NATURAL FLOOD MANAGEMENT CASE STUDY: BIRDS PARK RESERVOIR, KENDAL

BACKGROUND INFORMATION

Birds Park was a disused reservoir which is located to the east of Kendal's Sandylands Estate. The reservoir had previously been the main source of water supply for Kendal until it was no longer required to be used for this purpose. The location of the former reservoir, which is owned by United Utilities, made it a suitable option to change the purpose from a former water supply to a Natural Flood Management (NFM) demonstration site to manage the flood risk for the surrounding area.

Image: Environment Agency

An NFM project involves using various techniques to restore or mimic the natural functions of rivers, floodplains, and the wider catchment to store and slow the flow of water to manage flood risk.

Following the extreme flooding caused by Storm Desmond in 2015, which saw over 600 properties flooding in Kendal, multiple organisations formed an NFM project partnership and work began on Birds Park in 2020. The scheme was funded as part of a wider catchment-based approach to reducing flood risk in the River Kent catchment. Defra (Department for Environment, Food and Rural Affairs) allowed £2.5m of funding for Cumbria for NFM schemes.

A partnership was created between:

- United Utilities (UU)
- The Environment Agency (EA)
- Cumbria Wildlife Trust (CWT)

The project aimed to slow the flow of water by creating a natural obstacle and temporary water store located close to the source, which would slow and reduce the volume of water downstream. It was important the scheme gave the community confidence that the natural environment would be improved and enhanced due to the importance of the landscape in the tourism sector for the area.

ABOUT THE SCHEME

A combination of NFM approaches were used to increase the lag time and the former reservoir's capacity to store and slow the flow of water. Some of the approaches used were:

Hydro-fences - The hydro-fences were created with help from Kendal Conservation Volunteers (KCV). The structures used a new technique as they incorporated the use of willow to create a living hedge that can store and slow water whilst requiring less maintenance and increased longevity.

Earth bunds - A total of 8 earth bunds were created which slow and control the movement and direction of water during high rainfall as it navigates and meanders through the new course.

Leaky dams - Ten leaky dams were installed throughout the old reservoir which have created barriers that slow the flow and several slow-flowing pools.

Tree planting - A total of 8000 trees have been planted of a variety of species including willow which grows quickly and thrives in wet conditions. Volunteers from KCV helped plant the trees along with the EA and CWT.

In addition to these techniques used above, swales and kested hedgerows were also installed throughout the reservoir to create a wetland that is now able to improve biodiversity, improve water quality and manage flood risk.

Images: Environment Agency

Birds Park Reservoir now operates in a maze-like way which increases the time taken for rainfall to travel downstream which increases the lag time and eases peak flow further down the catchment. The new natural structures will temporarily hold back the flow of water during storm events and the water which is stored within Birds Park will be slowly released during the 10 hours after the flood peak, greatly reducing the potential flood risk on the properties located nearby. The total area of the reservoir is approximately 1km square and approximately 10,000 cubic metres of water is stored temporarily as the water meanders its way through.

MULTIPLE BENEFITS

Managed flood risk - The town of Kendal, its residents and businesses have seen their flood risk better managed with the NFM project.

Improved vegetation quality and density - Plant life has improved in quality and variety as a result of increased daylight into the old reservoir through the removal of old canopy trees. The diversity in vegetation slows the flow of water due to the roughness and increased evapotranspiration rates.

Improved wildlife - The area has become full of a variety of insect species due to the improved vegetation. This has provided a food source for small animals and a variety of Raptor species have since been spotted.

Improved water quality - The NFM techniques used filter out pollutants from the water as it travels through Birds Park whilst also absorbing CO2 from the air.

DATA COLLECTION

The success of the scheme is being monitored by researchers at Lancaster University who will collect and analyse the data from Birds Park reservoir. The results will be used to influence how NFM may be used elsewhere in Cumbria in the future.

Watch a YouTube video of the project here:
https://www.youtube.com/watch?v=pNhlZkcP1-4