

UKTAG – Biological Status Methods

Coastal & Transitional Waters – Intertidal Seagrasses

What do we use as an Indicator?

Seagrasses (flowering marine plants, marine angiosperms)

Why do we use marine angiosperms?

Seagrass beds provide habitats for fish, prawns and other invertebrates, provide seafloor stability and are found in the intertidal¹ and shallow sub-tidal² zones along the coast. Seagrass beds are sensitive to general physical disturbance such as dredging and boat traffic, which can destroy the beds and also increase the suspended sediment in coastal waters. Seagrass can also be sensitive to the secondary effects of elevated nutrients, if these cause overgrowth of macroalgae or shading by phytoplankton. This method works on the principle that physical disturbance and water quality changes can decrease the extent and density of seagrass beds and may also reduce the number of species found.

Sampling

This method only applies to intertidal seagrass beds. Sampling is carried out when seagrass beds are at their peak bloom period during the summer months. The area of the beds is calculated from either aerial photography or by walking around the beds with a GPS. Quadrats are used to measure shoot density (as % cover) within quadrats. The number of seagrass taxa³ in the bed is also recorded.



What do we measure?

We measure 3 things:

Taxonomic composition

This compares the number of observed species with the number of historically recorded species. In the UK we recognise the seagrasses *Zostera noltii*, *Zostera marina* & *Zostera angustifolia* (the latter is regarded as an intertidal version of *Z. marina* but treated as a separate taxon for WFD), plus widgeon grass *Ruppia*

spp. As *Ruppia spp* are very difficult to identify, we only identify *Ruppia* to genus level. This gives a total of 4 possible taxa.

Shoot density / % cover loss

This is the estimated percentage cover of seagrass in the survey area relative to the historic percentage cover of that site.

Spatial extent change

This is the percentage loss or gain of the total area of the seagrass beds in the waterbody.

A stressed waterbody would exhibit a decrease in seagrass bed size, shoot density and the number of species. This decline allows space for other more tolerant species (such as opportunistic macroalgae) to grow. Opportunistic macroalgae can then dominate the area leading to the die-back of the seagrass bed. An undisturbed seagrass bed will be healthy & dense with no loss of historic indicator species. Beds should maintain their size or grow, though we must take natural variation into account. The changes in these measurements from a reference year are recorded. For baseline data no rolling mean can be calculated.



How do we decide the Ecological Quality Status?

For the above 3 measures figures were calculated to determine what these would be for undisturbed waters. The observed results are then compared with these figures to calculate the Ecological Quality Ratio (EQR). EQR values close to one indicate angiosperm communities are close to their natural state; those near to zero indicate a high level of pollution or disturbance. To decide the Ecological Quality Status the three measures are combined and the range from one to zero divided into the five bands required by the Water Framework Directive (see the table below):

Biological Status Boundary Values

Status	EQR Values
High	0.80
Good	0.60
Moderate	0.40
Poor	0.20
Bad	0

For more details see the [UKTAG Intertidal Seagrass Tool Method Statement](#)