



## Parrett Internal Drainage Board

*Part of the Somerset Drainage Boards Consortium*

## Southlake Moor Favourable Condition Project

### INTRODUCTION

Southlake Moor Favourable Condition Project has restored 200ha of floodplain grazing marsh on the Somerset Levels to favourable condition, whilst also providing improved water level management for farming, enhanced flood storage and a valuable education resource. The project has been developed and implemented by the Parrett Internal Drainage Board (IDB), as part of a wider Multi-Agency Project that also includes the other IDBs in Somerset, Natural England and the Environment Agency.

Changes in water level management on Southlake have benefited wet grassland and ditch habitats and a wide range of wetland species, including large numbers of wildfowl and waders that now use the flooded grasslands in winter as a safe roost and feeding site.

A complex mix of issues had to be addressed before any changes in water management could be made. These included the need for major improvements to the water control infrastructure and changes in land management practices. The involvement and support of local farmers and communities was therefore central to the success of the project and to developing a locally appropriate and practical approach. Public consultations events, project group meetings, site visits and newsletters have been used throughout the five year project to help increase awareness and appreciation of the issues.

The engineering works for the project were supported financially by Defra grant-in aid funding and Natural England has established Higher Level Stewardship agreements with farmers to help support changes in land management and enhance wet grassland and ditch habitats. The ongoing operation and maintenance of the system is funded from local revenue raised by the Parrett IDB.

The Southlake Project is the first wetland restoration scheme to be completed by the Parrett IDB and marks a significant change in the Board's activities towards more multi-functional and sustainable management of floodplain wetland systems.



**Southlake Moor – Winter 2009/10**

## STRATEGIC PLANNING

The IDBs in Somerset have been working with Natural England and the Environment Agency to prepare and implement Water Level Management Plans for wetland SSSIs in their districts. These new plans aim to provide better water management for wetland wildlife, farming and flood risk management. The main environmental objectives of the plans are to achieve the favourable condition requirements for the Somerset Levels Sites of Special Scientific Interest (SSSIs) and Special Protection Area (SPA). Across all IDBs in Somerset, the implementation of the Water Level Management Plans has contributed over 3,500ha towards the Defra target of achieving 95% of SSSIs in favourable, or recovering, condition by December 2010.

The Somerset IDBs have recently produced a Biodiversity Action Plan (BAP) for their districts to inform and support their environmental work and contribute to the delivery of priority UK BAP species and habitats. It will also help the Somerset IDBs address wider biodiversity issues outside the protected site network.

Please refer to the following link for more information about the Somerset IDB Water Level Management Plans and Biodiversity Action Plan:

<http://www.somersetdrainageboards.gov.uk/html/conservation.html>

## PROJECT OBJECTIVES

Winter flooding on Southlake is a historic management practice that was specifically referred to, and permitted, in the Land Drainage Act of 1830. The same Act also established the first Drainage Board in Somerset. Winter flooding ceased to be a regular feature of the site over 20 years ago when it became impractical and unsafe to operate the system. Difficulties in controlling water levels made winter flooding unpopular with farmers and the practice was generally viewed as being incompatible with modern farm systems. Winter flooding on Southlake did however produce excellent conditions for wildfowl and waders that visit the Somerset Levels in winter and, in particular, provided shallow and deep water conditions that are much harder to achieve and sustain on other wet grassland sites in Somerset. Southlake is therefore an important part of a wider ecological network of sites that form the Somerset Levels and Moor SPA (Figure 1). For these reasons, the favourable condition objectives for Southlake required the restoration of winter flooding for the site. Southlake is also important for its grassland communities, aquatic plants and invertebrates, breeding birds, otters and water voles, and the water and land management requirements of these features also needed to be considered by the project.

