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Primeness in Early Season Arkansas Raccoon Pelts

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Running Title: Primeness in Early Season Arkansas Raccoon Pelts

Due to historical overharvesting, the trapping of furbearers is now a highly regulated activity with legal trapping being restricted to certain time periods that are congruent with when fur is in prime condition and most valuable (Hamilton and Cook 1946; Linscomb 1987). Although there are no objective criteria, a commonly accepted definition of prime is “the fur has reached its maximum length, density and finest texture; when the hairs have matured with seemingly no pigment being produced, and as a consequence, the flesh surface of the pelt appears devoid of hair root pigmentation.” (Linde 1963). Reduced hours of daylight during the fall appear to stimulate the start of the priming process (Worthy *et al.* 1987).

Research on when furbearer pelts are in prime condition is surprisingly sparse and as primeness is subjective, can be difficult to perform (Applegate and Predmore Jr 1947; Chabreck and Dupuie 1970; Kellog 1946; Kellog 1947; Linde 1963; Markley 1947). Stains (1979) characterized prime dates of many furbearing species to a great extent based on the opinion of one experienced fur dealer. The only analyses of priming in raccoon (*Procyon lotor*), one of the most commonly trapped furbearers in the United States, were done with pelts from Indiana and Michigan (Stuwer 1942) and Georgia (Hon 1981) and may not be applicable to Arkansas due to latitudinal differences in priming patterns caused by changes in day length.

The purpose of this study was to determine if the current start to the trapping season on the second Saturday in November is either too early or too late based on primeness patterns of Arkansas raccoons.

Raccoons were captured by staff from the Arkansas Game and Fish Commission and cooperating agencies using traditional trapping techniques from November 1-30 of 2014 and 2015. Raccoons were identified to sex and age, although one individual was not assigned an age but is included in later testing involving all raccoons. Two raccoons captured on October 31, 2015 were included in the study and analyzed with the November 1-15 and week 1 records. Raccoons were then skinned and the pelts stretched and dried. Pelts

were gathered together and following the conclusion of each season were taken to five experienced Arkansas fur dealers for grading. Pelts were graded as unprime, coming on to prime, or prime (Obbard 1987). When there was not complete agreement among fur dealers as to the grade for a pelt, it was assigned a grade based upon the majority view of the dealers. In order to account for differences in what each fur dealer considered prime, pelts were combined into prime and unprime categories for analysis under both liberal and conservative views of prime. Only pelts graded as prime were considered prime in the conservative system. Under the liberal system, pelts graded as prime and coming on to prime were combined together as prime since dealers indicated that they would generally purchase those pelts for prices similar to that they would give for prime pelts.

Differences in proportions of pelts that were prime were examined using Fishers exact test. Fishers exact test with the Bonferroni correction was used to compare weekly differences in percentages of prime pelts. Logistic regression was used to examine the probability of primeness based on Julian date.

A total of 122 raccoons (75 male:47 female) were captured with the majority (74%) being adults. Effort was not distributed evenly across the state; 58 (48%) of captures were from southern Arkansas (Bradley, Hempstead, Howard, Jefferson, Lafayette, Pike, Sevier counties), 37 (30%) were from central Arkansas (Faulkner, Pulaski, Saline, White counties) and 27 (22%) from northern (Benton, Boone, Cleburne, Craighead, Washington counties) Arkansas.

There were no significant differences in primeness between sexes over the entire month either in juveniles or adults. However, when the first half of November is compared to the last half of November, adults had a higher percentage of prime pelts later in the month under both grading systems and when graded conservatively, adult males and all raccoons were more likely to be prime later in the month. Adults were significantly more likely to be prime under both the conservative ($p=0.0009$) and liberal ($p=0.101$) grading systems (Table

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1). The only significant difference in primeness within regions was that adult raccoons in the south region were less likely to be prime in the first half of November than later that month ($p=0.0031$). There was a significant difference between regions ($p=0.0481$) however when pairwise comparisons were made none were significant, most likely due to small sample size.

Similarly, weekly analyses found significant differences in percentage of prime pelts among adult males, all adults, and all raccoons when graded conservatively and among all adults and all raccoons when graded liberally (Table 2). However, the only significant weekly pairwise comparisons were for all raccoons between weeks 1 and 4 when graded conservatively ($p=0.0064$) and between weeks 1 and 2 ($p=0.0041$) and weeks 1 and 4 ($p=0.001$) when graded liberally. We calculated a logistic regression between primeness and Julian date using all adults and this also indicated a higher probability of pelts being prime later in the month using both the conservative ($X^2=3.38$, $p<0.001$) and liberal ($X^2=3.01$, $p=0.003$) grading systems (Figure 1).

