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## Appendix 1

Table A1. Model comparison results of the best base structure for joint live-dead models estimating weekly survival of a northern bobwhite *Colinus virginianus* population at the Di-Lane Wildlife Management Area in Burke County, Georgia. Factors tested included the sex (0 = female; 1 = male), season (summer or winter), and hunting period (hunt; 0 = no hunting week; 1 = hunting week) coded as dummy variables. All models included the same structures for live reencounter  $\{p(\text{year-month})\}$ , dead encounter  $\{r(\text{year-month})\}$  and fidelity  $\{F(1)\}$ . The number of parameters (K),  $\Delta\text{AICc}$  (difference between AICc of 17818.4 for top-ranked model and current model), model weight ( $\omega$ ), and deviance are provided.

Model	K	$\Delta\text{AICc}$	weight ( $\omega$ )	Deviance
season + hunt	65	0.0	0.642	14646.1
season + hunt + sex	66	1.2	0.358	14645.2
season	64	24.2	0.000	14672.2
sex + season	65	25.2	0.000	14671.3
hunt	64	29.1	0.000	14677.2
hunt + sex	65	30.6	0.000	14676.6
null	63	38.1	0.000	14688.2
sex	64	39.4	0.000	14687.5

Table A2. Estimated encounter and fidelity probabilities from a capture-recapture model fit to a northern bobwhite *Colinus virginianus* population at the Di-Lane Wildlife Management Area in Burke County, Georgia. Parameter estimates are from a top-ranked joint live-dead survival model  $\{S(\text{season}+\text{hunt})p(\text{year-month})r(\text{year-month})F(1)\}$  fit to radio-marked birds and selected using AICc. Parameters are live reencounter probability ( $p$ ), dead recovery probability ( $r$ ), and fidelity probability ( $F$  – fixed at 1). Estimates are produced for each year-month (year-month) from October 2016 to April 2019. Estimates are on the weekly scale, but weekly estimates are constrained to be the same within each year-month.

Parameter	year-month	Estimate	SE	LCI	UCL
$p$	2016-10	0.329	0.030	0.272	0.390
$p$	2016-11	0.471	0.020	0.432	0.511
$p$	2016-12	0.654	0.019	0.617	0.690
$p$	2017-01	0.732	0.022	0.688	0.773
$p$	2017-02	0.747	0.022	0.702	0.787
$p$	2017-03	0.845	0.015	0.814	0.873
$p$	2017-04	0.788	0.020	0.746	0.825
$p$	2017-05	0.775	0.022	0.729	0.815
$p$	2017-06	0.809	0.020	0.767	0.845
$p$	2017-07	0.744	0.029	0.683	0.797
$p$	2017-08	0.702	0.033	0.634	0.761
$p$	2017-09	0.492	0.039	0.416	0.568
$p$	2017-10	0.598	0.036	0.527	0.666
$p$	2017-11	0.811	0.017	0.775	0.842
$p$	2017-12	0.713	0.018	0.676	0.748
$p$	2018-01	0.787	0.021	0.743	0.826
$p$	2018-02	0.780	0.022	0.733	0.820
$p$	2018-03	0.880	0.013	0.852	0.903
$p$	2018-04	0.872	0.015	0.840	0.899
$p$	2018-05	0.851	0.017	0.814	0.881
$p$	2018-06	0.767	0.020	0.725	0.804
$p$	2018-07	0.703	0.029	0.643	0.756
$p$	2018-08	0.606	0.037	0.532	0.676
$p$	2018-09	0.498	0.039	0.423	0.573
$p$	2018-10	0.681	0.034	0.611	0.744
$p$	2018-11	0.798	0.020	0.755	0.834
$p$	2018-12	0.757	0.017	0.721	0.789
$p$	2019-01	0.741	0.022	0.695	0.782
$p$	2019-02	0.570	0.028	0.515	0.624
$p$	2019-03	0.886	0.016	0.852	0.913
$p$	2019-04	0.955	0.012	0.924	0.974
$r$	2016-10	0.883	0.118	0.448	0.986
$r$	2016-11	1.000	0.000	0.000	1.000
$r$	2016-12	0.973	0.031	0.780	0.997
$r$	2017-01	1.000	0.000	0.000	1.000
$r$	2017-02	0.790	0.142	0.413	0.953
$r$	2017-03	0.533	0.112	0.322	0.733
$r$	2017-04	0.706	0.138	0.395	0.898

