

CHAPTER 15 Answers to Problems

Problem 15.1. See the paper by [Grant and Leslie \(1993\)](#) [hotlink to pdf] for a discussion of this issue.

Problem 15.2. See Figure 15.1.

Problem 15.3. In the case of complete isolation, different alleles will be fixed by chance in different subpopulations. Therefore, heterozygosity in the global metapopulation (H_T) will become “frozen” and will not decline (see Figure 15.4). However, the absence of immigration will cause more rapid decline in local heterozygosity (H_S) than would occur if there was some gene flow into each subpopulation.

Problem 15.4. Wright assumed that extirpated local populations were recolonized by a few individuals from a single local population. Slatkin also considered the case where extirpated local populations were recolonized by a varying number of individuals that may have originated from several other local populations.

Problem 15.5. In general demographic connectivity requires more individuals than genetic connectivity. Remember, genetic connectivity is primarily determined by the number of migrants while demographic connectivity is primarily determined by the proportion of migrants. Therefore, with large local effective population sizes, ten or so individuals would be sufficient for genetic connectivity but not for demographic connectivity (see Table 16.4).