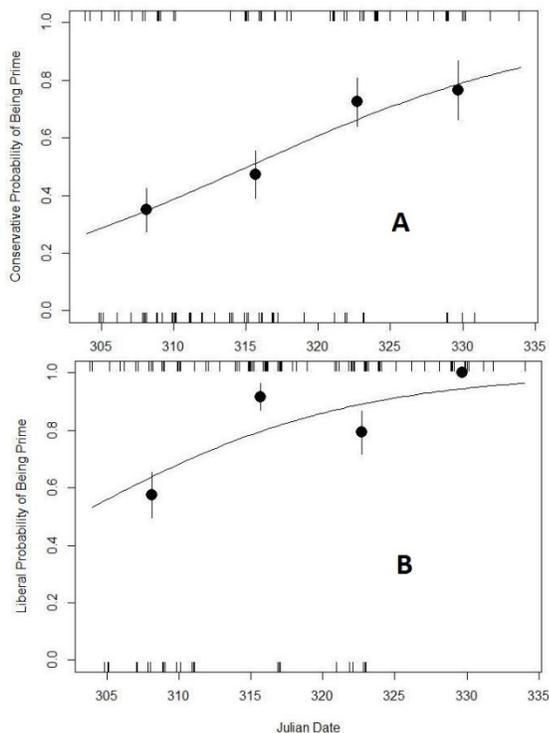


Figure 1. Probability of a raccoon pelt being in prime condition by Julian date under the conservative (A) and liberal (B) grading systems. Plotted values represent mean probability of being prime and error bars represent standard error of a binomial proportion. Lines correspond to the logistic regression of primeness by Julian Date.

Although there are no guidelines as to what percentage of furs must be prime to be acceptable, Hon (1981) suggested that at least 80% of furs should be prime to be considered a good fur market. This study found that under the conservative grading system this percentage of prime furs is not reached until the last half of November or approximately Julian Date 330 or later.

The dealers involved in grading the pelts used in this study indicated that they would generally buy pelts that were “coming on to prime” as if they were prime, which suggests that the liberal grading system may be more representative of the prices received by Arkansas trappers and thus drive trapping effort. When graded liberally the Julian Date by which 80% of furs were prime was approximately 10 days earlier (Julian date 320) than under the conservative grading system.

This study indicates that starting the trapping season in the last half of the month may maximize the percentage of pelts that are in prime condition early in the season, especially in the southern region of the state.

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Table 1. Arkansas raccoon pelt grades by half month, November 2014 and 2015. P value is based upon the Fishers exact test.

	Nov 1-15		Nov 16-30		p
	Prime	Unprime	Prime	Unprime	
Conservative Grade					
Juveniles	7	17	2	6	1
Adults (all)	24	27	32	6	0.0004
Males	15	17	23	4	0.0028
Females	9	10	9	2	0.1213
All raccoons	31	45	34	12	0.0004
Liberal Grade					
Juveniles	16	8	4	4	0.4325
Adults (all)	40	11	36	2	0.0366
Males	26	6	26	1	0.1120
Females	14	5	10	1	0.3717
All raccoons	56	20	40	6	0.1106

Table 2. Percentage of Arkansas raccoon pelt in prime condition by week, November 2014 and 2015. P value is based upon the Fishers exact test.

	Week 1		Week 2		Week 3		Week 4		p
	Prime	Unprime	Prime	Unprime	Prime	Unprime	Prime	Unprime	
Conservative Grade									
Juveniles	2	8	5	8	1	5	1	2	0.7910
Adults (all)	12	16	12	11	18	4	14	2	0.0034
Males	8	9	7	8	15	2	8	2	0.0214
Females	4	7	5	3	3	2	6	0	0.0816
All raccoons	14	25	17	19	19	9	15	4	0.0053
Liberal Grade									
Juveniles	4	6	11	2	2	4	3	0	0.0290
Adults (all)	19	9	21	2	20	2	16	0	0.0167
Males	12	5	14	1	16	1	10	0	0.0918
Females	7	4	7	1	4	1	6	0	0.3423
All raccoons	23	16	32	4	22	6	19	0	0.0006