



“Royal HaskoningDHV’s integrated team of geomorphologists, ecologists and engineers have produced an innovative and sustainable design for ‘rewilding’ the River Adur. The team used their considerable expertise and previous experience in this area to create a viable scheme, mitigating the risk of flooding, which was a potential show stopper.”

Charlie Smith
Environment Agency

River Adur: going back to the future

The 3,500-acre Knepp Castle Estate, home of the Burrell family for more than 200 years, was once a traditional arable and dairy farm. No longer – in 2001 Charles Burrell took 500 acres of land out of production, replanting his cornfields with native grasses and wildflowers, and began his ‘re-wilding’ experiment. Drawing inspiration from Oostvaardersplassen, a remarkable nature reserve in the Netherlands, he introduced a herd of Old English Longhorn cattle, Exmoor ponies, fallow deer and Tamworth pigs, and tore down internal gates and fences to allow the animals to roam at will.

The Knepp Wildland Project has since released another 1,000 acres from intensive farming, with the aim of returning the land to a natural state and producing a minimum-intervention landscape. The next challenge is to restore, or ‘rewild’, the 2.5 km stretch of the River Adur which flows through the estate. This has been heavily modified by more than two hundred years of human activity and was canalised in the 18th century creating a wide, deep, uniform channel largely cut off from its floodplain.

In August 2009 Royal HaskoningDHV was commissioned by the Environment Agency to produce detailed designs for rewilding this reach of the river. Royal HaskoningDHV adopted a partnership approach to ensure success, working closely with the Environment Agency, Natural England, Sussex Wildlife Trust and the Knepp Castle Estate, with technical advice and guidance from the River Restoration Centre at Cranfield University.

Ian Dennis, Royal HaskoningDHV’s project manager and lead geomorphological designer said: “This is the biggest proposed stretch of river to be naturalised in Britain, and a unique opportunity to create a new river and floodplain landscape in which natural processes operate freely. The river needs to be sustainable and able to meander naturally across the land, encouraging the return of seasonal flooding and attracting even more wildlife.”

Royal HaskoningDHV’s integrated team of geomorphologists, ecologists and engineers produced an innovative design which recreated an approximation of the former course of the river. Using LiDAR, (laser radar data), which produces three dimensional pictures, the team could clearly see former courses, tell which ones were connected and previous natural meanderings. These findings were combined with detailed Tuflow (simulation) modelling, examining the behaviour of the river and its floodplain.



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Ian Dennis continues: “The new channel will have a considerably smaller capacity than the existing one, and results from the Tuflow model show that a larger proportion of the floodplain will be inundated more regularly. We responded to this challenge with more detailed simulations to drive the design, ensuring that floodplain wetness can be increased without increasing flood risk to adjacent properties and infrastructure.”

A range of habitats will be allowed to develop in the restored river and floodplain, with large woody debris incorporated within the channel and backwaters to increase flow and habitat diversity, and protect the river banks. Additional features such as backwaters, ponds and floodplain scrapes, or low-lying ponds, are also included.

Royal HaskoningDHV has also undertaken a detailed environmental impact assessment to ensure existing habitats are not damaged and valuable sites are incorporated into the design. So, for example, the plan includes reinstating historically valuable features such as

the ‘causeway crossing’ which, since the 1700s, used timber bridges joining mounds of earth so people could cross the floodplains. Today only the mounds exist, but replacing the bridges as they were, will create a public right of way, that will become a feature in its own right.”

The creation of a rewilded river in which natural processes operate freely, will play a key role in the Knepp Wildland Project. It will also contribute towards the implementation of the Water Directive Framework Directive, the Environment Agency’s ‘Creating a Better Place’ strategy, and the Biodiversity Action Plan habitat creation targets.

The first phase of works was completed during 2012, and the second phase was completed during spring 2013. The finished scheme was officially opened by the Knepp Castle Estate in July 2013.

Ian Dennis

T: +44 (0)1444 476632

E: ian.dennis@rhdhv.com