Green Infrastructure for Dealing with Stormwater

by Sandy Guldman
2022

Flooding continues to be a problem in the Ross Valley and it's clear that to make major progress in reducing the flood risks, we need a combination of detention of creek flows and increased channel capacity, including restoration of flood plains wherever possible. That is a tall order. The communities of San Anselmo and Fairfax have been hostile to detention basins, and private property ownership complicates the task of increasing channel capacity. However, we can make some progress by implementing green infrastructure projects. Most of these will be modest in size and scope, but, if the concept is pursued consistently, cumulatively they will make a significant difference.

In 2019, Congress enacted the Water Infrastructure Improvement Act, which defines green infrastructure as "the range of measures that use plant or soil systems, permeable pavement or other permeable surfaces or substrates, stormwater harvest and reuse, or landscaping to store, infiltrate, or evapotranspirate stormwater and reduce flows to sewer systems or to surface waters."

Just a few of the benefits of green infrastructure are: reducing peak flow during rainstorms to mitigate flooding; cleaning the water as it filters though the soil; and recharging groundwater that supports cooler stream flow in the summer. Candidates for retrofitting with green infrastructure are parking lots, landscaped areas that presently drain directly into storm drains, and roof drains that can be diverted into swales.

The median strip along San Anselmo's Miracle Mile was redesigned as a swale. Photo by Siegfried Engineering

The Red Hill Swale in San Anselmo**,** a Town of San Anselmo project, designed by Siegfried Engineering, and funded by an anonymous donor, is an outstanding example of green infrastructure. The project occupies about 2,000 feet of the median of Red Hill Avenue between The Hub and Hilldale Avenue. It functions as a small detention basin with a capacity of 3,000 cubic feet.

Another green infrastructure project, along Center Boulevard in Fairfax, receives drainage from the parking lot of the Fair-Anselm Center. This project demonstrates that it isn't necessary to have a large area to install green infrastructure. The newly landscaped area around RH Marin on the east side of The Village shopping center in Corte Madera is more ambitious. The low-impact development elements include use of permeable pavement and creation of rain garden bioretention areas. Bioretention areas encompass approximately 4% of the paved area, with the total landscaped area comprising approximately 11% of the site. All stormwater is filtered before it is discharged. A third local example is the bioswale at the east end of the Rose Lane development beside a tidal section of Larkspur Creek. Full trash capture storm drains that serve about 70% of the development feed into this capacious swale, where it infiltrates into the soil rather than flowing directly into Larkspur Creek. Even when local areas were flooding on October 24, 2021, this swale was well under capacity.

Retrofitting parking lots with swales and rain gardens is an obvious priority. Almost every school, shopping center, commercial building, and apartment building has a parking lot. They are located all over the watershed from Fairfax to Larkspur and Corte Madera. Let your local officials, school districts, and

businesses know that they could help reduce flooding, one step at a time, by installing green infrastructure. Urge jurisdictions to require green infrastructure whenever building permits are issued.

Another good step is to oppose the installation of artificial turf on playing fields. In addition to their many other disadvantages, rainwater quickly passes through the plastic faux grass and substrate, leaching chemicals in the process, and delivers it to local storm drains and creeks. This degrades water quality and promotes flooding.

The information below from MCSTOPPP will help you plan a green infrastructure project, also known as Low-Impact Development or LID, for your own property. Consider redesigning your drainage to reduce water quality impacts. Rain runoff carries pollutants to creeks and other water bodies. When rain flows over hard surfaces the speed and volume of water can cause creek erosion downstream. For ideas on how to use Low-Impact Development design to protect fish and other wildlife in Marin's creeks, explore the resources below and consider implementing the following practices:

- Disconnect downspouts to let water run off your roof onto a splash block and into landscaped areas.
- Install a rain barrel.
- Slow down your roof runoff by connecting rain chains to your roof gutters.
- Use mulch on plant beds to slow the flow in areas where water can seep in.
- Consider installing a rain garden.

LID and stormwater-friendly development resources:

- LID: A Sensible Approach to Land Development and Stormwater Management, from the California Water and Land Use Partnership
- Blue-Green Building: Water Friendly Development in the East Bay
- Using Bioretention on Residential Lots: How to incorporate bioretention facilities into residential lots including how to calculate sizing
- Slow It. Spread It. Sink It: Rainwater Capture and Management.
- BASMAA Rain Gardens Fact Sheet: a four-page technical guide on how to build a rain garden