Data Set 1 (from the Government Study)

- $p = 0.6$
- $h = 0.45$
- $N_p - 100$

Data Set 2 (from university biologists):

- $p = 0.4$
- $h - 0.38$
- $N_p = 25$

Data Set 3 (from the Sierra Club Study)

- $p = 0.2$
- $h - 0.35$
- $N_p = 10$

1. What strikes you as strange or inconsistent among the three estimates of p and h within the Species X ecosystem?

   The government study has much higher numbers for both habitable area and population. The other two studies have numbers more aligned for habitable area.

a. The government study had ten times more samples than the Sierra Club study and four times more than the University study. In their sampling the Sierra club could have cherry picked specific locations. And the University scientists probably went to the most accessible locations.

What strikes me as inconsistent among the three estimates of p and h is that the study that the government did shows an overestimation in comparison to the other two studies. In the government's studies, there is conveniently no need for an increase in suitable territories which makes me think that the government is trying to promote the narrative that nothing needs to be done and that everything is fine as it is. The studies that were not conducted by the government reflect a need for change in the amount of suitable territories.

0.6 + 0.45 = ???

2. Derive K k = (ph)- (h) + 1

Government study
k= (0.6)(0.45)-0.45+1
k=0.82

University study
k=0.4*0.38-0.38+1
k=0.772

Sierra Club Study
k=0.2*0.35-0.35+1
k=0.72

Note that all three studies given similar values for K

2. po−1- (1-k)/h

Government	University	Sierra Club
0.6=1-(1-k)/0.45	0.4=1-(1-k)/0.38	0.2=1-(1-k)/0.35
k–.82	k– 0.77	k– 0.72

3. Uncertainty in K

Government

σ_p^2 =p(1-p)/NsubP =0.6*(1-0.6)/100=0.0024

σ_k^2 = $(h)^2$*(var P) =0.45*0.45*0.0024=0.000486

σ_k = 0.022

University

σ_p^2 =0.4(1-0.4)/25 =0.0096

σ_k^2 = $(0.38)^2$*(0.0096)=0.00138624

σ_k = 0.037

Sierra Club

σ_p^2 =0.2*(1-0.2)/10=0.016

σ_k^2 = (0.35)*(0.35)*(0.016)=0.00196

σ_k = 0.044

Note that the errors in the government study are twice as small as those in the Sierra Club

5. Explain why the government study wasted funds relative to the study done by the University Biologists.

The government study sampled 4 times more habitat than the University, but their results and the margin of error overlap with the University findings. This means that accurate results can be found with the smaller sample size. This probably means the population is randomly dispersed so you don't need to do a massive survey to get accurate data.

6. Explain why the University Biologists are critical of the Sunshine Moonbeam study.

The Sierra Club study has the largest error of the three data sets, and it has a small sample size. This means it is probably not as accurate.

7. po=1-(1-.82)/.78 po=1-(1-.77)/.78 1-(1-0.72)/.78
po=0.77 po=.71 po=.64

I would say sunshine moonbeam is screaming because before the saw of chains came into the po (habit by females) and species were a lot higher giving them more habitable space, then what there is after the saw of chains.

And the new values are substantially higher the the p measured by the Sierra Club

Data Set 1 (from the Government Study)

- p = 0.6
- h = 0.45
- N_p = 100

Data Set 2 (from university biologists):

- p = 0.4
- h = 0.38
- N_p = 25

Data Set 3 (from the Sierra Club Study)

- p = 0.2
- h = 0.35
- N_p = 10

Critical Value:

$h_{critical} = 1 \quad k$

it h falls below this value, then species extinction will occur

Government study: K =0.82 +/- 0.02

h = 1 .82 = .18

h with error = 1 - .80 = .20

observed h – .45 so extinction is not imminent, about 25% more ecosystem can get developed (for that secret government lab)

University study: = 0.77 +/- .04

h – 1 - .77 – .23

h with error = 1 .73 = .27

observed h = .38 meaning that only about 11% more of the ecosystem can be develop; twice as less as the government would claim

Sierra Club study: = 0.72 +/- .05

h = 1 - .72 - .28

h with error – 1 -.67 – .33

observed h = .35 meaning that only 2% more of the ecosystem can be developed and the species is very much threatened

Because the value of h and 1-k are so far apart on the government study data, there is a long way to go before species x reaches critical habitat loss. Those data show that with the original amount of habitable area, the disbursement of the species could withstand habitat destruction to almost nothing before going extinct. On the other hand, the Sierra Club findings show that h is close to the critical value of 1-k, meaning not much more habitat can be lost before species x is extinct. If the government study is accepted, policy makers would believe that the habitat could withstand more development before affecting species x. This could lead them to allow a pipeline or strip mall to be built under the belief that it wont cause extinction. If the Sierra Club data is accepted, policy makers would have a better argument against further development. Because the university study is in the middle, it might cause some development to be allowed, which could still negatively impact species x, but critical habitat might not be reached with some development.

9) **Discuss the policy implications of the management of the Species X habitat depending on which of the 3 data sets is adopted as *the truth* ...**

- If data set 1 was adopted as the truth, the management of species X would be relatively hands off, because the species seems to be doing fine with its current amount of habitat, and will not go extinct assuming outside factors do not cause any issues.
- If data set 2 were adopted, there would possibly be need for intervention. The species won't go extinct but there should be some limitations put on how much of h can be developed.
- The specimens surveyed in data set 3 are the most likely to need intervention. The management of this population would need to be relatively good, because if other environmental factors or human development were to occur, the species could potentially die out, due to its small population and small h value relative to the other data sets.