

# Woody Debris in Streams & Rivers

Riparian forests — those areas of woods along streams and rivers — play an important role in protecting water quality. However, these areas are a source of large woody debris that can fall or be washed into streams and rivers, including tree limbs, logs and root wads — a tree's uprooted root mass and surrounding soil.

To some people, large woody debris looks unsightly. There is even a common perception that large woody debris in streams and rivers increases flooding. However, natural woody debris is beneficial to aquatic ecosystems and may actually reduce flooding, at least from smaller storms.

## Benefits

Ecologically, large woody debris within streams and rivers provide habitat for various aquatic organisms. It is a source of detritus — small particles of organic matter — which is the beginning of the entire aquatic food chain. Woody debris helps trap leaves and twigs that provide nutrients for aquatic insects, which in turn provide food for fish. Woody debris helps to regulate water temperature by shading areas within the stream. It also provides places for fish and wildlife to hide. Research shows that large woody debris within streams and rivers increase biodiversity.

Research also indicates that large woody debris can

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# Town of Hillsborough Information Sheet



Large woody debris, like this log in the Eno River, provide ecological benefits and can reduce downstream flooding.

# What is a Riparian Forest?

Riparian forests are naturally wooded areas immediately adjacent to streams and rivers. They provide important ecological benefits and help protect water quality. Riparian forests also filter pollutants such as sediment, nutrients (nitrogen and phosphorus), and pesticides. They control erosion and keep stream banks from collapsing. Riparian forests also help reduce flooding, moderate stream temperature, and provide wildlife food and habitat.

For these reasons, riparian forests are regulated in Hillsborough. The town enforces a 50-foot riparian buffer measured from the top bank on either side of intermittent and perennial streams, including the Eno River. Impacts to the regulated riparian buffer require written authorization. Please contact the Hillsborough Stormwater and Environmental Services Division if you plan to impact the riparian buffer in any way.

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reduce downstream flooding. It helps slow the flow of water and dissipates energy. Woody debris increases the "roughness" of the channel, which in turn slows the flow of water. Slowing the flow allows it to pass through culverts and other downstream infrastructure more readily. Large woody debris also helps to protect streambanks from erosion. Woody debris acts as armor for streambanks, and it also traps sediment and organic matter while redirecting flow. This helps maintain channel stability and reduces scouring of the stream channel.

## Issues

In some instances, significant amounts of large woody debris can impact flows by blocking bridge and culvert openings.

Obstructing flow through infrastructure not only causes flooding upstream of the infrastructure, it can also damage roadways and other structures by forcing water to flow around the bridge or culvert. When debris collects in these places, it makes sense to remove it, although studies have shown that preemptive programs to remove large woody debris are almost useless because new debris is transported and deposited after each major rain event.

#### What the town does

For these reasons, the town only removes large woody debris from streams and rivers on a case-by-case basis.

As part of its stormwater infrastructure maintenance program, the Hillsborough Public Works Division periodically inspects culverts and bridges for accumulations of large woody debris and will remove it when necessary. Otherwise, large woody debris is left to provide the benefits described above.



This fly fisher knows that large woody debris provides habitat and cover for fish and that it makes sense to cast all around it. This picture also shows how woody debris slows the flow of water and traps



Large wood debris partially blocks this old stone culvert underneath the railroad near Exchange Club Park. This could result in flooding upstream of the culvert. In this case, the debris should be removed.

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