Periphyton Field Identification Guide

Introduction

Periphyton (attached algae) is grouped into four broad types based on its growth form.

Periphyton types included in the assessment – periphyton recorded and scored includes two types: filaments and mats. Some types of mat periphyton are well-known "nuisance species". These include *Microcoleus* (toxic algae or cyanobacteria) and didymo. They are recorded separately.

- Filaments
- Mats
    - *Microcoleus* (toxic algae)
    - Didymo

Moss is also included*,* even though it is not periphyton. It is recorded along with periphyton because it grows in similar places (on rocks on the stream bed) and it forms habitat for benthic macroinvertebrates (stream bugs). *Moss is not used in the calculation of the periphyton score.*

Periphyton types not included – you should know how to recognise these types of periphyton but you will not need to record them.

- Thin films
- Sludge

Filaments

Filaments can be distinct long strands or short hair-like filaments that look like ‘wet wool’. Green filaments (usually fine) can be long or short and may have a tufted appearance. Brown filaments can be fine or stringy.

Filaments can vary from bright green to yellow or brown.

Underwater, this brown algae will appear as brown filaments

Mats

Mats vary from fluffy to granular, “sludgy”, slightly hairy or fuzzy, to more-or-less smooth. Colour ranges from pale brown to yellowish, reddish-brown, dark brown, various shades of green, to almost black-coloured. It sometimes has a mixture of dark and light-coloured areas. Some mats have a jelly-like appearance and form rounded masses, either green or brownish.

Mats can appear as discontinuous “bobbles” with film in between. They are more cohesive than sludge (which falls apart easily).

These firm, jelly-like nodules are classified as mats. Do not confuse with didymo, which has a fibrous texture (not jelly-like).

Mats of the diatom *Gomphoneis* look like didymo but are finer and slimier.

Microcoleus (“toxic algae”)

A cyanobacteria previously called *Phormidium*. Recorded separately from other mats because it can be toxic. It grows as smooth, fine mats that peel off easily. Colour varies from black to dark green, to paler brown, mottled or even light green; often greyish underneath. May overgrow other algae. Has a distinctive musty or earthy smell.

Didymo

Didymo (also called “rock snot”) is an introduced species that has become a nuisance in some South Island rivers. It has a tough fibrous texture (not slimy) when squeezed; individual cells may be visible as tiny dots.

Moss

Aquatic mosses look like those found on land. They grow in tufts and have small, dark-green leaves (usually about 1-2 mm long).

Thin films

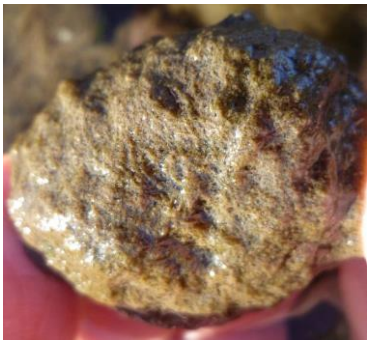
A thin film of periphyton growth gives rocks a green, brown or brown/black colour, and a slimy texture, but that produce barely any material when scraped with a fingernail (< 0.5 mm thick).

Thin films aren't recorded in this assessment.

Sludge

Sludge is the name given for a slimy/sludgy coating of diatoms that easily falls apart when touched (distinguishing it from mats). It is light to dark brown-coloured.

Sludge isn't recorded in this assessment.

