

# UPDATE ON WESTERN VICTORIAN EEL DEATHS INVESTIGATION

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## INTRODUCTION

Mass eel deaths have occurred in a number of Western Victorian lakes during the summer and early autumn seasons between October 2004 and January 2006. In particular, around 50,000 and 5000 eels died in Lake Modewarre and Lake Bolac respectively throughout that 15-month period – a time that was impacted heavily by an extended phase of dry weather.

EPA Victoria has been working with a number of other agencies, including commercial eelers, to fully investigate the possible cause of the deaths.

Data analysis to date suggests that the impact of drought conditions is the major reason for the eel deaths. However, there are other potential secondary factors that have not yet been ruled out, such as the effect of eel biology, toxic algae and turbidity.

The Eel Death Investigation Reference Group (EDIRG) was established in May 2006 to overview EPA's scientific investigation into the possible cause of the eel deaths.

The group includes representatives from the Department of Primary Industries, Deakin University, Department of Sustainability and Environment, Corangamite and Glenelg Hopkins catchment management authorities, Primary Industry Research Victoria, the commercial eel industry and Environment Victoria.

## WHAT WE'VE FOUND SO FAR

EPA has reviewed historical records to ascertain whether similar events have occurred in the past.

The review of the historic records shows little documented evidence of fish and eel deaths in the Western Victorian lakes, although there are numerous published references to periods of drought resulting in lake levels being very low and, in some instances, lakes drying out.

Anecdotal evidence indicates that many Western Victorian lakes have been nearly or completely dry during their history, including Lake Modewarre and Lake Bolac.

There is also a reference to mass deaths in the journal of George Augustus Robinson as he explored the areas in the early 1800s.

A report of the historical review will be finalised and released in December 2006.

The scientific investigation has examined drought-related impacts such as temperature, salinity, pH and turbidity (opaqueness due to suspended particles), and other factors including toxic algae, eel parasites, toxic gases, overpopulation and toxicity from heavy metals and synthetic organic chemicals.

Results of the EPA investigation point to drought-related impacts as being the most likely cause of the

deaths. The impacts of drought have significantly reduced inflows to the lakes and increased evaporation, causing increased salinity and pH levels, changes in turbidity and warmer water temperatures. Further monitoring is planned for this coming summer to better understand the drought-related impacts.

A report on the scientific results from the investigations will be published in December 2006.

### **MONITORING DURING SUMMER 2007**

As the most significant deaths occurred during the summer periods, a number of lakes will be monitored during the 2007 summer to understand the changing conditions in the lakes better. The monitoring program will include lakes Modewarre, Bolac, Colac and Tooliorook.

A number of water quality parameters will be measured continuously, including salinity, pH, dissolved oxygen and temperature. Water samples will be collected every three weeks for laboratory analysis of parameters such as suspended solids, turbidity, major ions, chemical composition and toxic algae.

### **CURRENT STATUS OF THE LAKES**

Water quality within the Western Victorian lakes has not improved since the time of the last fish and eel death events in early 2006. The salinity of Lake Modewarre is over one-half that of seawater and the alkalinity of the water is very high (pH is nearly 10). The salinity of Lake Bolac is currently just over one-third that of seawater and the pH is 8.6. The water quality conditions in both the lakes are poor and will deteriorate further if conditions remain dry. This will

continue to pose a threat to fish during the coming summer.

### **ARE THERE LIKELY TO BE FURTHER DEATH EVENTS THIS SUMMER?**

Given the lack of substantial winter and spring rainfall, EPA expects that further mass deaths of eels and fish are likely to occur during the coming summer period. While this is an outcome no-one wants to see occur, EPA is working to find enough information to reduce impacts as much as possible. Where possible, fish will be harvested from the lakes by commercial fishers.

EPA and other agencies will respond in the event of a significant fish or eel death incident. If an eel or fish death does occur, additional sampling of water, sediment and fish will be undertaken to assist in the investigation of the cause. If required, dead fish and eels will be cleaned up to prevent further degradation of the water quality in the lakes or surrounding land.

### **WILL THE LAKES RECOVER?**

The historic review indicates that many of the Western Victorian lakes have dried out previously yet recovered when rainfall returned to normal levels. The impacted lakes have been stocked with eels previously and can be stocked again in the future.

As the lakes are drying, it has been noted that seagrass is dominating as a result of increasing salinity. Additionally, it has been noted that birdlife on and around the lakes has increased. The increase in birdlife may be associated with reduction in water across the landscape as a result of drought or birds having easier access to fish as the lakes dry.



**Lake Modewarre in 2005 (above) and 2006 (below), showing the receding waters of the lake.**

## **HOW YOU CAN HELP**

The early reporting of eel or fish deaths will enable EPA officers to access the best data to help determine the cause. If you notice sick or dying eels or fish please contact the EPA South West Region office on 5226 4825

If possible, the following information will help the officer in the initial assessment of the event:

- Take note of what part of the lake or river is affected.
- Are the fish or eels in or out of the water, or both?
- Estimate how many fish and or eels are involved.
- Note the condition of the fish and or eels. In other words, if still alive are they gasping for air, if dead is there any noticeable marking or bleeding on the body?

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- Note water quality condition (for example, colour of water, turbidity, algal growth).
- Call EPA with the information on either 5226 4825 or the Pollution Watch Line on 9695 2777 (or 1800 444 004 for country callers).