

Conservation Genetics Practice Problems #1

- 1) What was the proportion of polymorphic loci reported in Corbin et al. 1974?
- 2) Four microsatellite loci are used to describe population genetic structure in Gunnison Sage-grouse. After genotyping 25 individuals, the following alleles are present:
 - Microsatellite 1: ACTACTACT, ACTACT
 - Microsatellite 2: GCAGCA, GCAGCAGCA, GCAGCAGCA, GCAGCAGCAGCA
 - Microsatellite 3: CGCGCG, CGCGCGCG
 - Microsatellite 4: ACGC, ACGCACGC

What is the average allelic diversity of this sample?

- 3) The same population is later studied using sequences for three nuclear introns. At these loci, 5/25, 0/25, and 10/25 individuals are heterozygous. What is the average heterozygosity of the sample?
- 4) What are the expected genotype frequencies for a *triallelic* locus A (where $f(A_1) = p$, $f(A_2) = q$, and $f(A_3) = r$) after one generation of random mating? (Your answer should be algebraic.)
- 5) Samples ($n = 20$) from a population of bitterroot (*Lewisia rediviva*) are genotyped at a diallelic locus B , with alleles B_1 and B_2 . 10 individuals have genotype B_1B_1 , 8 individuals have the genotype B_1B_2 , and 2 individuals have the genotype B_2B_2 . Is this population under Hardy-Weinberg Equilibrium? If not, what is the probability of getting genotype frequency deviations as extreme as those seen in your sample assuming the population really *is* under HWE?