



FOR IMMEDIATE RELEASE 6/11/20

**REVIVE LAKE CATHIE WATER TESTING RESULTS RING ALARM BELLS FOR
THE FUTURE OF THE LAKE CATHIE/LAKE INNES ESTUARINE SYSTEM**

Revive Lake Cathie commenced preliminary water sampling throughout the Lake Cathie/Lake Innes Estuarine System at the launch of the Epic Quest to Revive Lake Cathie on 26/9/20. Preliminary water sampling was undertaken to create estuary baselines and to formulate trend analysis.

On 10th & 11th October 2020, further testing was completed by Revive Lake Cathie's NSW Waterwatch Team to qualify 243 water samples. Revive Lake Cathie subsequently reported a fish kill to the Department of Primary Industries – Fisheries on 12-10-20. Testing results support environmental degradation underway in the Lake Cathie/Lake Innes Estuarine System and the need for urgent action.

Revive Lake Cathie's Marine Biologist Dr Deb Geronimi qualified preliminary water sampling, raising alarm bells for Revive Lake Cathie Members, the General Public and the future of our lake. Dr Geronimi's results indicate the overall the lake's health is extremely poor and has extremely poor water quality.

"It is an ecological disaster that could have been prevented by opening the lake before the drought. The drought in 2019 caused the water levels to drop, it became hypersaline and the sediments were exposed to the air. This exposure to the air activated the acid sulphate sediments. Once it rained these acid sulphate sediments released sulphuric acid into the water, dropping the pH. The Iron also precipitated out of the sediments as the sulphates were released. The rain events diluted the sea water causing it to become freshwater which shocked all of the marine organisms when the lake was closed and a massive die off of aquatic life occurred" Dr Geronimi has advised. "In conclusion, this constant opening and closing of the lake is not good for the ecology and the organisms that live within and surrounding the lake system".

"The Community of the Port Macquarie-Hastings needs to be informed of the potential loss of this beautiful natural resource. If action is not expedited the loss of lake ecosystems, habitat and marine life, may not be recoverable "said Revive Lake Cathie Committee Member Kate Aston

"Revive Lake Cathie calls for immediate implementation of measures to halt the national environmental catastrophe underway in the Lake Cathie/Lake Innes Estuarine System" said Revive Lake Cathie President Danielle Maltman.



Testing results are available thanks to the Community Volunteers of Revive Lake Cathie who have taken action in undertaking water testing as the “Voice of the Lake”.

Excerpts from Dr Deb Geronimi’s –

Summary of results for Lake Cathie / Lake Innes water testing for 10th October 2020.

Overall, the lake’s health is extremely poor and has extremely poor water quality. Since last month ammonia levels have risen, fish deaths have been reported and salinity levels are increasing due to the closure of the lake. Sulphates are still a huge problem in the lake due to acid sulphate release. Endangered Stingray’s and marine life currently trapped in our closed lake will not survive under the current conditions.

The whole lake system is in need of dredging as there is far too much sand in the lake system. The constant opening and closing of the lake is not good for the ecology and the organisms that live within and surrounding the lake system.

Salinity

Salinity levels are rising due to the lake being closed from the ocean. Electrical conductivity is usually high where there are large amounts of salts dissolved in the water. Due to the fact that the lake has the same salinity as the sea it should have a pH of approximately 8.2, however it has a much lower pH of 7 in Lake Cathie and pH 8 at Cowarra Creek. This is due to the activation of the acid sulphate sediments which is causing the pH to drop. Lake Innes however has a pH ranging from pH 8 – 9.

Salinity results - Extremely poor, very few marine life will survive if the salinity continues to rise.

Alkalinity

The alkalinity of Lake Cathie Lagoon was low throughout the system with the alkalinity of Lake Innes being extremely low. Therefore, the buffering capacity of the Lake Cathie Lagoon and Cowarra Creek are at normal levels, but the buffering capacity of Lake Innes is very poor which means it is highly susceptible to acid.

Alkalinity results - Extremely poor and will get worse with the lake being closed from the ocean.



Acid sulphate sediments

Sulphate levels were extremely high and over range at all sites. Lower levels were present in Lake Innes. High levels of sulphate is due to the activation of acid sulphate sediments releasing sulphuric acid into the water. These levels have been implicated in a number of skin complaints, particularly eczema. These levels are also considered to be a contributor to red spot disease evidenced in the Lake's marine life.

Iron, both Ferrous (Fe^{2+}) and Ferric Iron (Fe^{3+}) were detected at all sites, with more Ferric than Ferrous Iron. The Iron is extremely visible throughout the lake as a red / brown precipitate on the surface of the sediments. Aluminium was detectable in Lake Cathie lagoon and Cowarra creek but not Lake Innes. Aluminium is released from sediments when acid sulphate sediments have been activated.

Sulfate, Iron, Aluminium results - Extremely poor

Oxygen

Oxygen levels varied in different parts of the lake. Oxygen levels were very low at Lake Cathie lagoon (69% saturation). At this site dead fish were found in the water and possibly died due to lack of oxygen. Dead fish will cause a further drop in oxygen levels due to BOD (Biological Oxygen Demand). The low oxygen levels in Lake Innes are a worry with a range of 8 to 74 % saturation. Oxygen levels are extremely low in some areas of the lake and very few fish can survive in these low levels. As the water temperature of the lake increases over summer a drop in oxygen concentration will occur and hence death of aquatic life. With the fish stocks falling to extremely low levels, we can expect to see a potential increase in mosquito activity, if salinity level's fall due to rainfall.

Oxygen results - Unhealthy - very few marine life will survive

Turbidity

Turbidity in Lake Cathie lagoon is from <10 to 20 NtU. Turbidity values are low throughout the Lake Cathie / Lake Innes system and hence indicate that there is not much phytoplankton in the



water which can be a problem as phytoplankton produce oxygen as a by-product of photosynthesis. Lack of photosynthetic organisms is not good for the lake as they are the start of the food chain and also provide oxygen to aquatic organisms. Without these photosynthetic organisms means less oxygen and food for aquatic species. Lake productivity is therefore poor and unable to sustain life.

Turbidity results - Unhealthy - very few marine life will survive

Nitrogen compounds

Ammonia was detected in most sites tested and dead fish were found in Lake Cathie Lagoon. The recent die-off of fish would cause a spike in ammonia levels. Ammonia levels were higher than the previous month. Nitrates were detected in the water at Lake Cathie and Cowarra Creek but not Lake Innes.

Nitrogen results - Unhealthy - very few marine life will survive

Phosphates

Phosphates levels were low in Lake Cathie, but much higher in Cowarra Creek. Lake Innes had detectable low levels of phosphates. Phosphates are usually washed in from surrounding land either from fertilisers, ash from fires and also from household chemicals.

Phosphate results - Unhealthy

Surfactants

Surfactants were present in Lake Cathie Lagoon, Cowarra Creek and Lake Innes. Surfactants are detergents and may be washed into the lake from the surrounding households.

Surfactant results -- Unhealthy - run off into the lake from surrounding households the contributor



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voice of the lake

Tannins

Tannin levels were extremely high in all areas tested. Tannins are released from decomposing vegetation and oils from Tea Trees washing into the lake – this causes the brown colouration of the water.

Tannin results - Extremely high

Dr Deb Geronimi

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For further information contact Revive Lake Cathie President Danielle Maltman 0410 499 209 or secretary@revivelakecathie.com.au