Supplementary Information

Table S1: Modeled averaged estimates of encounter rates (p) and standard error (se) derived from CJS models. Cohort represents the first time an individual was captured, age represents the time since marking, and time represents the chronological recapture events each year.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| p | se | sex | cohort | age | time | sex | year |
| 0.03 | 0.02 | F | 1 | 1 | 2 | F | 2004 |
| 0.84 | 0.06 | F | 1 | 2 | 3 | F | 2005 |
| 0.35 | 0.07 | F | 1 | 3 | 4 | F | 2006 |
| 0.61 | 0.09 | F | 1 | 4 | 5 | F | 2007 |
| 0.50 | 0.09 | F | 1 | 5 | 6 | F | 2008 |
| 0.76 | 0.11 | F | 1 | 6 | 7 | F | 2009 |
| 0.84 | 0.06 | F | 2 | 1 | 3 | F | 2005 |
| 0.35 | 0.07 | F | 2 | 2 | 4 | F | 2006 |
| 0.61 | 0.09 | F | 2 | 3 | 5 | F | 2007 |
| 0.50 | 0.09 | F | 2 | 4 | 6 | F | 2008 |
| 0.76 | 0.11 | F | 2 | 5 | 7 | F | 2009 |
| 0.35 | 0.07 | F | 3 | 1 | 4 | F | 2006 |
| 0.61 | 0.09 | F | 3 | 2 | 5 | F | 2007 |
| 0.50 | 0.09 | F | 3 | 3 | 6 | F | 2008 |
| 0.76 | 0.11 | F | 3 | 4 | 7 | F | 2009 |
| 0.61 | 0.09 | F | 4 | 1 | 5 | F | 2007 |
| 0.50 | 0.09 | F | 4 | 2 | 6 | F | 2008 |
| 0.76 | 0.11 | F | 4 | 3 | 7 | F | 2009 |
| 0.50 | 0.09 | F | 5 | 1 | 6 | F | 2008 |
| 0.76 | 0.11 | F | 5 | 2 | 7 | F | 2009 |
| 0.76 | 0.11 | F | 6 | 1 | 7 | F | 2009 |
| 0.02 | 0.01 | M | 1 | 1 | 2 | M | 2004 |
| 0.78 | 0.08 | M | 1 | 2 | 3 | M | 2005 |
| 0.27 | 0.06 | M | 1 | 3 | 4 | M | 2006 |
| 0.51 | 0.08 | M | 1 | 4 | 5 | M | 2007 |
| 0.40 | 0.08 | M | 1 | 5 | 6 | M | 2008 |
| 0.69 | 0.13 | M | 1 | 6 | 7 | M | 2009 |
| 0.78 | 0.08 | M | 2 | 1 | 3 | M | 2005 |
| 0.27 | 0.06 | M | 2 | 2 | 4 | M | 2006 |
| 0.51 | 0.08 | M | 2 | 3 | 5 | M | 2007 |
| 0.40 | 0.08 | M | 2 | 4 | 6 | M | 2008 |
| 0.69 | 0.13 | M | 2 | 5 | 7 | M | 2009 |
| 0.27 | 0.06 | M | 3 | 1 | 4 | M | 2006 |
| 0.51 | 0.08 | M | 3 | 2 | 5 | M | 2007 |
| 0.40 | 0.08 | M | 3 | 3 | 6 | M | 2008 |
| 0.69 | 0.13 | M | 3 | 4 | 7 | M | 2009 |
| 0.51 | 0.08 | M | 4 | 1 | 5 | M | 2007 |
| 0.40 | 0.08 | M | 4 | 2 | 6 | M | 2008 |
| 0.69 | 0.13 | M | 4 | 3 | 7 | M | 2009 |
| 0.40 | 0.08 | M | 5 | 1 | 6 | M | 2008 |
| 0.69 | 0.13 | M | 5 | 2 | 7 | M | 2009 |
| 0.69 | 0.13 | M | 6 | 1 | 7 | M | 2009 |

