

Practice Problems Set #1

FLBearhunt.txt reports data from the 2015 black bear hunt in Florida (thanks to D'Axel Vargas for sharing this!). This hunt was controversial, as it was the first such licensed hunting event in Florida in 21 years. Nearly 3,000 hunters obtained special permits, and ~10% of Florida's bear population was culled.

Good info is at: <http://news.nationalgeographic.com/2015/10/151023-black-bear-hunt-florida-animals-conservation/>

Here we address some basic questions about the hunt. And if we consider this a sample of Florida bears, perhaps we can gain some insight into their population biology.

1. Was bear harvest evenly balanced among counties reporting harvested bears? If not, which counties "harvested" more bears than average?
2. Which tend to weigh more: males or females, after accounting for the random effect of WeightInfo? What is the average weight difference, and is that difference statistically significant?
3. Some may argue that the hunt is valuable to the bear population because it culls older, less healthy bears from the population. Florida black bears are considered sexually mature at age 3-4 (<http://myfwc.com/wildlifehabitats/managed/bear/facts/hibernation/>). Indicators of health may include Condition (where 1 = excellent, 2 = good, 3 = fair, 4 = poor, 5 = unknown) and measures of size (e.g., weight, chest girth). Is this argument supported by evidence? If not, what would you conclude?
4. Do counties differ significantly in the size of bears (assuming hunting provides a representative sample)? If so, which county or counties have the biggest bears, and which have the smallest? Finally, evaluate the question of "representative" sample for those big-bear and small-bear counties; were samples adequate?
5. Female bears were likely in various reproductive stages. Can a predictive model be obtained from these data to predict lactating status, and thus help confidently set rules to avoid hunting lactating females (because... cubs)? If so, what is that model, and which variable(s) are most important?