



Windermere, Ambleside and District Angling Association Ltd

Aeration and Water Quality Management

July 2022

Nick Butterfield

Fishery Manager

Background

WADAA is a large club based in the Lake District. It manages 16 venues (coarse and game) for around 1500 members. Most waters are also available to day ticket anglers

On 29th July 2019, one of the game venues suffered a major overnight fish kill. This was a devastating event not only financially, but also for our reputation and standing as a professional organization.

In the weeks that followed, it became very clear that all the warning signs were present, but our lack of knowledge meant they were missed. The management team made the decision to significantly improve its knowledge and proactive management in order to reduce these risks for future – especially considering the warming climate.

Immediate steps were made to purchase some water pumping equipment, to be deployed in critical conditions. These were of very limited value, but have been used on a couple of occasions.



However, the real effort was put into trying to prevent getting to this stage;

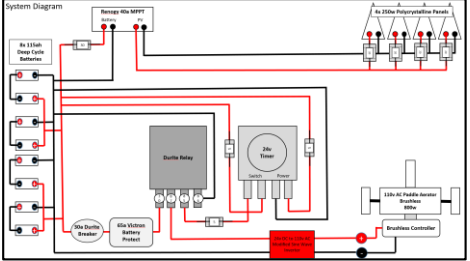
- Understanding the critical parameters
- Making use of pro-active interventions
- Deploying a wide variety of overall environmental improvements and mitigations

Water Quality Management and Aeration

The club embarked on a 2 pronged attack, as well as increasing its overall understanding. Suitable aeration units were sourced for the venues deemed most critical. Power availability is a key consideration and many of the club's venues have no mains power source. After trying 'off-the-shelf' solar solutions and being unhappy with the results, the club engineered its own. These set-ups charge a bank of batteries during daylight hours, allowing the aerators to run overnight.



The engineered solution is not straight forwards and the perfecting of these has been a steep learning curve!



On venues with mains power, aeration is much simpler. The club has used a number of different solutions, including some very large water circulators and air diffusers.

The club also undertook a number of other measures, such as the addition of barley straw and blue dye to control algae, controlled marginal planting, extensive use of floating islands and very careful management of stocking densities. At the same time, taking weekly water measurements (DO and temperature) on bailiff patrols. This measurement regime however was unsatisfactory; it takes up a huge amount of time, are only single measurements which miss out most of the week and are not accurate in terms of repeatability – a better solution was needed!!

The club teamed up with Manchester University and trialed a 3G connected monitor using a probe which measures DO and temperature (this monitor, with different probes, was already being used in the water treatment industry)

Clam RTU

... remote monitoring of the environment

SALAMANDER GROUP

KEY FEATURES

- Low power operation allows remote deployment for extended periods
- Fully waterproof and robust enclosure designed to IP68 standard
- Connects to many types of low power sensors used in the water environmental sector
- Unique in-built relay for activating external devices from sensor reading trigger levels
- Bi-directional 4G cellular communications for remote configuration, data upload and alarming
- Bluetooth mobile app for local set up, control and data collection
- Powerful Clamnet Portal data management and visualisation
- Being used by charitable aid organisations in many parts of the world to help ensure drinking water is safe

CLAMNET

The Clam RTU is part of the Clamnet system of sensors, telemetered data loggers, mobile app and web data portal. The Clam RTU can be used with a wide range of sensors to monitor the water environment. From rainfall, upland and lowland water courses, lakes and reservoirs to drinking water networks, many parameters defining water quality can be measured, stored and uploaded to the cloud based Clamnet data portal.

CLAM RTU

The Clam is a battery powered data logger and telemetry unit which has been designed to operate in fairly challenging conditions for long periods. Through continuous development the device can power a range of our own and third-party sensors, for long periods from the internal batteries. Using RS485 communications a single Clam can collect data from multiple sensors at a single location.

Alarm levels for each parameter can be stored on the Clam which trigger email warnings when these are breached. Uniquely, the Clam has an in-built relay which can be used to activate external devices, such as pumps, valves, aerators.