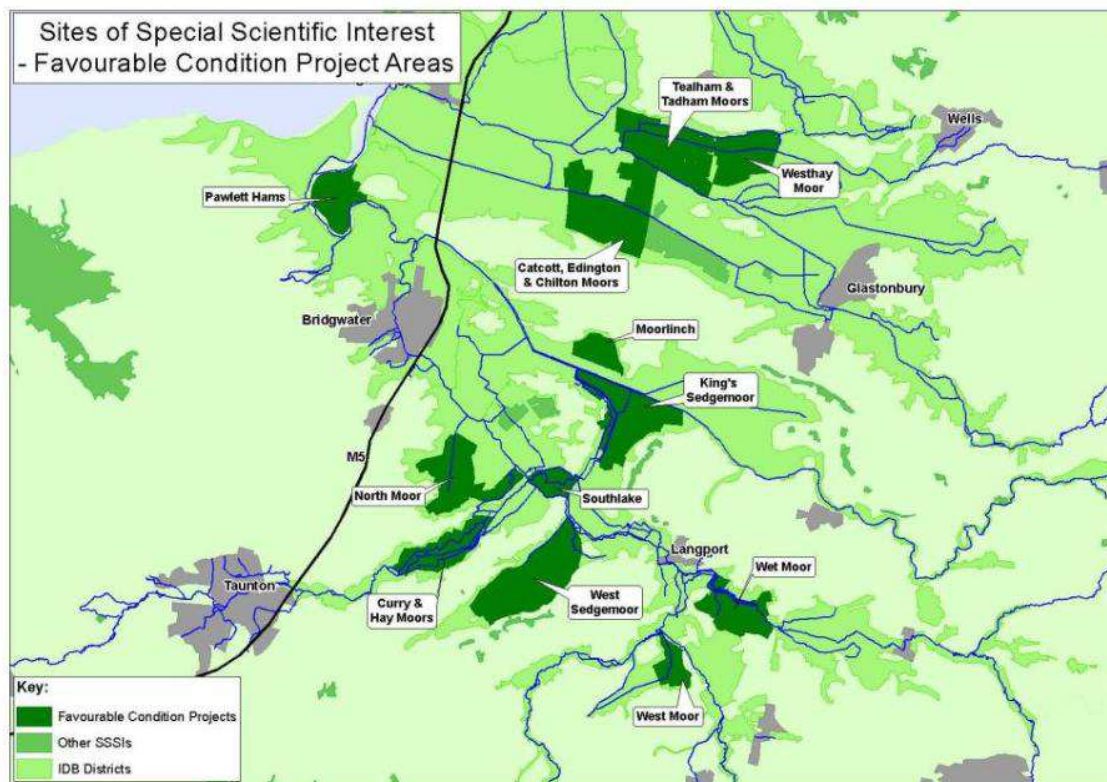


Figure 1. Somerset Levels wetland SSSIs



## ENGINEERING WORKS

The project assessed a wide range of options for restoring winter flooding to Southlake and decided that the old system would be difficult to restore and sustain operationally. The opportunity to provide a range of other benefits also supported the decision to make major changes in the layout and operation of the system. The main engineering works included:

- The construction of a new high capacity inlet that allows significant volumes of flood water on to Southlake from the adjacent river system. The inlet can be used to evacuate water from Southlake, as well as provide fine water level control in summer when it is used to supply water to the ditch system.
- Other control structures were also improved, replacing undershot sluice doors with tilting weirs that offer much finer water level control than the old system.
- A new isolation bank was constructed to protect local roads and areas outside the site from flooding when Southlake is being used for flood storage.
- The installation of a remote water level telemetry system to inform operations and provide environmental data. This is the first IDB telemetry system in Somerset.
- A new inlet channel was dug to allow flood flows on and off the moor, which included a two-stage profile (shallow shelf) for marginal plants and water voles.
- A small raised water level area, established under the Environmentally Sensitive Area scheme for Somerset, was decommissioned by removing control structures and reconnecting ditches and pipes that had been blocked to form hydrological blocks in the centre of the moor. The raised water level area had been only partially successful and was difficult to operate and maintain. Removing it has re-established a single, more connected, system for Southlake, where the main control structures and raised banks are now used to manage water levels and flows across the whole site.



**New water control structures provide improved water level management throughout the year**



**New inlet channel with two-stage profile**



**Decommissioning the raised water level area**



## WATER LEVEL MANAGEMENT (OPERATIONS AND MAINTENANCE)

The new IDB inlet for Southlake was operated for the first time in December 2009, allowing high flows from the River Sowy to flood Southlake between December and February. High rainfall and river flows in early December provided ideal conditions for testing the system. Water levels on Southlake reached a maximum level of 4.4m (ODN), equating to a volume of approximately 600,000m<sup>3</sup>. The total capacity of the moor is 1,200,000m<sup>3</sup>. The maximum water depth in the centre of the moor was about 30 – 50cm. The new inlet was also used to evacuate flood water back to the River Sowy and water levels on Southlake had returned to their normal winter level by mid-February.

This operation was repeated in December 2010, during an unusually cold and dry start to the winter. The Southlake system has been designed to enable good conditions to be achieved even when there are low flows in the river system. This is particularly valuable during dry winters, when many other areas remain dry and could not have been achieved with the old system. The system has also been designed to provide maximum operational flexibility. This allows structures to regulate and maintain levels on Southlake, whilst also allowing passive flood attenuation when excess water is available in the adjacent river system.



Operation of new IDB inlet – winter 2009



Flood water from the River Parrett can now be attenuated on Southlake for environmental and flood management benefit

