

## Restoration Fact Sheet: In-stream Habitat Structure

**Natural conditions:** Healthy coastal streams contain complex in-stream structures that serve to reduce, or break up, the force of flowing water, and create an array of habitat features required by aquatic life, especially juvenile and spawning salmonids.

### TOOLS

In-stream structure: **Large Wood**, or large logs and root wads are strategically placed in the stream channel using heavy machinery, a series of cables and pulleys, and very skilled operators. Large boulders are sometimes used in conjunction with LWD. Each structure piece must fit a size and length requirement depending on the specific site characteristics. Appropriate sized conifer logs will last for decades in the stream.

Historically, large wood was very common on the forest floor and in streams, and has played a significant role in the forming of stream channels and evolution of fish life cycles.

### NEEDED WHERE

- The stream bed is scoured down to bedrock, or deficient in spawning gravel.
- The channel has been straightened or simplified and the resulting flow of water is causing erosion downstream.
- In-stream structure was removed in past stream “cleaning” projects.
- Salmon rearing habitat is lacking.

### EFFECTS

Overtime, large wood and boulders will naturally:

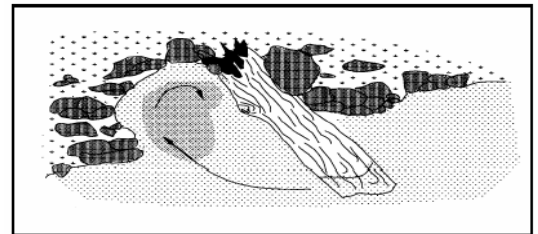
- Create pools and other slack-water areas—crucial during times of high winter flows.
- Create stable pockets of spawning gravel.
- Encourage natural meanders and / or stair-step pools.
- Provide young fish with cover from predators.
- Provide habitat for aquatic insects (not mosquitoes)—primary food source for juvenile salmonids.

### CONSIDERATIONS

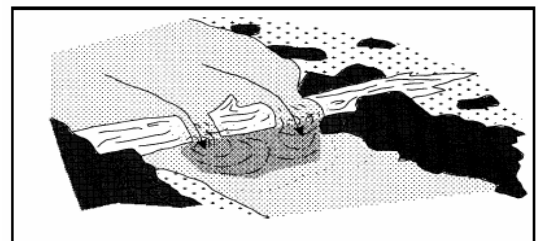
- Before installing in-stream structure it is important to have good bank stability.
- Riparian areas, though usually quick to heal, may need some replanting after installation of in-stream structures.
- In-stream work can only be done during a specific in-stream work period for that stream so that the work doesn't effect salmon cycles.
- Technical design of large wood and boulder placements attempts to mimic nature, can be aesthetically pleasing, and will have long-term, positive, biophysical affects on the stream system.



Logs placed on Willanch creek.



Log-formed backwater pool: Found along channel margins and caused by eddies around a large woody debris obstruction. These pools are usually shallow and are dominated by fine-grained substrate. Current velocities are quite low. (CA Dept. of Fish & Game, 1998)



Log-formed plunge pool: Found where the stream passes over a complete or nearly complete channel obstruction and drops steeply into the streambed below, scouring out a depression; often large and deep. Substrate size is highly variable. (CA Dept. of Fish & Game, 1998)