

Sullivan Run Large Woody Debris Project

In the summer of 2020, the Connoquenessing Watershed Alliance piloted a new type of stream habitat improvement methodology in Butler County in conjunction with the Pennsylvania Fish and Boat Commission (PFBC) known as Large Woody Debris (LWD) Installation. This stream habitat improvement looks to add woody vegetation into the stream channel, creating habitat diversity for fish species and food and habitat for aquatic macroinvertebrates. Another benefit to this type of improvement is the reconnection of the stream channel with the floodplain, allowing high water events to deposit sediments outside of the stream channel, protecting eroding stream banks and dissipating energy before moving downstream.

After consulting with the PFBC, it was determined that this would be the best type of habitat device for a section of Sullivan Run in Alameda Park in central Butler County. Sullivan Run is a small, second-order stream in this section of the park, with an overly-wide stream channel due to previous flooding events. An upstream section of the creek was chosen for more conventional stream habitat improvements, such as log cross vanes and mud sills, due to ease of access and recreational capacity. The lower section of Sullivan Run in the park runs in a relatively steep valley, with little machine access and a heavy forest canopy, before entering the city of Butler and becoming channelized. Due to the nature of the stream valley in this section, and large sections of wetlands already present in the floodplain, the installation of LWD was chosen as the preferred method of habitat improvement.

Large Woody Debris is a GP-1 permitted Fish Habitat Enhancement Structure, and requires approval from both the PFBC and PA Department of Environmental Protection. Some considerations and best practices that are followed when adding LWD to a stream include:

- Locate areas lacking in pools and habitat diversity
- Introduce 2-4 pieces of LWD per 100 foot stream section
- Minimum 10 inch diameter at the base
- Minimum length of twice the bank-full width
- Trees should not be directly streamside, but directed them into the stream
- At least a quarter of the tree should be on the bank outside of the channel to reduce chances of movement during high water events

On two days in the beginning of July, a crew consisting of members of the Connoquenessing Watershed Alliance, PA Fish and Boat Commission, and Western Pennsylvania Conservancy completed LWD installation on a 3,000 foot section of Sullivan Run. When the project was completed, 80 trees had been felled into the stream, creating immediate overhead cover for fish and aquatic organisms. Over time, these areas will create new pool habitats in the stream channel, providing additional feeding areas for fish and protection from predators. These newly-created devices will also serve to collect debris as it washes downstream, keeping it in the floodplain and preventing it from enhancing flooding concerns in the downstream channelized urban area.

Some images from the installation:

Before and After