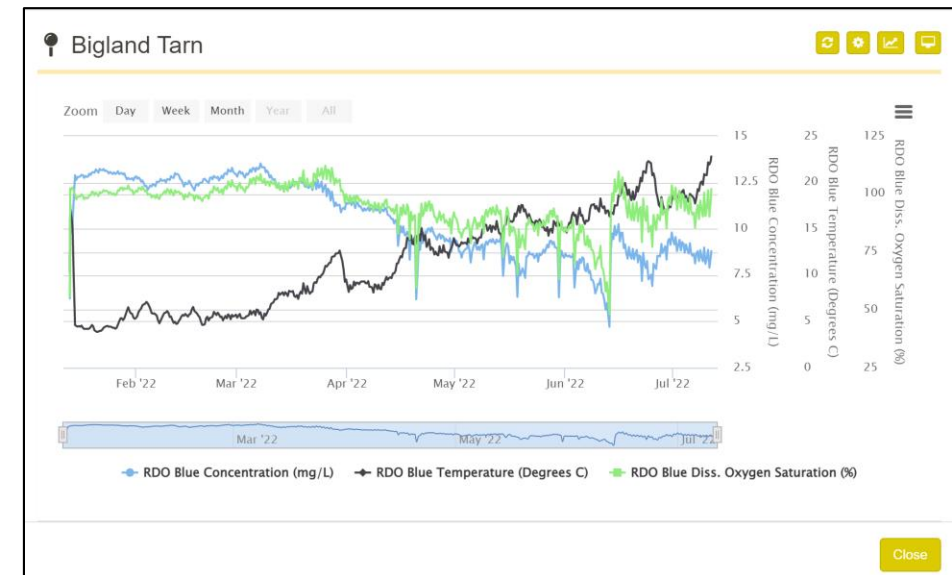
The Clamnet App is now available on Google Playstore and Apple Appstore and has been enhanced for greater control of the Clam via a bluetooth connection.

