



Large woody debris (LWD) at Alamitos Creek.

Fallen tree or large woody debris?

Many creeks and rivers across Santa Clara County are bordered by large trees. Over time, these trees may die, break or fall into the stream channel due to natural causes such as erosion or storms. Some of these fallen trees are removed, while others remain in the waterway and become known as large woody debris (LWD).

LWD can include entire trees, stumps or sizable branches that have entered a creek. But what qualifies as large? At Valley Water, the Stream Maintenance Program (SMP) defines large woody debris as any piece of woody material that is at least 12 inches in diameter and a minimum of 6 feet in length.

This definition, adapted from the California Salmonid Stream Restoration Manual by the California Department of Fish and Wildlife, is applied to fallen trees in streams that support sensitive fish species—many of which are found in Santa Clara County's major waterways and tributaries. Woody debris of this size typically has the greatest ecological and hydraulic impact on river and stream systems.



LWD protrudes from the Alamitos Creek waters during a storm event.

How is large woody debris beneficial?

LWD plays a vital role in creating and maintaining complex, diverse aquatic habitats within creeks. Its presence benefits the ecosystem in several important ways:

- **Provides shelter:** Offers refuge for juvenile and adult fish, protecting them from predators and high winter flows.
- **Captures organic material:** Creates feeding and breeding grounds for aquatic insects that serve as a food source for fish and other organisms.
- **Traps gravel:** Forms essential areas for spawning and feeding for both fish and aquatic invertebrates.
- **Shapes channel complexity:** Helps form pools, riffles and runs by dissipating energy and promoting scour.

These natural functions are critical for supporting sensitive species such as Steelhead trout, California red-legged frogs and Western pond turtles—all of which depend on the diverse habitats LWD helps to sustain.



Valley Water's right-of-way defined

Valley Water manages LWD on lands it owns or manages through easements. Valley Water's right-of-way includes the following types of properties:

- **Fee title property:** Land owned outright by Valley Water, managed in accordance with available resources and in compliance with federal, state, and local laws and regulations.
- **Exclusionary easements:** Properties where Valley Water holds an easement that effectively excludes the underlying property owner from active use of the land.
- **Functional easements:** Areas where Valley Water has rights for specific purposes such as flood protection, stormwater drainage or water conservation.

Valley Water's treatment of LWD on these properties is guided by both environmental and operational priorities, with an emphasis on balancing habitat preservation and infrastructure protection.



Large woody debris and Valley Water

While the instinct may be to remove fallen trees from streams, Valley Water works to strike a careful balance between flood protection and environmental stewardship. Whenever feasible, LWD is left in place and maintained due to its ecological value.

However, in certain cases, LWD can pose risks—such as accelerating erosion near flood protection infrastructure or forming debris jams in sensitive areas. When LWD is encountered, a team of qualified professionals, including engineers and biologists, evaluates its habitat value and potential hazards.

If the wood is determined to present a threat, Valley Water first explores options to modify it—such as trimming branches or repositioning the material within the channel—to retain as much habitat function as possible. If these measures are insufficient to reduce the risk, full removal may be necessary.

Under the SMP, removal of LWD must be mitigated by replacing it in kind within the same watershed, to offset the loss of ecological benefits. Because of this, removal is considered a last resort, only pursued when no other alternatives are viable.

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