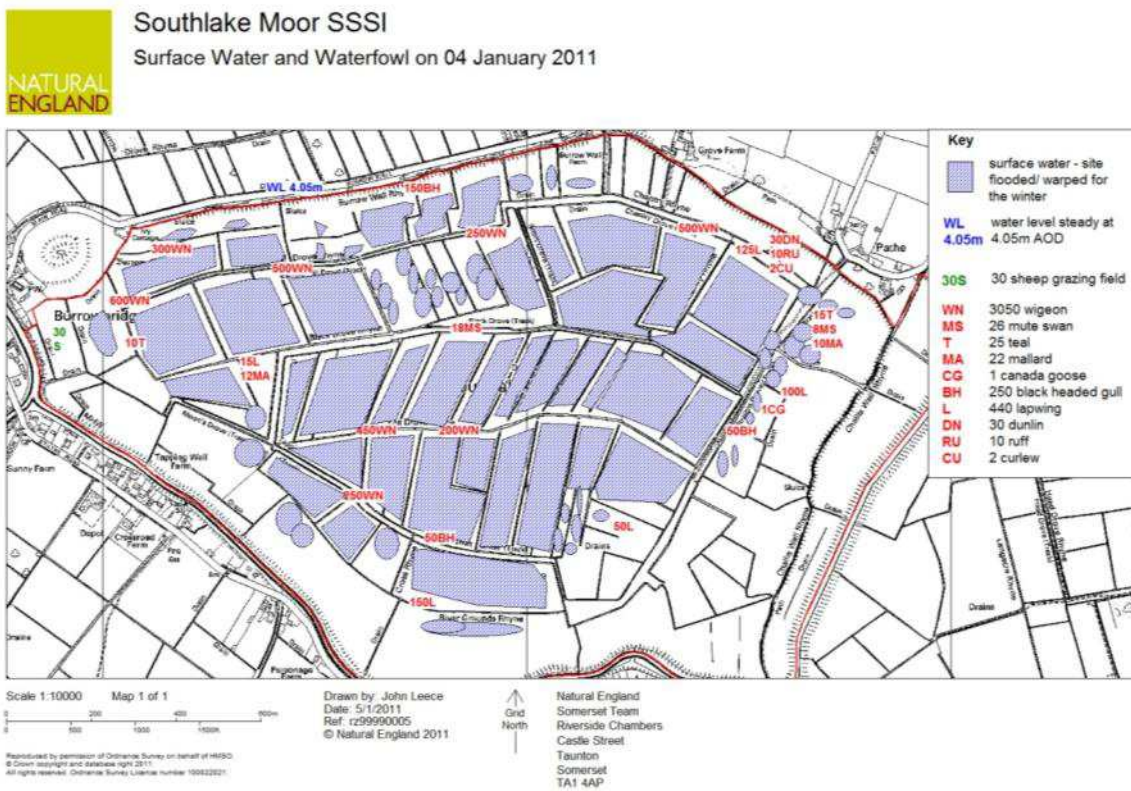


## ENVIRONMENTAL OUTCOMES

The restoration of winter flooding to Southlake in 2009 produced record bird counts for the site. Bird numbers were at their peak in mid-January, when over 4,000 wigeon, teal and lapwing were present, along with good numbers of Bewick's swan, pintail, shoveler, golden plover and gadwall. Curlew, dunlin and ruff have also been using the site in 2010.

Ecological and environmental monitoring is a key component of the Southlake Project. The Parrett IDB has been working closely with Natural England, the RSPB, the Somerset Farming and Wildlife Advisory Group and the British Association of Shooting and Conservation to collect environmental data to inform management and operational decisions. The main monitoring work includes:

- Water levels
- Winter bird counts
- Grassland communities
- Ditch communities (plants and invertebrates)
- Breeding wader surveys
- Water voles
- Invasive non-native species



Mapping of surface water and winter bird counts (January 2011)



Remote telemetry provides a continuous record of water levels from key locations on Southlake



## FARMING AND HABITAT MANAGEMENT

Grazing by cattle in summer and late hay cuts are essential to the maintenance of high quality grassland habitats on Southlake. Water level management also requires regular maintenance of ditches and field access culverts to sustain water flows and levels across the site. Without these routine farming and maintenance activities the habitat quality and biodiversity interest of Southlake would decline and some important species could be lost from the site.

Natural England has established Higher Level Stewardship (HLS) agreements across Southlake to help sustain environmentally sensitive farming practices on the moor that are compatible with the desired water management regime. HLS funding has also enabled farmers to reinstate field gutters, ditches and other wetland features on the site, which will assist water management and provide valuable habitat for plants, invertebrates and waders.



**New field gutter – funded by HLS**



**Summer grazing – essential management**

## PUBLIC ACCESS AND EDUCATION

Southlake is located in the heart of the Somerset Levels landscape with good public access around the edge of the moor. This includes Burrow Mump, a Scheduled ancient Monument owned by the National Trust, which is a focal point for visitors to the area and the River Parrett Trail that runs round the southern boundary of the site. From these vantage points, visitors are able to view the flooding on Southlake and watch the large flocks of birds without disturbance to the wildlife. This has been especially popular over the Christmas and New Year period.

Southlake Moor is a valuable education resource for wetland biodiversity management and the importance of links between rivers and their floodplains. The site is routinely used for training environmental specialists and land managers in wet grassland and ditch ecology, including training in species identification and habitat management. It is also frequently used as a location of site visits and community events, since Burrow Mump provides an excellent vantage point to view Southlake and surrounding Somerset landscape.



**Training for specialist in aquatic plant identification and site visits for environmental managers**



**Members of the public bird watching and viewing the spectacle of winter flooding on Southlake**



**Somerset Drainage Boards promoting their environmental work at a River Festival in Bridgwater**



**Parrett IDB site inspection to Southlake**



