



Institute of Fisheries Management

Fisheries Management During the Coronavirus Pandemic

In response to the many concerns expressed by fisheries managers about the viability of their businesses and the welfare of their fish stocks as a result of restrictions caused by the Coronavirus COVID-19 outbreak, the Institute of Fisheries Management (IFM) is offering some important advice for fisheries that have closed their doors during the pandemic

Many freshwater fisheries had, quite rightly, already decided to close their doors to anglers to reduce the spread of the virus before the tighter restrictions were put in place. This could lead to some difficulties for the fish in those fisheries, some of which rely on bait from anglers as their main source of nutrition, and also as spring is the time of year most associated with mortalities in still waters.

It is our understanding that caring for the fish in lakes comes under the government guidance for looking after livestock (<https://www.gov.uk/guidance/coronavirus-covid-19-advice-for-people-with-animals#horses-livestock-and-other-animals>). However, you should combine the visit to the lake with your daily exercise, do not make additional trips.

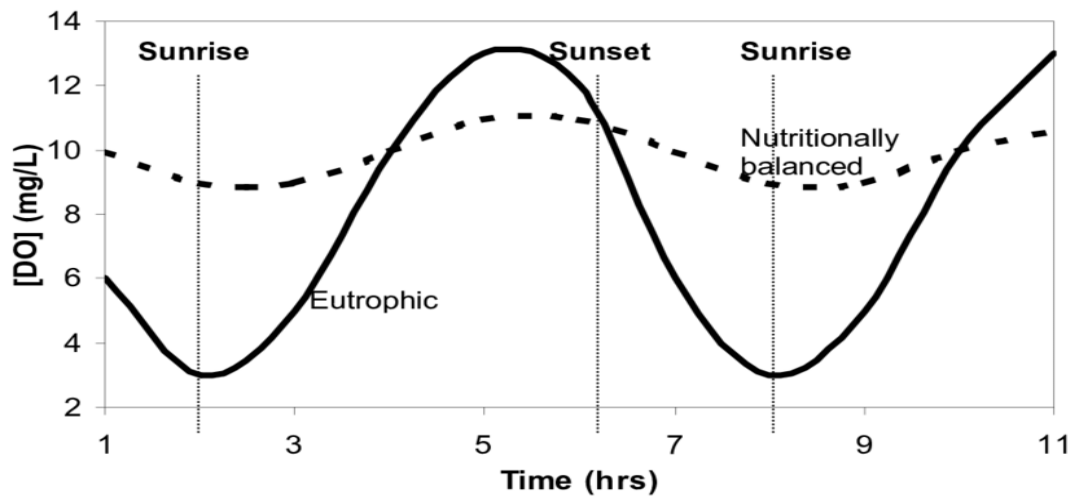
There are a few key factors you should be monitoring and considering when visiting your water

- Water quality
- Algae and weed growth
- Health of the fish
- Supplementary feeding

Water quality is of the upmost importance at any time of the year and you should be checking several parameters on a daily and weekly basis.

The most important parameter to keep an eye on is dissolved oxygen (DO). This is easily checked with the use of a DO meter, with records kept to allow you to spot trends in the future.

The best time to check levels is first thing in the morning, due to the diurnal fluctuation caused by algae and plants with lowest levels recorded at dawn. If you can, given the restrictions on movement, try and get to the fishery as early as possible in the morning to measure DO.



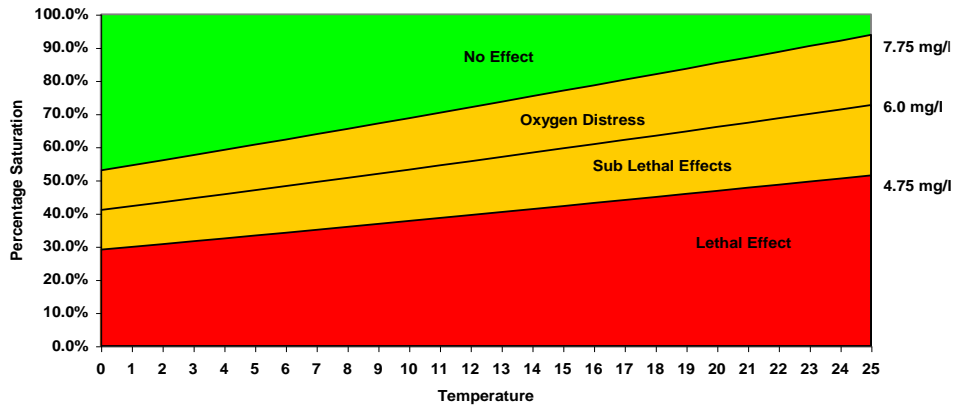
A graph to show the diurnal fluctuation of DO levels over a 24-hour period. A eutrophic lake is one that is nutrient rich and is likely to have excessive weed growth and potentially algae blooms



