.03	0.04	0.00	0.35
Pent3	0.10	0.09	0.02	0.43	Pent3	0.15	0.07	0.06	0.35
Pent4	0.07	0.07	0.01	0.40					
Pent5	0.10	0.08	0.02	0.38					
Pent6	0.10	0.07	0.02	0.34					
Pent7	0.03	0.04	0.00	0.36					
N	149.18	22.12	116.73	206.26	N	30.69	8.06	26.47	72.66