Module 20 homework

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8/20/17

Bear habitat use

1. A=0.10
2. Ho: “distribution of habitat use by bears is the same as the proportions of available habitat” vs Ha: “distribution of habitat use by bears is NOT THE SAME as the proportions of available habitat”
3. A goodness of fit test is required because (i) a categorical variable was recorded (habitat use) (ii) a single population was sampled (bears in area) and (iii) the observed distribution is compared to the theoretical distribution.
4. The data appears to be a part of an observational study with randomly selected viewing times.
5. There are more than five individuals expected in each habitat (table 1).
6. The statistic is the observed frequency table (table 1).
7. X2=7.7478 with four degrees of freedom (table 2).
8. P-value=0.1013(Table 2)
9. DNR reject Ho.
10. The bears appear to use habitats in the same proportions as the availability of the habitat.

Table 1-Observed and expected frequencies for the Goodness-of-Fit Test for bear habitat use

obs exp

Lowcov 47 34

Aspen 12 17

Open 10 12

Upland 21 25

Mixed 10 12

Table 2-Chi-squared test for given probabilities with obs

X-squared = 7.7478, df = 4, p-value = 0.1013

Ginseng Consumption by Deer

1. A=0.05
2. Ho: The percentage of ginseng plants consumed by white tailed deer is 33% vs Ha: the percentage of ginseng plants consumed by white tailed deer is NOT 33%.
3. A goodness of fit test is required because (i) a single categorical variable was recorded (ginseng selected by deer to be eaten), (ii) a single population was recorded (p5) and (iii) the observed distribution is compared to a theoretical distribution.
4. The data appears to be an observational study with random ginseng plants being selected.
5. The expected number in the “eaten” category is 16.79(73x0.23) and the expected number in the “not eaten” category is 48.91(73x0.67).(Table 1)
6. The appropriate statistic is the observed frequency table in Table 1
7. X2=9.209382 with 1 DF. X2=(16.79-33)2/(34)+(18.4-26)2/(39) with 1-2.
8. P-value=0.002497
9. Ho is rejected because the p-value <a(0.002497<0.10)
10. The percentage of ginseng consumed by deer does appear to be different then the percentage (33%) reported.
11. I am 90% confident that the percentage of ginseng consumed by deer is between 33.78% and 56.62%.(33/73+--1.960\*sqrt(0.452(1-0.452)/73=0.452+--1.960\*0.058=0.452+--0.114=(0.338,0.566)

Table 1. Observed and expected frequencies for the Goodness-of-Fit Test for Ginseng consumed by deer.

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| --- |
| Expected Observed  Eaten 16.79 33  Not Eaten 48.9 40 |
|  |
| |  | | --- | |  | |

Road Rage

1. Cannot continue with Goodness of fit test because not all assumptions are met (expected value in each cell is >5) Monday only has 4.

R Stuff

#Bear

library(NCStats)

( obs <- c(Lowcov=47,Aspen=12,Open=10,Upland=21,Mixed=10))

( p.exp<- c(Lowcov=0.34,Aspen=0.17,Open=0.12,Upland=0.25,Mixed=0.12))

( bear.chi <-chisq.test(obs,p=p.exp,rescale.p = TRUE,correct=FALSE))

data.frame(obs=bear.chi$observed,exp=bear.chi$expected)

gofCI(bear.chi,digits=3)

#deer

distrib(9.210,distrib="chisq",df=1,lower.tail = FALSE)