CLAMNET PORTAL

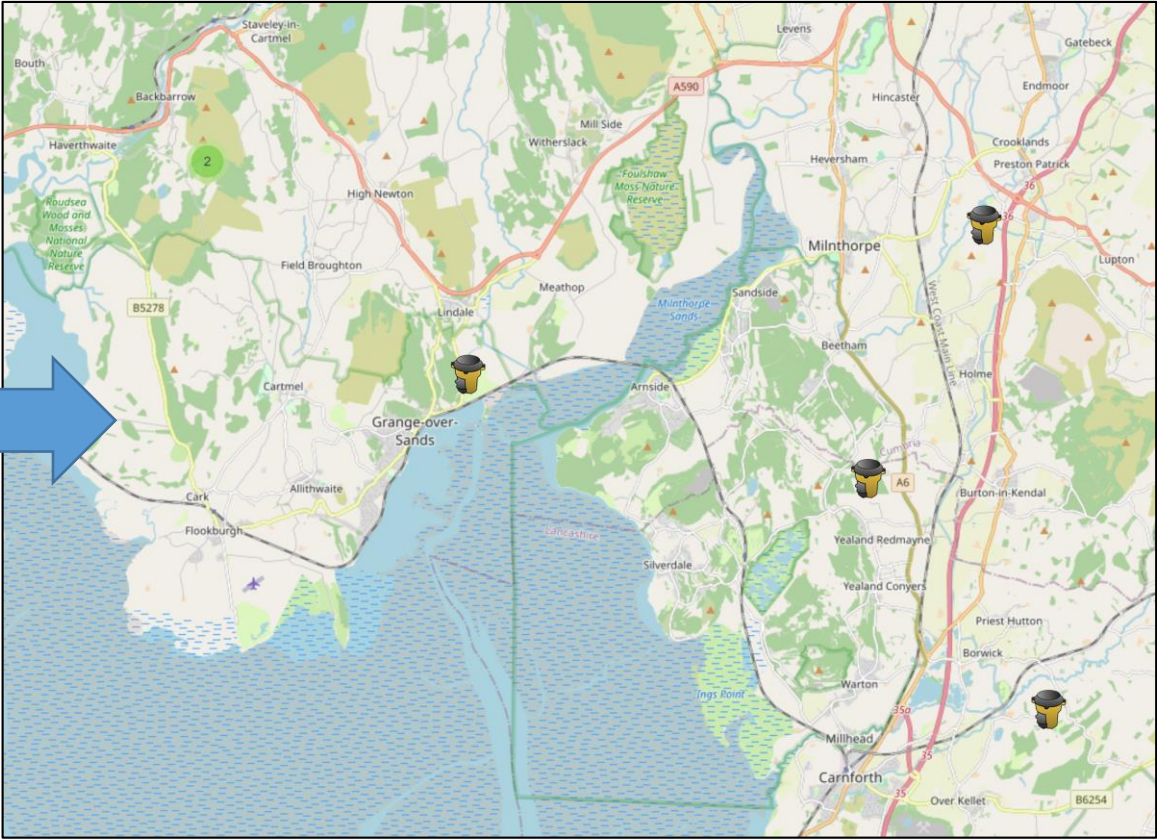
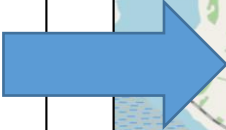
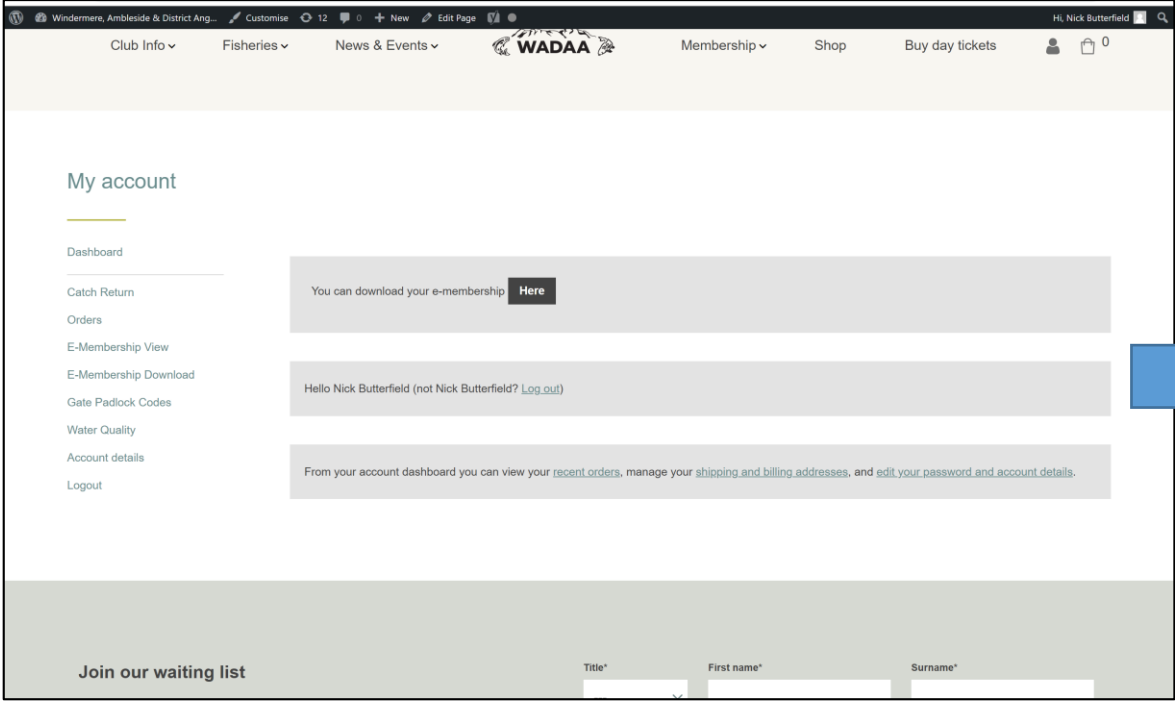
Data from the Clam is stored and viewed on the very secure Clamnet Portal. With flexible device management and visualisation tools the portal can manage large Clam fleets. Data can also be exported as CSV files or via our API to import into SCADA or other corporate systems.

