

## Fact Sheet

# Using your pump to create oxygen refuges for fish

### Are there sick fish near your property?

**Have you observed stressed fish gulping at the surface or swimming slowly in the vicinity of your property?** These fish are likely experiencing hypoxia due to the current low flows, high temperatures and algal blooms. Hypoxia is when dissolved oxygen (DO) levels in the water are so low that fish are struggling to “breathe”. At low DO levels fish can often be observed flapping their gill covers and at more severe levels will start gulping at the surface. Fish that are exposed to these conditions repeatedly over several days may eventually become in such poor condition that they die as a result.

### Can you use your pump to help?

**If you have observed this behaviour, or are concerned that fish may be in the process of dying, you may be wondering whether you can use your pump to oxygenate the water and help save fish from hypoxia.**

**The shooting of a jet of water onto the surface of the river can assist in improving DO levels and may provide some relief to fish in extreme hypoxic conditions.** However, this is largely an inefficient way to oxygenate water and therefore the benefits are only likely to extend to the very surface layer and within tens of metres of the jet of water. Any improvements in DO levels will also only last as long as the pump is running. The most beneficial time to undertake this activity would be in the early hours of the morning (e.g. between midnight and 10 am). This is when algae are consuming and depleting surface oxygen levels. At other times of the day you will probably be making little difference to dissolved oxygen levels because it is likely that surface DO levels will be sufficient (due to algae producing oxygen) to support surface ventilation by fish.

### Are there any risks to the fish?

**Under certain circumstances there is a risk that by doing this you may make the problem worse for fish. This is why you will need to assess the suitability of your pump and follow the operating conditions outlined below carefully.**

Care must be taken to elevate the intake (preferable into the top 1-2 m of water) to minimise the risk of sucking or stirring up hypoxic deeper waters or nutrient rich sediments that could further reduce surface water oxygen levels where fish are present. In some instances hypoxic water or nutrient rich sediments may be evident as discoloured (black, brown, green) or stagnant, sulphur smelling water. However, in many instances it may not be possible to

determine the oxygen levels of the water without appropriate monitoring equipment. Therefore it is best to be conservative and avoid deeper water.

Because fish will likely accumulate around the water jet, this jet must be sufficient distance away from the pump intake to reduce the likelihood that fish may be sucked into the pump.

### **So might your pump be suitable?**

**Not all pumps will be suitable for this purpose. Other pumps may be, but may require some modifications so as to minimise the risk of doing even more environmental harm.**

**Your pump may be suitable if:**

- You are able to divert all the water you pump back into the river;
- The intake can be raised so that it is no deeper than 1-2 metres below the surface
- The water jet can be placed so that it is spraying water onto the surface (not below) and is situated at least 10-20m away from the intake point
- You have the capacity to run the pump between the critical period of 12pm and 10am

**If you cannot meet the above criteria it is recommended that you do not undertake this activity as you may cause further harm.**

### **What should I do once I'm pumping?**

**It is important to monitor your system from time to time to ensure that there is no indication of adverse impacts.** If you notice discoloured water, a stagnant smell, or an apparent increase in the level of stressed fish, or an increased rate of fish deaths, you should cease the pumping immediately.

### **Your obligations**

**The Natural Resources Access Regulator (NRAR) reminds all those participating in this program of their obligations under the law not to take water in excess of allocation or in contravention of licence conditions or any other relevant take restrictions. As always, NRAR officers will be on the ground across NSW undertaking compliance monitoring activities.**

### **What arrangements first need to be made?**

**If you wish to use your pump to oxygenate the water in accordance with this fact sheet, then you will need to:**

- 1. Contact WaterNSW on 1300662077 or via email on [customer.helpdesk@waternsw.com.au](mailto:customer.helpdesk@waternsw.com.au).**
- 2. You will be required to provide your License and Works Approval details together with an approximate pumping time and estimated volume likely to be extracted.**
- 3. Prior to pumping, you will need to provide photographic evidence of your START meter reading to WaterNSW via the above email address.**

4. **After you have returned the water, you will be required to provide further photographic evidence of your END meter reading to WaterNSW via the above email address.**

**Please note that at all times you are required to comply with the terms and conditions of your License and Works Approval. If you have any questions please contact WaterNSW as set out above.** For any inquiries relating to reducing impacts on native fish – please contact DPI Fisheries on (02) 4424 7499 or email [information-advisory@dpi.nsw.gov.au](mailto:information-advisory@dpi.nsw.gov.au)

---

Department of Industry, 2019. You may copy, distribute and otherwise freely deal with this publication for any purpose, provided that you attribute the NSW Department of Primary Industries as the owner.

**Disclaimer:** The information contained in this publication is based on knowledge and understanding at the time of writing (February 2019). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of the Department of Primary Industries or the user's independent adviser.