



**SAVING
WINTON'S SAUROPOD
TRACKWAY**



The trackway in March 2018 prior to cleaning and excavation. The dead trees in the bottom of the creek were growing in sauropod footprints and had numerous roots under the trackway.



Harry Elliott cleans overburden from around sauropod tracks with an air blast hose.



The edge of the sauropod trample zone revealed. The footprint sets exposed here belong to an 18m long sauropod and are the best preserved sauropod tracks on the trackway.



Judy Elliott searching for missing edges of the trackway. This section was uncovered by floodwaters in 2000 and is very fragmented. The area directly behind her was once part of an extended sauropod trample zone that was washed away by floodwaters many years ago. The isolated rock band in this area contains sauropod track under-prints.



Building a pad out of compacted wet mudstone for the trackway at the Museum's Dinosaur Canyon. The yellow-topped pegs show the gravel height needed in order to replicate the base shape of the trackway in its original location.



ON 14 February 2019 the Queensland Minister for Innovation and Tourism Industry Development, the Hon Kate Jones, announced the discovery of Australia's best-preserved sauropod tracks on a property west of Winton in western Queensland. Since the announcement several people have posed the question, "Why did they have to be moved?" It's a simple question but it has a complex answer so, to begin, we will explain exactly where the trackway is located and how it is preserved, and provide a brief background on its recent history and circumstances. The trackway was partially exposed in the January 2000 floods when a small creek broke its banks and carved a new channel. The property owner saw large impressions in an exposed rock shelf at the time but didn't recognise them as footprints. It

wasn't until 2016 that our team from the Australian Age of Dinosaurs Museum found out about the impressions and, by this time, the tracks had already been significantly damaged due to exposure to the elements. Damage to the trackway included broken and collapsed edges, fragmented surfaces and (as we found out later) a section of sauropod trample tracks had been completely obliterated by previous flood waters. The creek was also congested with recently poisoned prickly acacia trees and some of the sauropod tracks had the trunks of these now-dead trees in them.

In March and April 2018 Museum staff and volunteers excavated around the trackway. This was done using earthmoving machinery and a blast hose connected to a high-volume air compressor.

Dinosaur Dreaming and Australian Age of Dinosaurs Museum staff with the sauropod trample zone wrapped in plaster jackets ready for removal.

The blast hose proved to be a valuable tool as it removed the final layer of soil and debris without marking the trackway surface. Once uncovered we found that the trackway was about 10m wide and 55m long. The trackway petered out about one metre below the bottom of the gully at one end and disappeared at the other end where it came in contact with the upper black-soil layer. The closer to the surface, the more its preservation deteriorated.

The trackway section at the bottom of the gully was a trample zone where a number of sauropods had walked through. It consisted of large circles of fragile rock (10–20cm high and thick) in soft yellow sandstone and was extremely fragile. Alongside the trample zone we uncovered a series of large sauropod footprint sets that led to the weathered section exposed in 2000. They were made by an animal around 18m long and were absolutely magnificent! These tracks (like the rest of the trackway) are preserved in a band of rock that varies between 10cm and 30cm thick. Below the rock band is a deposit of soft yellow sandstone soil. Many of the footprints do not have a base but show a detailed outline of the sauropod's foot. There are at least two other sauropods that can be identified on the trackway including a sub-adult that would have been about 11m long.

Due to its fragility and location, we knew that the trample zone, which comprises about 20% of the total trackway area, would not survive exposure to water or mud. Between June and September 2018 we applied 400 litres of paraloid (plastic resin dissolved in acetone) to this section to harden it and then pedestalled around the rings of rock and covered them with plaster jackets (like we do with dinosaur bones). A crew from Dinosaur Dreaming (seasoned dinosaur diggers from Victoria) came up to help and by the end of September we had removed the most fragile section.

The rest of the trample zone was removed over the following three months, with our crew often working in temperatures over 40 degrees. The Museum would like to say a big thank you to the property owner, Mike Elliott, who was always available with his tractor to lift and load each section. By early January 2019 we were confident that everything remaining would withstand a normal run in the creek and, less than three weeks later, the property was inundated with over 500mm of rain.

The remaining 75% of the trackway is now under water and mud! We expect some minor damage but are confident that it will be repairable as long as we get back to it quickly. Still, it is a setback and we will be looking for volunteers to help us relocate the remainder before the heat of summer returns.



Bob and Judy Elliott fitting sauropod tracks back together at the Museum in November 2018.



Mike Elliott loading trackway sections onto the trailer with his tractor.



Trackway trample zone plaster jackets in position at their new home. Relocating this section has been the most challenging part of the trackway relocation to date.



Judy Elliott and Wendy White repairing fragmented sauropod tracks that have been exposed to the elements since 2000.



Dig crew taking laser level readings of plaster jackets. A combination of triangulations, height measurements and line marking ensured that all of the trample zone sections could be refitted into their exact position at the Museum.