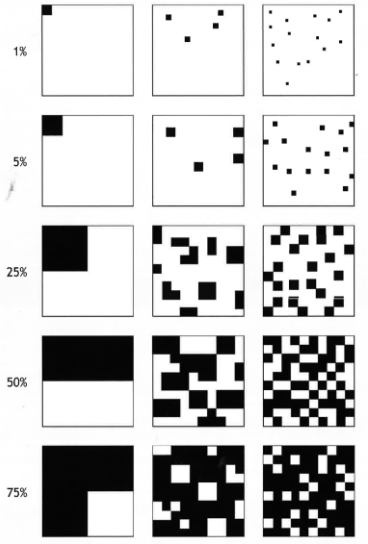


Estimating percent cover

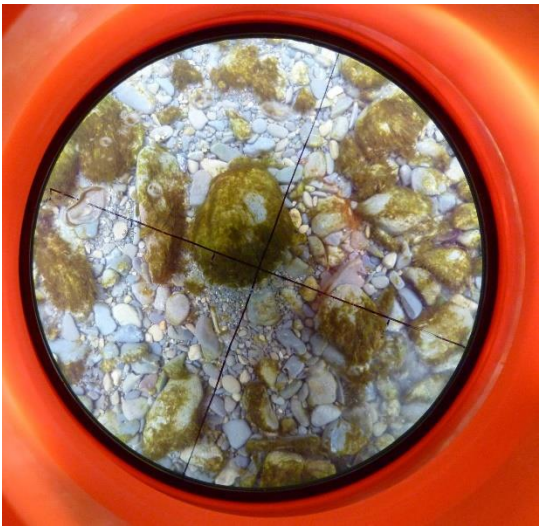
Estimate the percent cover of filamentous algae, mats, and the two type of nuisance mat algae (*Microcoleus* and didymo), to the nearest 5% (or to the nearest 1% if cover is less than 5%). Also record the percent cover of moss, if present.

The following examples show percent cover in a bathyscope viewing area. The “black disc underwater viewer” that comes with SHMAK gives a similar viewing area. If you are using the stone method, your cover estimates will be from individual rocks rather than viewing areas of the stream bed.

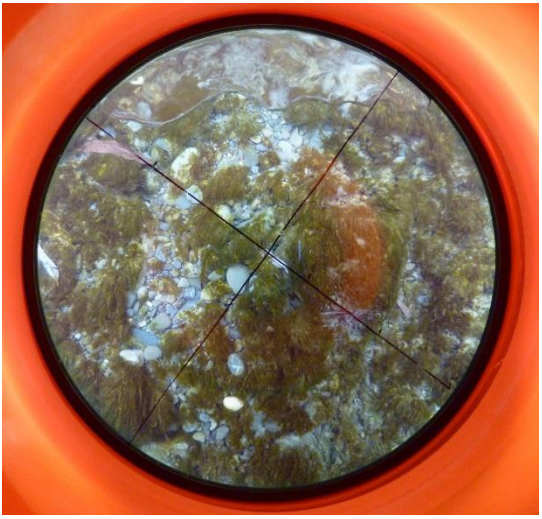
The percentage cover of thin film or sludge is not recorded for the periphyton assessment but is shown for comparison.



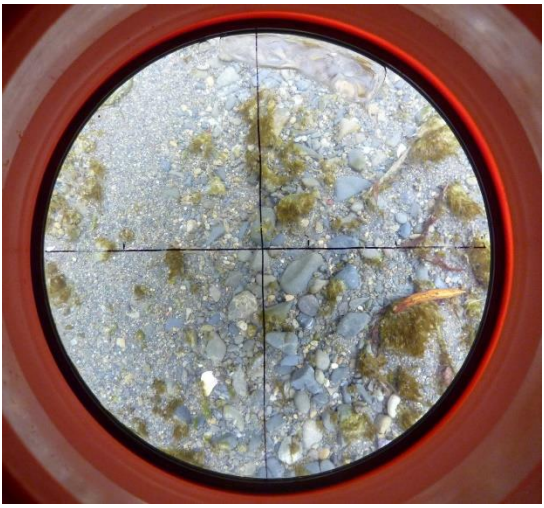
A visual guide for estimating percent cover. The black squares represent the periphyton, while the white area is the uncovered area of the stream bed or a stone.



60% Filaments

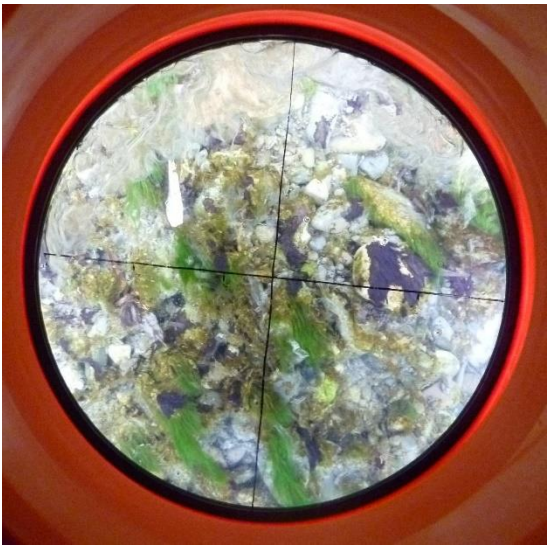


35% Filaments
5% Thin film



10% Filaments

25% Filaments
30% Thin film



35% Filaments
15% *Microcoleus*
5% Thin film

10% Grass
5% Thin film
80% Sludge