

Ecologist Corner #3: Riparian Forests and the Food Web in Alameda Creek

Riparian forests occur along rivers and creeks where there is fertile soil and an ample water supply. These forests appear as a green belt along water courses, and are one of the most striking features of California's landscape.

The dynamic nature of California creeks and rivers creates numerous habitats within these productive systems, which helps to explain why riparian forests in California support a greater diversity of wildlife than any other habitat type.

Healthy native fish populations require a healthy in-stream food web. The leaves, branches, and other organic matter input into creeks and rivers from riparian forests form the base of this food web.

When leaves fall into a stream they release a lot of organic matter— making a sort of “leaf tea” in the stream. This organic matter is eaten by bacteria and fungi in the stream, which themselves are sources of food for the insects and other invertebrates that live in there. Mayfly and caddisfly larvae in particular like these bacteria and fungi. Steelhead and rainbow trout fry will also feed on these algae, bacteria, and fungi.



Above: Alameda Creek's riparian forest appears as a ribbon of dark green through Sunol Regional Wilderness. The smaller ribbons denote the riparian forests and woodlands of its smaller tributaries.



The surfaces of the fallen leaves are colonized by algae and microbial organisms that further the decomposition process. It takes a few weeks of feeding by these microorganisms before the leaves reach a state where they're considered palatable by stream insects. A group of insects called

Left: Leaves that fall into streams and rivers are an essential component of the in-stream food web.



“shredders” are the first to feast on the leaf litter. Shredders transform the big, rotting leaves into smaller rotten leaf bits. These leaf bits become important food for “collectors” such as many of the caddisflies and mayflies in our creeks. Collecting insects are filter feeders that lie in wait on rocks, logs, and other surfaces and capture organic matter and leaf debris as it flows downstream. Predators like dragonflies, damselflies, and stoneflies feed on other insects. All of these stream insects are an important component of the diet of growing steelhead trout, rainbow trout, and the other native fish in our watershed, like roach, hitch, and sculpin.

Aquatic insects are an important piece of the food web of many of our native fish in Alameda Creek.

Top pair: Stonefly larva and adult

Middle pair: Caddisfly larva and adult

Bottom pair: Mayfly larva and adult



When riparian trees are removed the stream is deprived of its source of food. Food can also be removed from streams by taking out snags and debris, or by straightening the stream. The snags and bends in a stream catch and hold leaves, and keep them from washing downstream. They are rich pockets of food for young fish.

Riparian forests also slow bank erosion and create habitat for fish. The interwoven roots of riparian trees create overhanging banks that often hide deep pools. These pools are sheltered from overhead predators and provide refuge for fish during high flows. Partially decomposed leaves often collect at the bottom of these pools, creating a rich environment for fish seeking refuge there.

Maintaining and improving riparian forests is an important component of the restoration of steelhead trout and our native fisheries in Alameda Creek. Plant a tree and help grow a trout!

Below, clockwise from top left: (1) Snags and debris in the stream create rich pockets where organic material collects; (2) The roots of riparian trees help stabilize banks and reduce soil erosion; (3) A riparian tree (bigleaf maple) creates an overhanging bank with a pool; (4) The pools created can be deep and provide important refuge for fish both during high flows and as cool pockets of water in the summer.