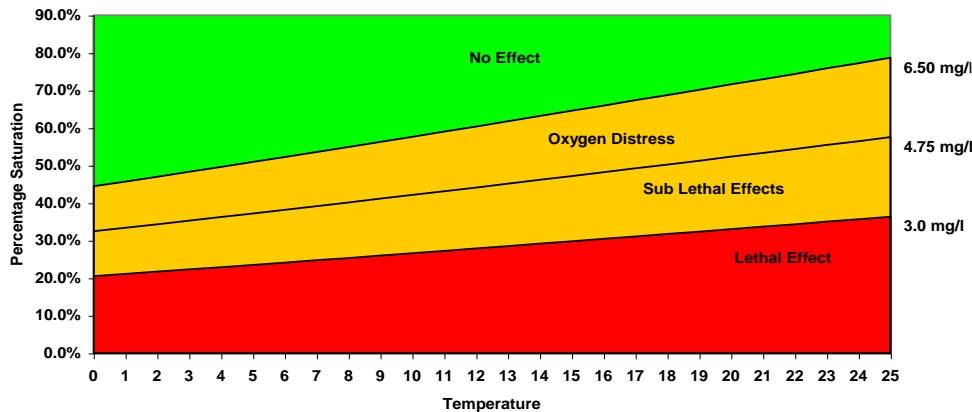
Dissolved Oxygen Meter

As the weather warms up you may need to consider the use of artificial aeration to maintain suitable DO levels, this is particularly important if you have elevated stocking levels. Aim to keep levels above 6mg/l

Dissolved Oxygen Effects - Salmonids - Cold Water Species



Dissolved Oxygen Effects - Coarse Fish - Warm Water Species



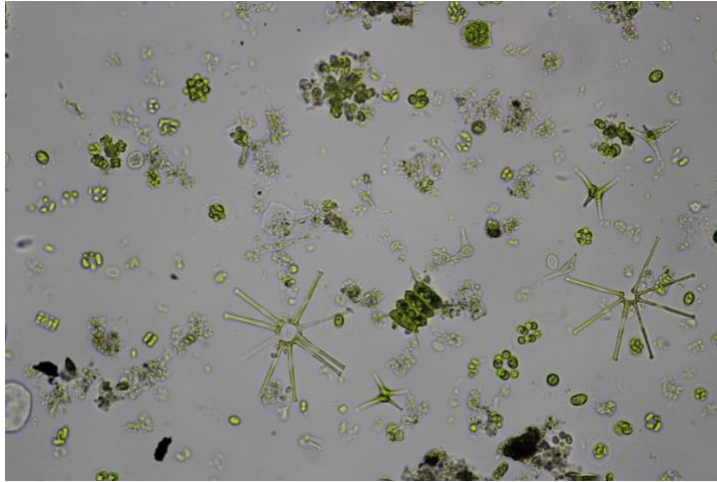
These charts illustrate the oxygen requirements of salmonid and coarse fish. Please note that there is no definite lower limit because DO requirements and tolerance vary by species, temperature and time of day. There is also some evidence that fish can acclimatise to low DO. It is however widely accepted that concentrations below 5 mg/l may adversely affect function and survival of biological communities, and below 3 mg/l can lead to the death of most fish species

Source – Environment Agency

You should also be recording ammonia and nitrite levels on a weekly basis at this time of year, especially if you are considering supplementary feeding. Both of these parameters are incredibly toxic to fish and can cause damage to the gills and internal systems of fish. These can be tested using simple colorimetric testing kits that you would use for a fish tank. Aim to keep levels as close to zero as possible and stop feeding at the first sign of increasing levels.

