CO-EVOLUTION FACT SHEET

Organisms – from humans to insects to plants – have all evolved from a common ancestor and over time have adapted to a wide range of environments, producing the rich biodiversity seen in nature today. But organisms are not in isolation during this process. An essential part of evolution is how organisms interact with one another and how they change from generation to generation because of those interactions – what scientists call co-evolution.

What many do not realize is that all species – even humans – play a role in the evolution of the natural community. Considering 99 percent of all species that have inhabited the planet are now extinct, the importance of *Butterflies + Plants: Partners in Evolution* is clear: The more people understand biodiversity and the evolutionary and ecological processes that form all life, the more they can fully appreciate and conserve life as it exists today.

Co-Evolution at Work:

- **The star orchid and giant hawk moth from Madagascar.** When Charles Darwin first saw the Madagascar star orchid, which produces nectar at the bottom of its narrow, foot-long spur (throat), he predicted the existence of a moth with a proboscis (tongue) long enough to reach that nectar. Decades later, the giant hawk moth was discovered. Today, the hawk moth continues to use its 8-inch-long tongue to drink nectar from the orchid and, in the process, plays an important role in the orchid's pollination process.

- **The milkweed beetle.** Some plants, like milkweed, give off a sticky, poisonous substance, called latex, to protect themselves from plant-eating insects. Throughout generations, milkweed beetles have learned to outsmart these plants by cutting veins in the leaves to drain the poison. Once the substance has fully drained, the beetles are able to feed safely.

- **Butterflies and their brilliant colors.** Butterflies have evolved amazing colors that enable them to hide from predators by blending in with plants at all stages of their life cycle. For example, the young Swallowtail caterpillar bears an uncanny resemblance to bird droppings and the chrysalis of the Spicebush Swallowtail can easily be mistaken for a stray leaf.

- **The Giant Saguaro Cactus and the Lesser Long-tongued Bat.** The cactus, recognized as the symbol of the desert southwest, survives with the help of this endangered bat. Each cactus flower lasts for only one night each spring. The flower's large size, white color, strong scent and copious nectar attract the bats. As the bats lap up nectar with their long tongues, pollen sticks to their faces and is transferred from flower to flower.