Using Stable Isotope Analysis to Estimate Black Bear Diet in Vermont

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The black bear (*Ursus americanus*) is an iconic species with cultural, economic and ecological importance. Food is an important resource for bears and food-conditioning is a leading cause of human-bear conflict. A greater understanding of bear diet will help wildlife professionals identify the relative importance of food items. It may also lead to insight into human food consumption and guide management decisions aimed at reducing human-bear conflict. Stable isotopes can be used to analyze and describe proportional contribution of food items to diet. Carbon and nitrogen isotopes are assimilated by animals through diet. In consumer tissue, carbon isotope signatures reflect differences in $\delta^{13}C$ values among primary producers while nitrogen isotope signatures ($\delta^{15}N$) may indicate trophic level position. Black bear hair samples (n=71) were obtained from a pre-existing collection, representing 13 Vermont counties (excluding Grand Isle). For each county, white-tailed deer (*Odocoileus virginiana*) hair samples (n=38) were collected during the 2013 fall hunting season, natural plant food samples (n~620) were collected in the summer of 2013. Human hair samples (n=20) were collected from salons in Chittenden County to represent garbage as a potential food source. I used stable isotope analysis to estimate $\delta^{13}C$ and $\delta^{15}N$ from Vermont bear hair samples and compared them to isotopic estimates of 9 plant species thought to be important to Vermont bears, local and non-local corn, birdseed, human hair, and white-tailed deer hair. I will use a mixing model approach to examine proportional contribution of food items to bear diet, including the relative contribution of human foods. I will also develop a set of models to examine hypotheses related to the influence of sex, location, hard mast production, and nuisance status on diet.