

### Analyzing the DNA Datasets discussion

In the slideshow, analyze DNA datasets and overview maps to predict breeding levels between bighorn sheep populations with and without highways.

- a. Use the prepared slideshow and datasets to help students learn how to analyze the datasets – particularly the meaning of the arrows and the mountaintop names.
- b. The slideshow begins by reminding students of Dr. Epps' test question about how highways might affect bighorn sheep.
- c. Using the overview slide, ask students to consider how a highway that runs between two sheep populations might affect their mating habits.

#### Discussion

**Key Idea: Highways cause habitat fragmentation, which may lead to inbreeding.**

**Question:** How would a highway running through two sheep populations affect their mating habits? Look at this overview map. What predictions can you make about the mating habits of bighorn sheep populations?

**Answer:** Populations that are cut off from each other by roads will not show large levels of interbreeding and vice-versa.

**Question:** How would a highway that runs through two sheep populations affect their mating habits?

**Answer:** It would cut the male sheep off from the different populations, which would decrease the level of breeding.

- d. On the next slides ask the class to make predictions about the bighorn sheep populations interbreeding, first based on proximity, then accounting for barriers presented by highways.

#### Discussion

**Key Idea: Geographic distance and highways affect breeding between populations..**

**Question:** This is a close up of Cady Mountain. Based only upon geographic distance, with which population would you expect Cady Mountain sheep to show more signs of mating, Granite, Old Dad, or Newberry? Why?

**Answer:** Newberry, because it is closest to Cady Mountain.

**Question:** If highways block bighorn sheep breeding, which population would you expect Cady Mountain sheep to show the LEAST signs of mating, Granite, Old Dad, or Newberry? Why?

**Answer:** Newberry Mountain, because it is separated from Cady Mountain by a highway, which isolates the populations from each other.