# RIVER HEALTH IN NORTH-EAST VICTORIA AFTER THE 2003 BUSHFIRES

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## INTRODUCTION

Following a period of intense drought, bushfires in January to February 2003 burnt over one million hectares of north-east Victoria, the largest fires seen in over 60 years.

Fire plays an integral role in shaping the Australian landscape, yet we still understand little of its influence on the aquatic environment. To further our knowledge, the State Bushfire Recovery Task Force commissioned EPA Victoria to assess the effects of the 2003 bushfires on the health of our rivers and to monitor the recovery of river life.

Three studies are being conducted to:

- provide a broadscale snapshot of river health and river recovery following the fires
- look at changes in river life after bushfire ash and sediment are washed into streams
- assess post-fire changes in water quality and its effect on river health.

### Broadscale snapshot of river health

Many types of river were influenced by the bushfires. River health was assessed at 60 sites across a broad range of stream types in fire-affected areas. Of these, 47 had been sampled before the fires, enabling good comparison between river condition pre and post-fire.

Stream invertebrates (insects, snails and worms), commonly used to indicate the health of aquatic ecosystems, were assessed and river health ratings were developed for sites based on environment quality objectives set in the *State Environment Protection Policy (Waters of Victoria)*.

The severity of impacts on river health was quite varied after the bushfires. Only one-third of rivers affected by fire showed a decline in health, highlighting the resilience of these streams to natural disturbance. The study showed river health was not so much influenced by the severity of the fire but by whether heavy rains followed, washing large amounts of ash and sediment into the river, and whether the fire left unburnt areas that allowed river life to take refuge and recolonise burnt areas afterwards.

Poor river health was particularly evident at sites that had experienced sediment slugs following rain, with 70 per cent showing a decline in condition.

A report describing the first year of this three-year study, *River health: a snapshot of the effects of the 2003 bushfires,* can be found on the EPA website:

**www.epa.vic.gov.au/water/threats/bushfires.asp**

**Bushfire sediment slugs and change in river life**

To look in greater depth at how sediment slugs affect river life, a detailed, three-year study is examining the health of two rivers in the Ovens catchment: the Buffalo River, which was affected by fire, and the King River, which was unaffected.

The study is focused on changes in stream invertebrate and algal communities before and after a small storm washed sediment into the Buffalo River. The storm was not severe, the surrounding catchment was not too severely burnt and only small amounts of sediment were washed into the river, particularly in comparison to other streams that received sediment slugs after the fires.

In the first year following the fires, it appears that drought has had a greater influence on these rivers than the effect of low-level sedimentation. While there has been a drop in the number and variety of stream insects following the bushfires, the change is small when compared to effects of severely reduced flows in the Buffalo River during summer 2003.

While these two rivers will be studied until spring 2005, a preliminary report of results to date, A quantitative study of bushfire impacts on the Buffalo and King rivers: first-year findings, can be found at: **www.epa.vic.gov.au/water/threats/bushfires.asp**

**Water quality and stream health following bushfires**

For the first year after the fires, assessments of water quality and stream invertebrates were made in five rivers severely affected by the fires: Snowy Creek and the Mitta Mitta, Kiewa (West Branch), Tambo and Snowy Rivers.

Large increases were clearly seen in suspended sediment and nutrients in the rivers during storm events after the fires. Stream invertebrates showed a broad range of response and recovery to these events. On the positive side, there was relatively quick recovery in Snowy Creek. At the other end of the scale, the Tambo River at Bindi, which was the most severely affected by sediment, showed no evidence of recovery by spring 2003 and seems to have continued to deteriorate.

Shortly, a report on this 12-month study, *An assessment of the condition of the aquatic macroinvertebrate fauna at five stream sites affected by the 2003 Victorian bushfires*, will be available at: **www.epa.vic.gov.au/water/threats/bushfires.asp** EPA will continue to monitor recovery in the Tambo River over the next year.

**Further information**

EPA's fire recovery program will run until mid-2006. We will continue to monitor the recovery of river health after the bushfires and make our findings available through the EPA website.

More information on the State's Bushfire Recovery Program can be found on the Department of Sustainability and Environment website at **www.dse.vic.gov.au**.