Table S2. Modeled averaged estimates of survival from CJS models including males and females. Cohort represents the first time an individual was captured, age represents the time since marking, time represents the chronological recapture events each year, resident represents the modified age structure in which first captures were separated from following captures, and pdsi is the Palmer Drought Severity Index.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| survival | se | cohort | age | time | sex | resident | pdsi | year |
| 0.54 | 0.05 | 1 | 0 | 1 | F | 0 | -2.36 | 2003 |
| 0.66 | 0.04 | 1 | 1 | 2 | F | 1 | -0.18 | 2004 |
| 0.66 | 0.04 | 1 | 2 | 3 | F | 1 | -0.04 | 2005 |
| 0.65 | 0.05 | 1 | 3 | 4 | F | 1 | 2.31 | 2006 |
| 0.67 | 0.04 | 1 | 4 | 5 | F | 1 | -1.97 | 2007 |
| 0.67 | 0.04 | 1 | 5 | 6 | F | 1 | -0.76 | 2008 |
| 0.52 | 0.05 | 2 | 0 | 2 | F | 0 | -0.18 | 2004 |
| 0.66 | 0.04 | 2 | 1 | 3 | F | 1 | -0.04 | 2005 |
| 0.65 | 0.05 | 2 | 2 | 4 | F | 1 | 2.31 | 2006 |
| 0.67 | 0.04 | 2 | 3 | 5 | F | 1 | -1.97 | 2007 |
| 0.67 | 0.04 | 2 | 4 | 6 | F | 1 | -0.76 | 2008 |
| 0.52 | 0.05 | 3 | 0 | 3 | F | 0 | -0.04 | 2005 |
| 0.65 | 0.05 | 3 | 1 | 4 | F | 1 | 2.31 | 2006 |
| 0.67 | 0.04 | 3 | 2 | 5 | F | 1 | -1.97 | 2007 |
| 0.67 | 0.04 | 3 | 3 | 6 | F | 1 | -0.76 | 2008 |
| 0.51 | 0.06 | 4 | 0 | 4 | F | 0 | 2.31 | 2006 |
| 0.67 | 0.04 | 4 | 1 | 5 | F | 1 | -1.97 | 2007 |
| 0.67 | 0.04 | 4 | 2 | 6 | F | 1 | -0.76 | 2008 |
| 0.53 | 0.05 | 5 | 0 | 5 | F | 0 | -1.97 | 2007 |
| 0.67 | 0.04 | 5 | 1 | 6 | F | 1 | -0.76 | 2008 |
| 0.53 | 0.04 | 6 | 0 | 6 | F | 0 | -0.76 | 2008 |
| 0.54 | 0.05 | 1 | 0 | 1 | M | 0 | -2.36 | 2003 |
| 0.66 | 0.04 | 1 | 1 | 2 | M | 1 | -0.18 | 2004 |
| 0.66 | 0.04 | 1 | 2 | 3 | M | 1 | -0.04 | 2005 |
| 0.65 | 0.05 | 1 | 3 | 4 | M | 1 | 2.31 | 2006 |
| 0.67 | 0.04 | 1 | 4 | 5 | M | 1 | -1.97 | 2007 |
| 0.67 | 0.04 | 1 | 5 | 6 | M | 1 | -0.76 | 2008 |
| 0.52 | 0.05 | 2 | 0 | 2 | M | 0 | -0.18 | 2004 |
| 0.66 | 0.04 | 2 | 1 | 3 | M | 1 | -0.04 | 2005 |
| 0.65 | 0.05 | 2 | 2 | 4 | M | 1 | 2.31 | 2006 |
| 0.67 | 0.04 | 2 | 3 | 5 | M | 1 | -1.97 | 2007 |
| 0.67 | 0.04 | 2 | 4 | 6 | M | 1 | -0.76 | 2008 |
| 0.52 | 0.05 | 3 | 0 | 3 | M | 0 | -0.04 | 2005 |
| 0.65 | 0.05 | 3 | 1 | 4 | M | 1 | 2.31 | 2006 |
| 0.67 | 0.04 | 3 | 2 | 5 | M | 1 | -1.97 | 2007 |
| 0.67 | 0.04 | 3 | 3 | 6 | M | 1 | -0.76 | 2008 |
| 0.51 | 0.06 | 4 | 0 | 4 | M | 0 | 2.31 | 2006 |
