www.waterengineeringaustralia.com.au

WATER ENGINEERING AUSTRALIA

ENGINEERS AUSTRALIA
Water Engineering

COMEBACK CONDAH

Returning water to the lake

- SOFTWARE
- STORMWATER

Volume 5 Number 6, October 2011

$11.00 INCL. GST

For thousands of years, the Gunditjmara people have been building hydraulic structures to trap fish at Lake Condah in Victoria. After European settlement, the lake was drained. A new weir has recently been built to restore water to the site. The project employed local indigenous people, some of whom have gone on to seek work in the construction industry.

BRINGING BACK THE WATER

The Lake Condah Restoration project aimed to restore water to the lake, reactivate some of the ancient fish traps and provide environmental benefits with minimal impact on upstream or downstream landholders.

Lake Condah Restoration has won the Engineers Australia's South Australia Division Excellence Award 2011 for project management. The lake near Heywood in western Victoria forms part of the Budj Bim National Heritage Landscape with cultural and ecological significance.

Through carbon dating, it has been established that the Gunditjmara people at Lake Condah were building eel trap systems to support permanent settlements from around 8000 years ago. These systems indicate a highly organised, hierarchical society, based on aquaculture, at a time when most humans on earth were hunter-gatherers. The Aboriginal hydraulic works at Budj Bim will be recognised as a National Engineering Heritage Landmark by Engineers Australia on 21 October.

The Gunditjmara came into violent conflict with Europeans. A mission was eventually established at Lake Condah in the 1860s, but the Gunditjmara continued to trap fish from the lake in the traditional manner.

During the 1950s the lake was effectively cut in half and drained as part of major engineering works to drain the Wallacedale and Condah swamps to the north. Since then, Lake Condah has only retained water during floods, and even floodwaters were quickly lost because of the drain. The drain had stopped seasonal inundation patterns, preventing the traps from functioning, leading to environmental deterioration and causing distress to the traditional owners who have maintained strong ties to the land and traditional practices.

The Lake Condah mission was returned to the Aboriginal community in 1987.

The Lake Condah Restoration project aimed to restore water to the lake, reactivate some of the ancient fish traps and provide environmental benefits with minimal impact on upstream or downstream landholders.

The project objective was to reinstate the lake by installing a weir regulator across the outlet drain. The structure was to have

Engineers worked with the indigenous community to build a rock weir that fits in with the surrounding landscape.

height of 52m AHD, allowing environmental flows of 20ML/d to minimise impact on downstream flora and fauna, and to allow fish to pass up and down the weir. The system should be able to be modified in the future by raising the crest of weir or adjusting environmental flows. It should also be low-maintenance with low ongoing costs.

When GHD's South Australian team was commissioned as project manager, the client (Victorian Department of Sustainability and Environment) had already developed a concept design of two rock-faced concrete weirs, assuming it to be the best solution. Instead, following a fact-finding session, GHD developed a functional design brief for the designer Alluvium that focused on the key elements and client aims. This resulted in a much better outcome, as Alluvium designed a low-gradient rock chute incorporating a low-flow channel for fish passage. The 3m high, 100m long rock structure fits with natural outcrops at the site and bears similarities to the traditional owners' fish chutes and traps. The environmental flows are provided by a bypass pipe installed on the right bank, together with an inlet and outlet structure that automatically monitors and maintains flow at a designated value. The rock was sourced from a small local quarry.

The original budget of $400,000 allocated to the project was too low. One of the first tasks of GHD was to develop a project management plan, which included a high-level cost estimate. The final budget was set at approximately $1 million. The company worked with the client to allow adequate time for additional funding to be sought.

The work had to be completed during summer because the site was inaccessible in winter due to high water levels within the drain.

It was also necessary to perform cultural heritage surveys of the site to determine the potential for disturbances of indigenous artefacts and monitor cultural heritage during construction.

The employment of local indigenous crew was encouraged during the tender process, but the project team took it much further than was originally thought. The weir was built by local unemployed indigenous people, resulting in strong community bonds and a sense of ownership of the project. Six people have gone on to seek employment in the construction industry.

The contractor was Armistead Earthmoving.

This project sets a benchmark in project management as the project manager worked closely with all stakeholders from the outset to truly understand their needs rather than proceeding with a predetermined solution.

This project demonstrated that engineers can provide an overall understanding of a multitude of processes, can work with the stakeholders to deliver solutions, can approach projects systematically and logically, and can adapt to change to deliver positive project outcomes. ●

This article is based on GHD's submission to Engineers Australia's South Australia Division Excellence Awards 2011.