STUDENT PAGES
Asiatic Black Bears: Conservation in Taiwan

Questions and Poster Presentations

By now, you should have already analyzed your data. So, it's time for Step 6 of the Scientific Process!

1. Develop Hypotheses
2. Use hypotheses to develop predictions
3. Design a scientific study to rigorously evaluate predictions
4. Collect data
5. Analyze and evaluate data
6. Use results from data evaluation to draw conclusions, and to inform new hypotheses
7. Share findings with peers, scientists, and the public

QUESTIONS from GIS Analyses

Go back and look at Hypotheses 1A and 1B. Look again at the corresponding predictions. Which Hypothesis (1A or 1B) was refuted by your data?

_____

_____

What conclusions can you make from the results of your GIS work?

_____

_____

_____

_____

Why do you think some bears went outside Yushan National Park? (Hint: do you think bears would have stayed inside the Park if all resources they need to survive and reproduce were within the Park?)

_____
_____
_____
_____

We know that the sample size of collared bears was small relative to many studies done on bears in the US and in Europe. Do you think that the small sample size affects our confidence level in results regarding Hypothesis 1? Why or why not?

_____

_____
_____

What other information would be good to collect about these wild bears to understand how this population is doing?

_____
_____
_____

How do Science and Conservation differ?

_____
_____
_____

OTHER QUESTIONS about GIS Analyses

Asiatic Black Bear Distribution

1. Name at least four countries in which Asiatic black bears have gone extinct.

    _____
    _____
    _____

2. Make the Yushan National Park layer visible and Zoom to it. What does the Asiatic Black Bear distribution data tell you about the bears in Yushan National Park?

    _____
    _____
    _____
    _____
    _____
    _____
    _____

Yushan National Park

1. What is the perimeter of the park in miles and in kms?

    _____
    _____

2. What is the area of the park in miles and in kms?

    _____
    _____

3. How many roads enter Yushan National Park?_____

4. How many trails are in Yushan National Park?

    _____

5. How many rivers and streams are in the Park?

    _____

Elevation

6. What are the elevation ranges for the N23E120.hgt and N23E121.hgt layers?

N23E120.hgt: lowest elevation= _____highest elevation = _____

N23E121.hgt: lowest elevation= _____ highest elevation = _____

Bear Data

1. What was the number of location points for each bear?

FA7_____
MA11_____
MA13_____
MA8_____
MS6_____

2. What is the area of each bears home range in km^2?

FA7_____
MA11_____
MA13_____
MA8_____
MS6_____

3. Which bear/s left Yushan National Park?

_____
_____
_____

4. WHEN did the bear/s leave the Park? (spring, summer, fall?)

_____
_____
_____

5. Open the data file for each bear individually (not the home range file). For each bear, find the 2 location data points that are the furthest apart and measure this distance in km. Write that distance for each bear in the spaces below:

FA7_____

MA11_____

MA13_____

MA8_____

MS6_____

The greatest distance across Yushan National Park is about 44 km. If a wild bear (that was not collared and part of this study) liked to hang out in the middle on Yushan National Park where it is most remote, is this bear necessarily safe? Why or why not?

_____

_____

QUESTIONS from Habitat Use Analyses

Go back and look at Hypotheses 2A and 2B. Look again at the corresponding predictions. Which Hypothesis (2A or 2B) was refuted by your data?

_____

_____

What conclusions can you make draw from the results of your Habitat Use analyses?

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More questions:

1. Based on your HABITAT USE analyses, which elevation zone/s did bears use the most in Fall?
   _____

2. Did this result make sense, based on the plant species available in this zone? Explain.
   _____
   _____
   _____

3. Which elevation zone/s did bears use the most in Summer?
   _____

4. Did this result make sense, based on plant species available in this zone? Explain
   _____
   _____
   _____

5. Which elevation zone/s did bears use the most during Spring?
   _____

6. Did this result make sense, based on plant species available in this zone? Explain
   _____
   _____
   _____

7. Based on your HABITAT SELECTION analyses, fill in the Ivlev's Index value for each elevation zone below:

0-500m _____
501-1000m _____
1001-1500m _____
1501-2000m _____
2001-2500m _____
2501-3000m _____
3001-3500m _____
>3501m _____

8. Which elevation zones were selected by the Formosan black bears?

_____

_____

_____

9. Which elevation zones were avoided by the Formosan black bears?

_____

_____

_____

10. Which elevation zones were neither selected nor avoided by the Formosan black bears?

_____

_____

_____

11. Go back and look at your answer to question 1 under the Bears section (what was the number of locations for each bear?). When we estimate habitat selection by wild animals, we collar some animals from the population. The animals we collar are considered a **sample** of the **population** of animals.

    a. Do you think that the number of collared bears you evaluated (5 bears) was large enough to represent the population of bears in Yushan National Park? Why or why not?

       _____
       _____
       _____

    b. Do you think the number of locations for each bear was large enough to represent how each bear used the area in and outside of Yushan National Park? Why or why not?

       _____
       _____
       _____

12. What limitations did Dr. Hwang face?

_____
_____
_____
_____
_____

13. Even though the sample size of bears was relatively small, and the number of locations for each bear was relatively small, why was this study so important?

_____
_____
_____
_____

GREAT! Now it's time to work on Step 7 of the Scientific Process!

1. Develop Hypotheses
2. Use hypotheses to develop predictions
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STEP 1: Create a poster that describes your findings. Include at least one map from your GIS work. Include the graph you created from your analyses of habitat use. Include information about findings from your analyses of habitat selection. Be creative! Also include information about the limitations of this field study (hint: Dr. Hwang and her crew were limited by extremely rugged terrain, so they could only capture 8 bears and the location data they were able to collect was relatively small... you analyzed only 5 of those 8 bears; how might this fact affect your conclusions?).

STEP 2: When your poster is done, you can upload onto Bear Trust International's VIRTUAL POSTER SESSION. To upload, contact Dr. Melissa Reynolds-Hogland: melissa@beartrust.org

Written by Dr. Melissa Reynolds-Hogland, Dr. Hwang, and Gwen Eishen