

Westwide Bighorn Sheep Genetics and Genomics Initiative, July 2018

Types of questions that geneticists and managers have developed (not an exhaustive list!):

- 1) Taxonomy
 - How do we manage systems set up with, or previously managed under, possibly outdated classifications? First we need to understand the evolutionary history.
 - Example: California versus Rocky Mountain bighorn “subspecies”
 - Example: Thinhorn sheep

- 2) Population structure
 - What populations of bighorn sheep are connected?
 - Which are genetically diverse (relatively speaking)?
 - Which are genetically similar due to translocation history?
 - Where are subspecies or differently-managed populations mixing?
 - Implications for disease spread, demography, genetic diversity

- 3) Adaptive genetics/genomics
 - Can we identify markers or genetic variants that are important for adaptation to different environments or pressures (e.g., disease)?
 - What genes are “turned on” under different environments or pressures?

- 4) Screening for markers associated with disease or other traits
 - What role do genetic differences play in responses to respiratory and other disease?
 - Analyzed at the individual level but need large data sets

- 5) How does genetic diversity or local adaptation influence population performance?
 - Again, how much does genetic diversity or adaptation affect demography, response to disease, etc?
 - Opportunity to tie into population-level metrics from DMV