18.3A: Hybrid Zones

Over time, two species may further diverge or reconnect, depending on the fitness strength and the reproductive barriers of the hybrids.

Learning Objectives

- Discuss how the fitness of a hybrid will lead to changes in the hybrid zone over time

Key Points

- After speciation, or sufficient evolutionary change for one species to become two distinct species, the two species may continue to co-habitate and interact.
- The area in which two closely-related species interact and reproduce is known as the hybrid zone; their offspring are known as hybrids.
- Depending on the fitness of the hybrid offspring relative to the parents, the two species may either stay as two distinct species (reinforcement), or become one species again (reconnection).

Key Terms

- **hybrid zone**: an area where the ranges of two interbreeding species meet and interbreed
- **hybrid speciation**: the formation of a new species as the direct result of mating between members of two existing species
- **reconnection**: a convergence of two species over time
Reconnection After Speciation

Speciation occurs over a span of evolutionary time. When a new species arises, there is a transition period during which the closely-related species continue to interact.

After speciation, two species may recombine or even continue interacting indefinitely. Individual organisms will mate with any nearby individual with which they are capable of breeding. An area where two closely-related species continue to interact and reproduce, forming hybrids, is called a hybrid zone. Over time, the hybrid zone may change depending on the fitness strength and the reproductive barriers of the hybrids.

![Changes in the Hybrid Zone over Time](image)

**Figure 1**: Speciation and the Hybrid Zone: After speciation has occurred, the two separate-but-closely-related species may continue to produce offspring in an area called the hybrid zone. Reinforcement, fusion, or stability may result, depending on reproductive barriers and the relative fitness of the hybrids.

Hybrids can have less fitness, more fitness, or about the same fitness level as the purebred parents. Usually, hybrids tend to be less fit; therefore, reproduction to produce hybrids will diminish over time, which nudges the two species to diverge further in a process called reinforcement. This term is used because the low success of the hybrids reinforces the original speciation. If the hybrids are less fit than the parents, reinforcement of speciation occurs, and the species will continue to diverge until they can no longer mate and produce viable offspring.

If the hybrids are as fit or more fit than the parents, or the reproductive barriers weaken, the two species may fuse back into one species (reconnection). For a hybrid form to persist, it will generally have to be able to exploit the available resources better than either parent species, with which, in most cases, it will have to compete.

Over time, via a process called hybrid speciation, the hybrids themselves can become a separate species. Reproductive isolation between hybrids and their parents was once thought to be particularly difficult to achieve; thus, hybrid species were thought to be extremely rare. With DNA analysis becoming more accessible in the 1990s, hybrid speciation has been shown to be a fairly common phenomenon, particularly in plants.

Scientists have also observed that sometimes two species will remain separate, but continue to interact to produce some hybrid individuals; this is classified as stability because no real net change is taking place. For a hybrid zone to be stable, the offspring produced by the hybrids have to be less fit than members of the parent species.