We recommend the NT labs multi parameter test kits for testing water quality (<https://www.ntlabs.co.uk/browse-products/indoor/aquarium-lab/aquarium-lab-multi-test/>)

Oxygen levels are intrinsically linked to the biomass of fish, and other aerobic aquatic life, within the water along with the amount of algae and macrophyte (weed) growth. As days become longer, sunnier and warmer (hopefully) we will see plants start to grow and an increased risk of algae blooms. This can cause DO levels to rise to levels well in excess of 100 and even 200%, which in turn can create problems.



A water sample showing multiple algae species

The important thing to keep an eye on is the levels of algae as a significant crash can cause DO levels to plummet which makes a fish kill likely. Heavy blooms can also starve other plants of light which compounds the DO problem.

Whilst it is difficult to cut and remove aquatic plants on your own, as it can be back breaking work, it is easy enough to apply pond dyes to try and suppress algae and plant growth. Whilst movement restrictions are in place this may be the best management action to take if you do suffer from algae and submerged aquatic weed. However, it needs to be in as soon as possible if it is to have a positive effect.

Spring is always a difficult time for fish and visiting your water first thing in the morning will also allow you to keep an eye out for abnormal behaviour, lethargic fish and fish that are gathered on the surface, in the margins or gasping at the surface. If you see any fish that are gasping on the surface, or that look generally unwell, put some artificial aeration or pumps on to elevate DO levels.

If the fish are showing any signs of disease you must report it to the EA or NRW immediately.

A poster from the Environment Agency. The left side is a yellow vertical bar with the Environment Agency logo at the top. Below the logo, the text reads: "Have you seen fish in distress?", "Report it on our incident hotline 0800 807 060", and "#savewater respect nature". The right side of the poster is a photograph of several fish, likely carp, gathered in a pond with reeds and lily pads.

From an essential animal welfare perspective and to prevent mortalities, it is important that you take steps to safeguard the health of your stocks. In the majority of fisheries the fish will be fine, as there will be plenty of natural food for the fish, however there are circumstances where this might not be the case.

- Where new fish have recently been introduced.
- Where the stock density is higher than would naturally occur.
- Where angling activity and baiting is particularly high in normal circumstances.

As waters warm up following the winter, fish will become more active which in turn increases their demand for food. In normal circumstances fisheries benefit from a daily input of bait from anglers which supplements whatever natural food is available. However, given the current closures of waters it is important that fishery managers consider the implications of the loss of anglers' baits, especially in waters where there is limited natural food or high stock densities and consider providing supplementary feed to make up the shortfall.

If your fishery has the circumstances listed above, The Institute recommends that you should;

- Begin feeding your fish sparingly once the water temperature is consistently 8°C and above.
- Only feed a diet designed specifically for fish and from a reputable company. For example, Aller Aqua, Skrettings, Coppens and Le Gouessant all produce excellent dedicated coarse fish diets.
- Feed at around 25-30kg per acre per week initially, dependent on stock levels and water temperatures.
- Use a pellet of 4mm or larger in size.
- Feed fish in the morning and in a dedicated area each day (try to make sure the area is free of weed). This allows you to assess how active the fish are and the demand for food. If the food isn't being eaten, stop feeding.
- Monitor water quality regularly, particularly dissolved oxygen, so that you can react to adverse conditions or a decline in available DO quickly. Also monitor ammonia and nitrite. Cease feeding at the first sign that either of these parameters is increasing (see guidance above)

Very few fisheries know the true biomass of their waters, hence the reason we have provided a feed ratio per acre. This is a maintenance ration and not one that is going to illicit much growth as we are well aware that the majority of fisheries are bringing in little, if any money. In normal circumstances, and if you know the biomass in the lake, you could be feeding up to 1%- 2% of bodyweight per day once the water warms up (and without additional anglers bait). This of course requires considerable financial input and time, both of which are in short supply at the moment.

There is a greater risk from over-feeding than under-feeding so we would recommend that fisheries managers are very cautious with any feeding regime.

If you have any questions relating to fishery management it is always a good idea to speak to your local EA or NRW fishery officer. If it is just a general question of interest you could post it on the IFM Facebook page.

Environment Agency incident line: **0800 807060**

Natural Resources Wales Incident hotline: **0300 065 3000**

Fish Health Inspectorate contact Telephone: **01305 206700**

IMPORTANT REMINDER - if essential fisheries management work needs to be undertaken to ensure the welfare of fish, it should only be done alone or, if this is not possible for safety reasons, the 2m distancing rule must apply.