| 0.67 | 0.04 | 4 | 1 | 5 | M | 1 | -1.97 | 2007 |
| 0.67 | 0.04 | 4 | 2 | 6 | M | 1 | -0.76 | 2008 |
| 0.53 | 0.05 | 5 | 0 | 5 | M | 0 | -1.97 | 2007 |
| 0.67 | 0.04 | 5 | 1 | 6 | M | 1 | -0.76 | 2008 |
| 0.53 | 0.04 | 6 | 0 | 6 | M | 0 | -0.76 | 2008 |

Table S3: Modeled averaged estimates of encounter rates (p) and standard error (se) derived from multistate models of immature (N) and mature (R) females. Cohort represents the first time an individual was captured, age represents the time since marking, and time represents the chronological recapture events each year.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| p | se | group | cohort | age | time | maturity | year |
| 0.00 | 0.00 | 1 | 1 | 1 | 2 | N | 2004 |
| 0.61 | 0.16 | 1 | 1 | 2 | 3 | N | 2005 |
| 0.15 | 0.08 | 1 | 1 | 3 | 4 | N | 2006 |
| 0.29 | 0.15 | 1 | 1 | 4 | 5 | N | 2007 |
| 0.19 | 0.11 | 1 | 1 | 5 | 6 | N | 2008 |
| 0.26 | 0.16 | 1 | 1 | 6 | 7 | N | 2009 |
| 0.61 | 0.16 | 1 | 2 | 1 | 3 | N | 2005 |
| 0.15 | 0.08 | 1 | 2 | 2 | 4 | N | 2006 |
| 0.29 | 0.15 | 1 | 2 | 3 | 5 | N | 2007 |
| 0.19 | 0.11 | 1 | 2 | 4 | 6 | N | 2008 |
| 0.26 | 0.16 | 1 | 2 | 5 | 7 | N | 2009 |
| 0.15 | 0.08 | 1 | 3 | 1 | 4 | N | 2006 |
| 0.29 | 0.15 | 1 | 3 | 2 | 5 | N | 2007 |
| 0.19 | 0.11 | 1 | 3 | 3 | 6 | N | 2008 |
| 0.26 | 0.16 | 1 | 3 | 4 | 7 | N | 2009 |
| 0.29 | 0.15 | 1 | 4 | 1 | 5 | N | 2007 |
| 0.19 | 0.11 | 1 | 4 | 2 | 6 | N | 2008 |
| 0.26 | 0.16 | 1 | 4 | 3 | 7 | N | 2009 |
| 0.19 | 0.11 | 1 | 5 | 1 | 6 | N | 2008 |
| 0.26 | 0.16 | 1 | 5 | 2 | 7 | N | 2009 |
| 0.26 | 0.16 | 1 | 6 | 1 | 7 | N | 2009 |
| 0.00 | 0.00 | 1 | 1 | 1 | 2 | R | 2004 |
| 0.88 | 0.07 | 1 | 1 | 2 | 3 | R | 2005 |
| 0.44 | 0.09 | 1 | 1 | 3 | 4 | R | 2006 |
| 0.65 | 0.11 | 1 | 1 | 4 | 5 | R | 2007 |
| 0.51 | 0.10 | 1 | 1 | 5 | 6 | R | 2008 |
| 0.62 | 0.14 | 1 | 1 | 6 | 7 | R | 2009 |
| 0.88 | 0.07 | 1 | 2 | 1 | 3 | R | 2005 |
| 0.44 | 0.09 | 1 | 2 | 2 | 4 | R | 2006 |
| 0.65 | 0.11 | 1 | 2 | 3 | 5 | R | 2007 |
| 0.51 | 0.10 | 1 | 2 | 4 | 6 | R | 2008 |
| 0.62 | 0.14 | 1 | 2 | 5 | 7 | R | 2009 |
| 0.44 | 0.09 | 1 | 3 | 1 | 4 | R | 2006 |
| 0.65 | 0.11 | 1 | 3 | 2 | 5 | R | 2007 |
| 0.51 | 0.10 | 1 | 3 | 3 | 6 | R | 2008 |
| 0.62 | 0.14 | 1 | 3 | 4 | 7 | R | 2009 |
| 0.65 | 0.11 | 1 | 4 | 1 | 5 | R | 2007 |
| 0.51 | 0.10 | 1 | 4 | 2 | 6 | R | 2008 |
| 0.62 | 0.14 | 1 | 4 | 3 | 7 | R | 2009 |