Q. WHY DOES THE TRACKWAY NEED TO BE MOVED?

A. It will soon disintegrate if left in its current location.

Q. WHY COULDN'T WE LEAVE THE TRACKWAY WHERE IT WAS AND PUT A BUILDING OVER IT?

A. Changing the course of a creek and erecting a building over a trackway that is underground, in a remote area, on private land and in heavy clay soil is simply not feasible (or possible as evidenced by the recent flooding). Even if it had been feasible, the public would not have gained access to them without a massive (and risky) investment of time and money.

Q. WHY NOT JUST REPLICATE THE TRACKWAY AND THEN REBURY IT?

A. Much of the trackway is actually too fragile to replicate and, besides, it is huge. However, the Museum carried out a comprehensive photogrammetry exercise of the trackway to record it in case flooding destroyed the fragile section before we could get it out. Covering a trackway located in heavy clay soil (particularly in a creek) would eventually destroy it due to the shrinking and swelling nature of black soil that forces cracks in the rock apart. We encounter this same problem with dinosaur bones that are always fragmented when located close to the black-soil layer.

Q. WON'T REMOVING THE TRACKWAY BREAK UP AND DAMAGE THE FOOTPRINTS?

A. No. The trackway has thousands of cracks criss-crossing through it and these have already caused some damage. When removing each section the rock slab is gently (and fractionally) lifted up and down to identify which cracks are going to separate. This area is then thoroughly consolidated with paraloid to ensure that no rock chips can go missing during its transportation. It is a slow, thorough and methodical process but it has proved to be very successful.

Q. ISN'T VALUABLE INFORMATION GOING TO BE LOST BY MOVING THE TRACKWAY?

A. It is important that we preserve the scientific integrity of the trackway as much as the trackway itself. For this reason it has been relocated into the exact orientation it had in the bed of the creek. The trackway was mapped in August 2018 by professional surveyors and a consolidated gravel pad was built to these specifications at its new location at the Australian Age of Dinosaurs

Museum's Dinosaur Canyon. The tracks, once relocated, will be identical to how they were, with the animals walking in the same direction and the slope and relative height of each track positioned exactly how it was found. This involves the slow, laborious use of a laser level and string lines and it takes about three days to put down what we can lift up in a half day.

Q. WHAT ABOUT UNDER-PRINTS BELOW THE TRACKWAY? WILL THESE BE LOST?

A. Yes and no. Unlike the solid rock under-prints of sauropod tracks at Broome on the northern coastline of Western Australia, under-printing of the Winton tracks is hard to find. As most of the footprints do not have a solid rock base, the soft soil below them is riddled with roots from trees and other vegetation that grew in the tracks. Cracking of the soil has also allowed black soil to penetrate below the footprints and this has broken down the soil structure in most places. Nevertheless, there are several tracks that do have rock bases and we are hoping to find under-prints in the soil below them when we get to them. If so, we will be able to document these in cross-section. There are also several under-prints preserved in flat, rocky concretions beside the damaged section (exposed in 2000) that are repairable and these will be relocated with the trackway.

Evidence of the trackway extends well beyond the rock-shelf section and trample zone. These prints are very deep (around 2m below the creek bed) and are not preserved in rock. Rather, they are thinly layered impressions in soil that can only be identified in cross-section. There is a wealth of stratigraphic information, including under-printing, in this area and the Museum's research team will be studying this in much greater detail at a later date. Once exposed, this dirt area will need to be documented as quickly as possible as it will degenerate rapidly. For now it will remain buried until we have the time and resources to consolidate and preserve it.

Dr Stephen Poropat of Swinburne University, who is leading our research team, has recently submitted a scientific paper describing the new trackway, which contains the tracks of not just sauropods, but small ornithopods and theropods as well. As soon as this paper is published we will be able to provide a detailed description of exactly what the new sauropod tracks mean to Australia and where they fit into our understanding of other sauropod tracks around the world.

The discovery of this trackway is a huge boost to western Queensland tourism and will play a major role in the region's future sustainability. With nearly seven years of drought behind us, followed by devastating floods, the west needs positive news like this more than ever before. Our team at the Australian Age of Dinosaurs Museum is determined to bring this to fruition so that visitors of all persuasions and nationalities can visit the Outback and enjoy a natural phenomenon that is truly inspiring to see. Each new Australian dinosaur discovery helps to increase interest in dinosaur-related tourism and science all over the country and it is this interest that encourages our Museum, and other organisations like ours, to contribute.

Removing one of the larger rock sections from the trackway in mid-January 2019.





Fitting trackway sections back together at the Museum in December 2018.



The trackway as it looked on 27 January 2019, just two days before the 2019 floods started. The plaster jackets in this photo are holding fragile rock together which will save them from becoming dispersed by water. Unfortunately the pallet of trackway edges in the bottom of the creek was left there and is now buried under mud.



Judy Elliott adding finishing touches to the sauropod trample zone the day before the discovery was announced. This area is now nearing completion.

Finishing touches being applied to the trackway at its new location in mid-February. Around 25% of the trackway has now been relocated.