Contact: info@salamander-group.co.uk

Anchored into position, these units provide constant data measurement, uploading the information to a portal every 4 hours. This gives a complete picture of what is happening in the water. Additionally, the portal is pre-set with critical control limits and triggers notifications when reading fall outside of these (more of this later).

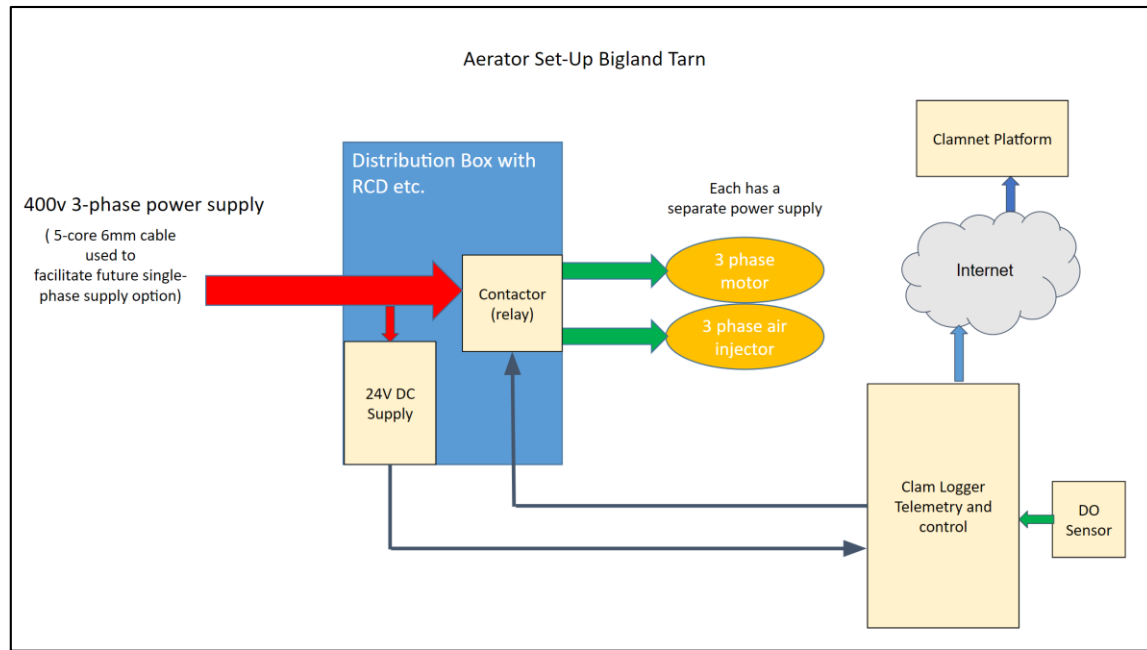


All of the venues with monitors are accessed from a very simple portal and members have access to this data from their own 'MyWADAA' login on the website. The club has undertaken a significant programme of 'member awareness' throughout this period too.