Parameter	year-month	Estimate	SE	LCI	UCL
<i>r</i>	2017-05	0.642	0.142	0.347	0.858
<i>r</i>	2017-06	0.806	0.094	0.560	0.931
<i>r</i>	2017-07	0.187	0.121	0.046	0.523
<i>r</i>	2017-08	0.635	0.175	0.284	0.884
<i>r</i>	2017-09	0.541	0.128	0.300	0.763
<i>r</i>	2017-10	0.495	0.179	0.194	0.800
<i>r</i>	2017-11	0.937	0.068	0.607	0.993
<i>r</i>	2017-12	0.933	0.040	0.801	0.980
<i>r</i>	2018-01	0.934	0.071	0.596	0.993
<i>r</i>	2018-02	1.000	0.000	0.000	1.000
<i>r</i>	2018-03	0.780	0.142	0.412	0.947
<i>r</i>	2018-04	0.751	0.098	0.518	0.894
<i>r</i>	2018-05	0.941	0.072	0.558	0.995
<i>r</i>	2018-06	0.759	0.088	0.552	0.889
<i>r</i>	2018-07	0.781	0.095	0.545	0.914
<i>r</i>	2018-08	0.526	0.148	0.258	0.780
<i>r</i>	2018-09	0.653	0.187	0.272	0.905
<i>r</i>	2018-10	0.809	0.187	0.283	0.979
<i>r</i>	2018-11	0.420	0.144	0.185	0.699
<i>r</i>	2018-12	0.989	0.032	0.184	1.000
<i>r</i>	2019-01	0.743	0.119	0.461	0.908
<i>r</i>	2019-02	0.462	0.123	0.245	0.694
<i>r</i>	2019-03	0.632	0.087	0.453	0.781
<i>r</i>	2019-04	0.514	0.107	0.314	0.710
<i>F</i>	fixed	1.000	0.000	0.000	0.000

Table A3. Estimated encounter and fidelity probabilities from a capture-recapture model fit to a northern bobwhite *Colinus virginianus* population at the Di-Lane Wildlife Management Area in Burke County, Georgia. Parameter estimates are from a top-ranked joint live-dead survival model  $\{S(\text{capseason}+\text{mtype})p(\text{capseason}+\text{mtype})r(\text{time}+\text{mtype})F(1)\}$  fit to radio-marked and banded-only birds and selected using AICc. Parameters are live reencounter probability ( $p$ ), dead recovery probability ( $r$ ), and fidelity probability ( $F$  – fixed at 1). Estimates are produced for season (capseason), season-year (time), and group (band-only or radio-marked; mtype) from October 2016 to April 2019. Estimates are on the seasonal scale (Fall-Spring and Spring-Fall). Live reencounter probabilities differ by season but are constrained to be the same across years, but dead recovery probabilities vary by season and year.

Parameter	Period	Group	Estimate	SE	LCL	UCL
$p$	Fall	band-only	0.245	0.042	0.172	0.336
$p$	Spring	band-only	0.095	0.030	0.050	0.173
$p$	Fall	radio-marked	0.897	0.023	0.842	0.935
$p$	Spring	radio-marked	0.738	0.052	0.624	0.827
$r$	Fall 16	band-only	0.196	0.048	0.118	0.308
$r$	Fall 17	band-only	0.232	0.063	0.131	0.377
$r$	Fall 18	band-only	0.164	0.053	0.084	0.296
$r$	Fall 16	radio-marked	0.896	0.031	0.817	0.943
$r$	Spring 17	radio-marked	0.596	0.048	0.499	0.686
$r$	Fall 17	radio-marked	0.914	0.029	0.838	0.956
$r$	Spring 18	radio-marked	0.744	0.042	0.654	0.817
$r$	Fall 18	radio-marked	0.873	0.050	0.741	0.943
$r$	Spring 19	radio-marked	0.340	0.051	0.249	0.445
$F$	both	both	1.000	0.000	0.000	0.000