



BIOFILMS

* Conservation & biodiversity

The photos taken in the Sanctuary draw attention to something most people don't notice at all: the thin films coating rocks and water at the brook's edge. These freshwater biofilms, built from bacteria, algae, fungi, and other microscopic passengers, are some of the **most diverse communities in a stream** (Besemer, 2015; Sentenac et al., 2021). The photographs highlight a key conservation goal of the Sanctuary of protecting the conditions that let these delicate, microbially rich films develop. Because the brook's flow changes with rainfall, sometimes drying near the lower bridge and receiving bursts of organic matter from falling leaves, the art showcases organisms that are highly **sensitive to disturbance and act as natural indicators of ecosystem health** (Bonet et al., 2023) (Bonet et al., 2023). Showing biofilms at this scale helps communicate their ecological value, how biodiversity **extends beyond plants and animals**, making conservation more understandable to visitors (CSIRO, 2023).

* Bottom-up/top-down context *

In this first-order forest brook, biofilms are the **foundational trophic layer**. They grow on submerged wood, stones, and autumn leaves drift into the water, using those leaves as fuel for microbial succession through the fall months (Besemer, 2015; Sentenac et al., 2021). From there, grazers and detritivores feed on the films, and their energy moves upward to predators, including fish and even the ducks that stop at the pond. The Sanctuary's hydrology makes these communities especially sensitive. Long dry spells near the lower bridge or rapid shifts in discharge can **strip or desiccate biofilms, changing their structure and reducing diversity** (Bonet et al., 2023).



* Ecosystem services

The biofilm communities highlighted in the artwork provide several core ecosystem services. As regulators, they **purify water by absorbing and transforming nutrients, metals, and organic compounds** (Bonet et al., 2023; Sentenac et al., 2021). Their role in nutrient recycling of **breaking down leaf litter and releasing usable forms of carbon, nitrogen, and phosphorus** supports provisioning services by producing the microbial biomass that feeds invertebrates and, indirectly, higher predators (CSIRO, 2023). Biofilm shows cultural value because its colors, textures, and patterns record how a surface interacts with its environment over time, creating a visible trace of history. (Sanmartín et al., 2023; Charron et al., 2023). By drawing attention to these subtle patterns, the photos reinforces the conservation value of **protecting first-order brooks**, which are important to biodiversity and to the functioning as a whole.



* Make your own art!!!! *

I encourage you to also photograph nature you find here – post your art to your Instagram account and tag: **@agreenerblue**