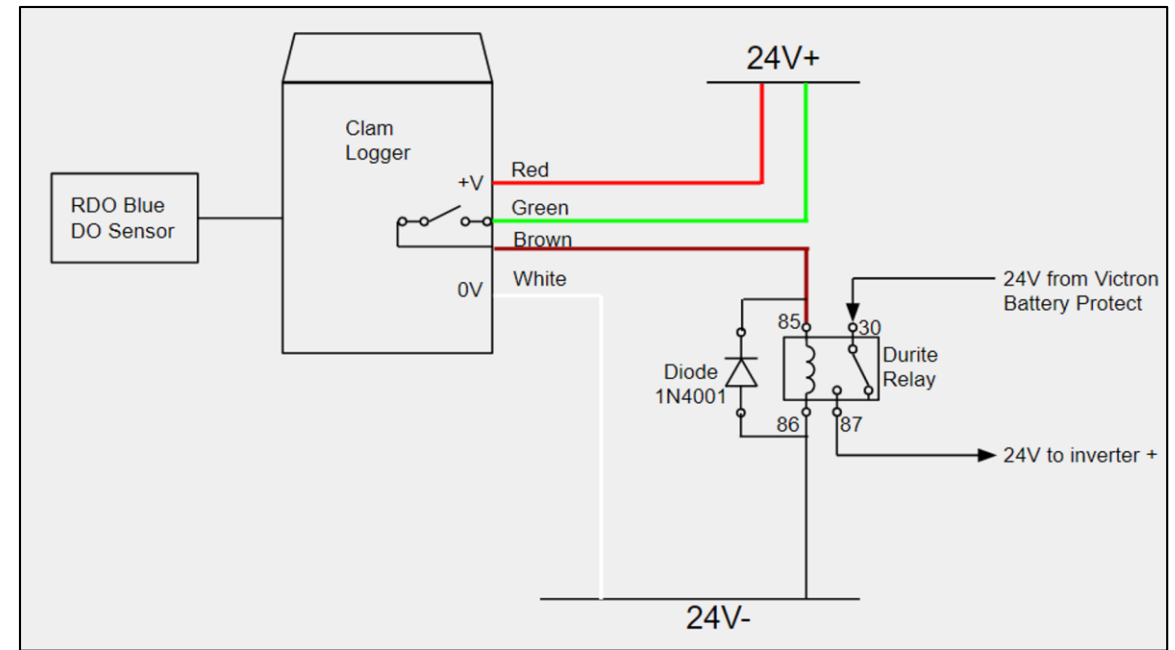


Getting members interested and connected to this is really important in raising understanding, particularly in relationship to stocking and stocking densities. It is noticeable now that members self-elect not to fish when conditions are critical.

Both solar and mains powered aeration have their limitations. Solar has a finite power and mains electricity is increasingly expensive. This creates the risk that aerators wouldn't be running if there was a critical event. To mitigate all of these issues, the club have again worked with Manchester University and the water monitor supplier, to link the aerator and water quality monitors. In doing so, the aerators are automatically triggered when measurements fall outside of pre-set parameters. This not only provides a level of 'foolproofing', it also means that expensive electricity or finite battery power are only used when needed.

