

Assessing changes to the Snowy River channel and vegetation 2010–19

Project description

In 2019, we used a drone to take photos from the air of the Snowy River channel. We compared these against photos collected by plane in 2010 and examined changes to the river channel and vegetation at five sites.

Study design

The Snowy River Environmental Flow Response Monitoring and Modelling project last collected photos from the air of monitoring sites in 2010. These photos were taken using a plane, the standard method at the time.

In spring 2018, we trialled using a drone (Figure 1) to take photos of the large environmental water releases from Jindabyne Dam. The aim was to see if the photos were suitable for analysis and, particularly, whether the photos could be accurately positioned using mapping software. The photos obtained from the drone were more detailed than the photos taken in 2010. Although on-ground location accuracy was up to 3 m different, the trial was considered a success as these small errors are easily corrected.



Figure 1. A drone in action over the Snowy River

The drone again collected photos during low flows in March 2019. These photos show more of the river channel and allow us to assess changes in the channel and surrounding vegetation.

Outcomes

From the photos, we can see that recent environmental flows have removed vegetation growing in the riffles, which are the faster flowing areas of the river.

The construction of Jindabyne Dam led to many years of low flows downstream of the dam. These low flows allowed vegetation to grow into the river channel. Riffles became smaller and the vegetation trapped sediment, which smothered the spaces between cobbles where many aquatic organisms live.

Increased environmental flows have led to faster-flowing riffle areas. Vegetation has been removed by these flows, providing better quality, sediment-free habitat for the organisms that live there.

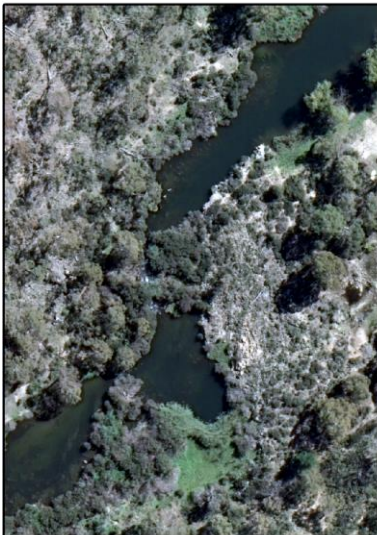
In many places, the low-flow river channel has become wider, providing more habitat for aquatic organisms. The flows also removed sediment deposits from pools. Current environmental flows being released from Jindabyne Dam support this return to more natural river processes.

The following pages provide photo comparisons at each site (Figures 2 to 6). Some sites show more signs of change than others. The degree of change depends on the site's local conditions and its distance from the dam. The further downstream the site is, the more the effects of the dam are reduced, as more tributary flows join the Snowy River. The impact of environmental flows is also reduced the further away the site is from the dam.



Removal of vegetation from within riffles and widening of some flow channels.

Vegetation chokes the channel and causes too much sediment to build up. This reduces the amount of space for the animals that need to live in the faster flowing well oxygenated areas of the river.



Removal of vegetation from within riffles and widening of some flow channels.



Removal of vegetation from within riffles and widening of the low flow channel.

This shows that the river is adjusting to the increased flows. Decades of little flow in the river has allowed vegetation to colonise the old river bed. The removal of this vegetation allows natural river forming processes to resume.

Figure 2. Photos of Site 1—Snowy River downstream of Mowamba River junction in 2010 (left) and 2019 (right). The river is adjusting to the increased flows.



Removal of in-channel sediment bars and associated vegetation.

A large 650 m² vegetated sand bar has been removed.



Removal of in-stream vegetation within and along riffles.

Low flow channel is wider.



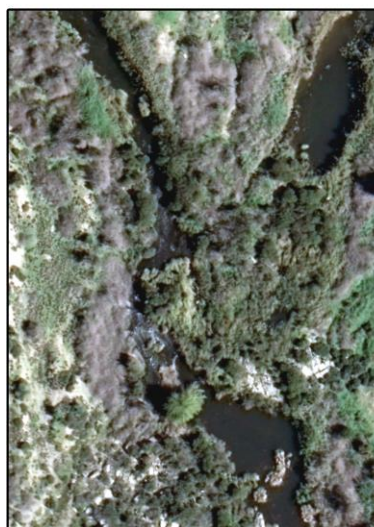
Removal of in-stream vegetation within and along riffles.

Low flow channel is wider.

Figure 3. Photos of Site 2—Snowy River at Sugarloaf Creek in 2010 (left) and 2019 (right) showing the removal of in-channel sediment bars and in-stream vegetation



The low flow channel has widened in some of the faster flowing sections at Site 3 although not as much as seen in some of the upstream sites.



Removal of vegetation from within riffles and widening of some low flow channels.



Very little change in some reaches.

Figure 4. Photos of Site 3—Snowy River downstream of Sugarloaf Creek junction in 2010 (left) and 2019 (right)

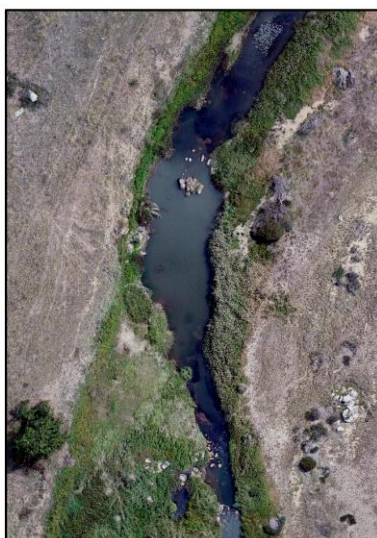


Site 4 located in the Dalgety Uplands reach is one of the more responsive sites. The larger flows have caused the widening and, in some cases, deepening of the channel.

The fast flowing areas have become wider providing greater habitat areas for the animals that live there.



In 2010 there was evidence of sediment and sand build up in the pools and runs at this site. The sand has been removed in some areas which shows that the environmental flows are able to move bed sediments along the river.



Sediment build up has been removed and the low flow channel has widened.

Figure 5. Photos of Site 4—Snowy River downstream of Blackburn Creek junction in 2010 (left) and 2019 (right).



Site 5 is located in the Burnt Hut gorge section of the river. This area is very much controlled by rocky outcrops so no large changes are to be expected in the physical condition of the river, at least at the middle range flows provided by the environmental releases.

In 2012, a 64000 megalitre flood flowed from the Delegate River into the Snowy just upstream of the Burnt Hut site. This flow is about 6-8 times the maximum environmental flow. This event removed a large sandbar and a small riffle. The changes are evident in the photos and were confirmed by field inspection at the time.

Figure 6. Photos of Site 5—Snowy River at Burnt Hut in 2010 (left) and 2019 (right)

More information

For more information about this project, contact water.science@dpie.nsw.gov.au

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