| 0.51 | 0.10 | 1 | 5 | 1 | 6 | R | 2008 |
| 0.62 | 0.14 | 1 | 5 | 2 | 7 | R | 2009 |
| 0.62 | 0.14 | 1 | 6 | 1 | 7 | R | 2009 |

Table S4. Modeled averaged estimates of survival derived from multistate models of immature (N) and mature (R) females. Cohort represents the first time an individual was captured, age represents the time since marking, time represents the chronological recapture events each year, resident represents the modified age structure in which first captures were separated from following captures, and pdsi is the Palmer Drought Severity Index.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| survival | se | cohort | age | time | maturity | resident | pdsi | year |
| 0.65 | 0.08 | 1 | 0 | 1 | N | 0 | -2.355 | 2003 |
| 0.64 | 0.05 | 1 | 1 | 2 | N | 1 | -0.175 | 2004 |
| 0.64 | 0.05 | 1 | 2 | 3 | N | 1 | -0.035 | 2005 |
| 0.56 | 0.08 | 1 | 3 | 4 | N | 1 | 2.305 | 2006 |
| 0.70 | 0.07 | 1 | 4 | 5 | N | 1 | -1.965 | 2007 |
| 0.66 | 0.05 | 1 | 5 | 6 | N | 1 | -0.755 | 2008 |
| 0.58 | 0.07 | 2 | 0 | 2 | N | 0 | -0.175 | 2004 |
| 0.64 | 0.05 | 2 | 1 | 3 | N | 1 | -0.035 | 2005 |
| 0.56 | 0.08 | 2 | 2 | 4 | N | 1 | 2.305 | 2006 |
| 0.70 | 0.07 | 2 | 3 | 5 | N | 1 | -1.965 | 2007 |
| 0.66 | 0.05 | 2 | 4 | 6 | N | 1 | -0.755 | 2008 |
| 0.58 | 0.07 | 3 | 0 | 3 | N | 0 | -0.035 | 2005 |
| 0.56 | 0.08 | 3 | 1 | 4 | N | 1 | 2.305 | 2006 |
| 0.70 | 0.07 | 3 | 2 | 5 | N | 1 | -1.965 | 2007 |
| 0.66 | 0.05 | 3 | 3 | 6 | N | 1 | -0.755 | 2008 |
| 0.49 | 0.11 | 4 | 0 | 4 | N | 0 | 2.305 | 2006 |
| 0.70 | 0.07 | 4 | 1 | 5 | N | 1 | -1.965 | 2007 |
| 0.66 | 0.05 | 4 | 2 | 6 | N | 1 | -0.755 | 2008 |
| 0.64 | 0.07 | 5 | 0 | 5 | N | 0 | -1.965 | 2007 |
| 0.66 | 0.05 | 5 | 1 | 6 | N | 1 | -0.755 | 2008 |
| 0.60 | 0.06 | 6 | 0 | 6 | N | 0 | -0.755 | 2008 |
| 0.65 | 0.08 | 1 | 0 | 1 | R | 0 | -2.355 | 2003 |
| 0.64 | 0.05 | 1 | 1 | 2 | R | 1 | -0.175 | 2004 |
| 0.64 | 0.05 | 1 | 2 | 3 | R | 1 | -0.035 | 2005 |
| 0.56 | 0.08 | 1 | 3 | 4 | R | 1 | 2.305 | 2006 |
| 0.70 | 0.07 | 1 | 4 | 5 | R | 1 | -1.965 | 2007 |
| 0.66 | 0.05 | 1 | 5 | 6 | R | 1 | -0.755 | 2008 |
| 0.58 | 0.07 | 2 | 0 | 2 | R | 0 | -0.175 | 2004 |
| 0.64 | 0.05 | 2 | 1 | 3 | R | 1 | -0.035 | 2005 |
| 0.56 | 0.08 | 2 | 2 | 4 | R | 1 | 2.305 | 2006 |
| 0.70 | 0.07 | 2 | 3 | 5 | R | 1 | -1.965 | 2007 |