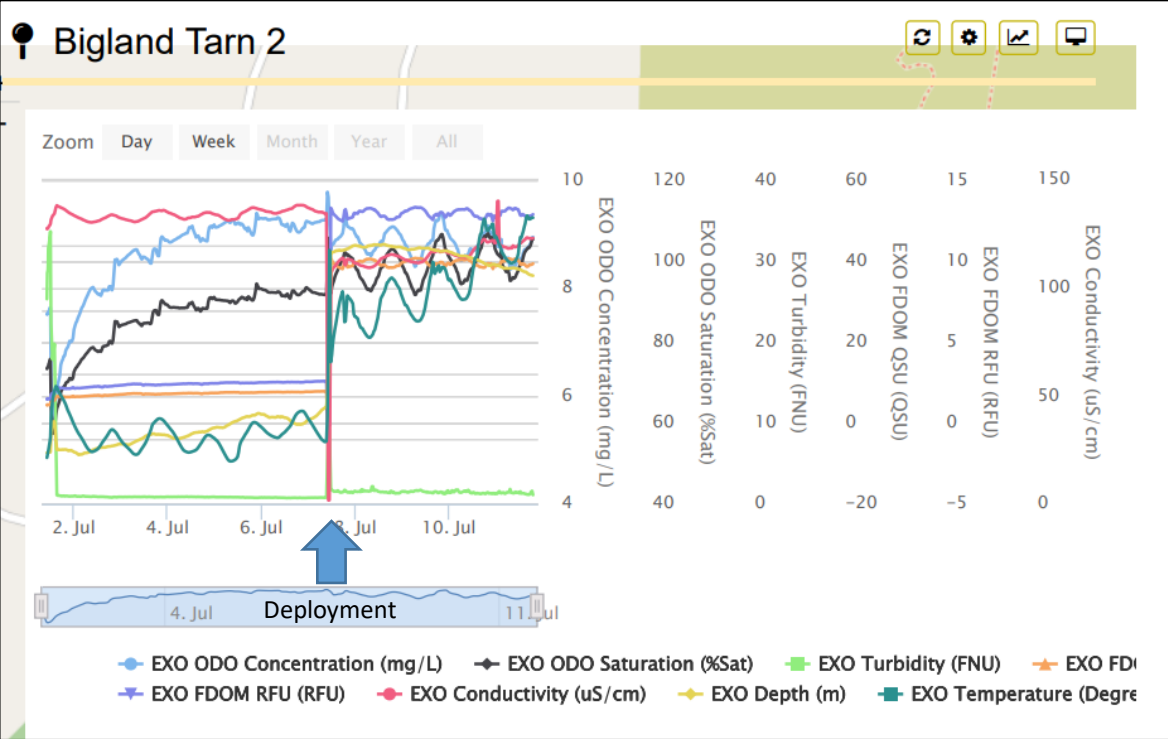


Mains Connection

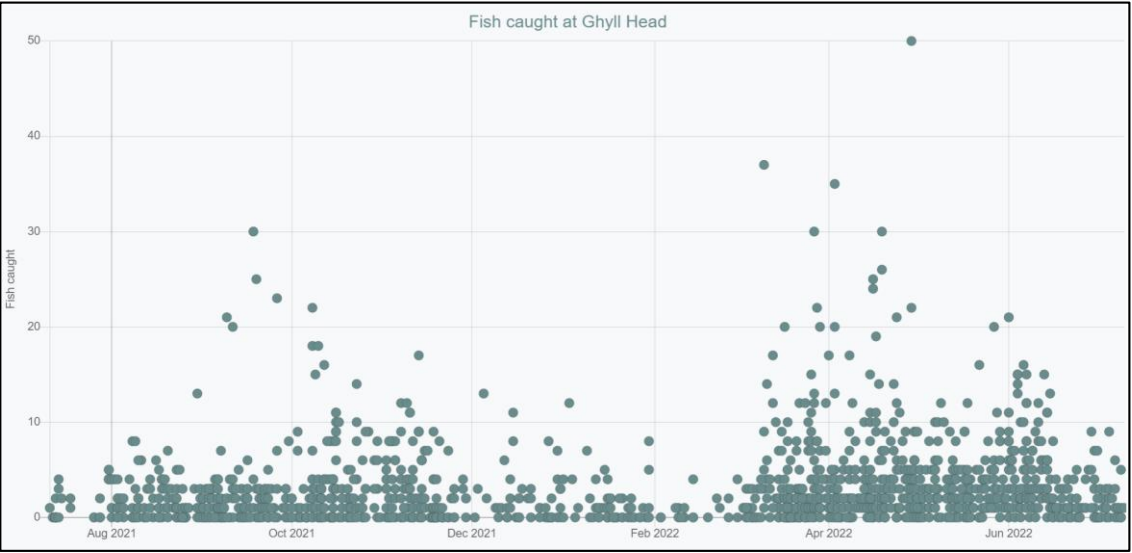


Solar (battery) Connection

Within the last 2 weeks, continuing the partnership with Manchester University, the club has installed a much more sophisticated monitor into one of the game venues. This is aimed at understanding more about the wider conditions and water chemistry.



The club also compiles electronic catch returns from all its venues



Over the course of the next 6 months, PHD students at the university will analyse the catch return data and water quality measurements, to help us further understand the key impactors on catch rates.

Though this has taken a lot of effort to set up, the quality of angling and rod averages have improved significantly – often with reduced stocking densities. The club has not had a repeat of the events of 2019 and last year managed to keep trout alive (just about!!) in water temperatures over 26 degrees. Throughout this journey, the club has also worked closely with the Angling Trust and the Environment Agency to tap into their expertise.