



# Plant and Animal Interactions

The Basics, as seen at San Francisco Botanical Garden

## The Interrelationships of Plants and Animals at the SF Botanical Garden

All living things depend upon green plants. Plants provide the oxygen necessary for life and are the basic source of food for all other living things. The sun is the primary source of energy on earth, but only plants are able to produce their own food by capturing the sun's energy during photosynthesis. That energy is what powers nearly all other life on earth. Beyond that fundamental need, relationships between plants and animals have evolved over time in many complex ways. The study of how plants and animals interrelate and affect their environment and are affected by it, is called ecology, coined 100 years ago from two Greek words meaning "the study of home".

The San Francisco Botanical Garden is home to thousands of species of plants and many insects, birds, mammals, amphibians and reptiles. It is an environment that has been created by humans to reflect nature. In effect many different habitats or environments have been created here. Amazingly, in 55 acres in the middle of an urban environment we may observe the web of life in forests, meadows and ponds. In a small space and a short time we may use our senses to observe, describe, compare, make discoveries, communicate, draw conclusions about and enjoy the plant world and the animals who have made homes here. The various Garden habitats show us many ways animals and plants interrelate.

### **Plants depend on animals in a variety of ways which can be observed in the Garden:**

Pollinators help plants produce seeds by transporting pollen grains from one flower to another, permitting fertilization of ovules which become seeds borne in fruit (bees, butterflies, hummingbirds, bats).

Seed dispersers help seeds travel and germinate, sometimes by caching seeds and forgetting about them, sometimes by transporting seeds within their bodies and sometimes by carrying them on their fur or feathers (squirrels, jays, robins, coyotes).

Recyclers decompose dead plants, eating the dead plant material and excreting the remnants, thus creating soil and making nutrients available to plants (pill bugs, slugs, snails).

Allies protect against plant eaters such as aphids, slugs or even large herbivores (ladybugs, mantids, biting ants).

**Animals use plants in many different ways which may be observed in the Garden:**

Food is essential to all animals. All parts of the plant may provide nourishment - gophers eat roots, aphids suck juice out of stems, caterpillars eat leaves, hummingbirds eat nectar, bees collect pollen to feed their young, robins eat berries.

A place to catch food, whether a branch to fish from, a support structure for a web, or a place where important prey can be found.

Shelter keeps animals safe from predators, whether quail hiding in salt bush, squirrels staying safe in trees, or small birds hiding in thorny thickets.

Home sites for building webs, nests, dens, homes and materials to construct, line nests and dens allow animals to successfully reproduce.

**People have a significant impact on the web of life all over the earth. This may be observed in some specific ways in the Garden.**

We protect, preserve, create habitats for plants and animals in the Garden by providing water, soil enrichment and ongoing care.

We feed animals, sometimes encouraging unnaturally large populations and upsetting the balance in the ecosystem (i.e., ducks, non-native squirrels, feral cats).

We control insects and weeds mostly by mechanical means or more natural means, occasionally through chemical means, based on Integrated Pest Management protocols.

Understanding the web of life is the cornerstone of responsibility. Observing the small world of San Francisco Botanical Garden helps us to understand the interconnectedness of all life. From that understanding may grow the sense of responsibility for our planet and all its habitats full of creatures and plants.