| 0.66 | 0.05 | 2 | 4 | 6 | R | 1 | -0.755 | 2008 |
| 0.58 | 0.07 | 3 | 0 | 3 | R | 0 | -0.035 | 2005 |
| 0.56 | 0.08 | 3 | 1 | 4 | R | 1 | 2.305 | 2006 |
| 0.70 | 0.07 | 3 | 2 | 5 | R | 1 | -1.965 | 2007 |
| 0.66 | 0.05 | 3 | 3 | 6 | R | 1 | -0.755 | 2008 |
| 0.49 | 0.11 | 4 | 0 | 4 | R | 0 | 2.305 | 2006 |
| 0.70 | 0.07 | 4 | 1 | 5 | R | 1 | -1.965 | 2007 |
| 0.66 | 0.05 | 4 | 2 | 6 | R | 1 | -0.755 | 2008 |
| 0.64 | 0.07 | 5 | 0 | 5 | R | 0 | -1.965 | 2007 |
| 0.66 | 0.05 | 5 | 1 | 6 | R | 1 | -0.755 | 2008 |
| 0.60 | 0.06 | 6 | 0 | 6 | R | 0 | -0.755 | 2008 |

Table S5. Modeled averaged estimates of transition probabilities (psi) of transitioning from an immature (N) to a mature (R) female derived from multistate models. Cohort represents the first time an individual was captured, age represents the time since marking, time represents the chronological recapture events each year, resident represents the modified age structure in which first captures were separated from following captures, and pdsi is the Palmer Drought Severity Index.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| psi | se | cohort | age | time | trans | pdsi | year |
| 0.237103 | 0.128039 | 1 | 0 | 1 | 0 | -2.355 | 2003 |
| 0.731516 | 0.114148 | 1 | 1 | 2 | 1 | -0.175 | 2004 |
| 0.732897 | 0.11365 | 1 | 2 | 3 | 1 | -0.035 | 2005 |
| 0.753567 | 0.128311 | 1 | 3 | 4 | 1 | 2.305 | 2006 |
| 0.712576 | 0.142876 | 1 | 4 | 5 | 1 | -1.965 | 2007 |
| 0.725635 | 0.118853 | 1 | 5 | 6 | 1 | -0.755 | 2008 |
| 0.255178 | 0.111179 | 2 | 0 | 2 | 0 | -0.175 | 2004 |
| 0.732897 | 0.11365 | 2 | 1 | 3 | 1 | -0.035 | 2005 |
| 0.753567 | 0.128311 | 2 | 2 | 4 | 1 | 2.305 | 2006 |
| 0.712576 | 0.142876 | 2 | 3 | 5 | 1 | -1.965 | 2007 |
| 0.725635 | 0.118853 | 2 | 4 | 6 | 1 | -0.755 | 2008 |
| 0.256475 | 0.11107 | 3 | 0 | 3 | 0 | -0.035 | 2005 |
| 0.753567 | 0.128311 | 3 | 1 | 4 | 1 | 2.305 | 2006 |
| 0.712576 | 0.142876 | 3 | 2 | 5 | 1 | -1.965 | 2007 |
| 0.725635 | 0.118853 | 3 | 3 | 6 | 1 | -0.755 | 2008 |
| 0.28044 | 0.144706 | 4 | 0 | 4 | 0 | 2.305 | 2006 |
| 0.712576 | 0.142876 | 4 | 1 | 5 | 1 | -1.965 | 2007 |
| 0.725635 | 0.118853 | 4 | 2 | 6 | 1 | -0.755 | 2008 |
| 0.240042 | 0.123987 | 5 | 0 | 5 | 0 | -1.965 | 2007 |
| 0.725635 | 0.118853 | 5 | 1 | 6 | 1 | -0.755 | 2008 |
| 0.249978 | 0.113455 | 6 | 0 | 6 | 0 | -0.755 | 2008 |