# Othery, Middlezoy, Westonzoyland and Chedzoy Water Level Management Plan

## Parrett Internal Drainage Board

## Approved June 2009

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# 1. Approval of the Water Level Management Plan

This Water Level Management Plan has been prepared by the Parrett Internal Drainage Board for the Othery, Middlezoy, Westonzoyland and Chedzoy area of the Drainage Board District. Contributions to the WLMP have been received from the Environment Agency, Natural England and others.

| **Water Level Management Plan – General details** | |
|---|---|
| Plan area | Othery, Middlezoy, Westonzoyland and Chedzoy (Parrett IDB) |
| SSSI(s) covered | Southlake Moor SSSI<br>Langmead and Weston Level SSSI |
| Region / Area | Somerset Levels and Moors |
| IDB Lead officer | Philip Brewin, Ecologist |
| | |

| **Approval of the Water Level Management Plan** | | | |
|---|---|---|---|
| "I agree with the proposals and actions set out in this Water Level Management Plan and confirm the Plan will help achieve favourable condition for the Sites of Special Scientific Interest covered by the Plan." | | | |
| **Position & Organisation** | **Name** | **Signature** | **Date** |
| Chairman –<br>Parrett Drainage Board | Peter Maltby | | |
| Area Manager –<br>Environment Agency | Nick Gupta | | |
| Area Manager –<br>Natural England | Mark Watson | | |

# 2. Introduction

## 2.1. Purpose of the Plan

Water Level Management Plans (WLMPs) are required for all areas which have a conservation interest and where the control of water is important for the maintenance or rehabilitation of that interest. Priority is given to WLMPs for Sites of Special Scientific Interest (SSSIs), particularly those of international importance (e.g. Special Protection Areas, Ramsar Wetlands of international importance). WLMPs are a means of balancing and integrating water level management for a range of land uses and activities within an area, including agriculture, angling, flood risk and conservation.

The Government has established a Public Service Agreement (PSA) target to ensure that 95% of all SSSIs are in a favourable condition (or in an unfavourable but recovering condition) by December 2010. The PSA target is being applied to Natural England and to the Drainage Authorities operating within the WLMP area. In 2004, English Nature (now Natural England) carried out a review of wetland SSSIs in unfavourable condition and identified a number of priority sites where achieving appropriate water level management was critical to securing favourable condition. Two of the priority sites identified are within the area covered by this WLMP:

- Southlake Moor SSSI, with 80% of the area being in an unfavourable condition due to inappropriate water management. Therefore, one of the aims of this WLMP is to identify the water management necessary to bring this SSSI into favourable or recovering condition.

- Langmead and Weston Level SSSI is regarded by Natural England as being in favourable condition regarding water level management.

Southlake Moor SSSI forms part of the Somerset Levels and Moors Special Protection Area (SPA) and Ramsar site. The Parrett IDB recognises its status as a 'Competent Authority' for the purposes of the Conservation (Natural Habitats etc) Regulations 1994 when considering any plan or project which is likely to have a significant effect on features of European importance in the SPA. The IDB also recognises its duty to further conservation as part of its statutory obligations under relevant legislation including the Land Drainage Act 1991, the Countryside and Rights of Way Act (2000) and the Natural England and Rural Communities Act (NERC) 2006.

The WLMP will assist the Drainage Authorities, such as the Parrett IDB and the Environment Agency, to carry out their nature conservation duties across the Plan area. In addition, the WLMP will help the Drainage Authorities to ensure that the investment in infrastructure is appropriate and maintenance of these assets continues in the future.

## 2.2. Plan area

The Plan area covers 5933 acres (2401 hectares) of what was the old Othery, Middlezoy & Westonzoyland Drainage Board District combined with that of the Chedzoy Drainage District. Both of these areas now form part of the area managed by the Parrett IDB. The location and extent of the Plan area is shown on Map 1.

The drainage area is bounded on the south and south west by the River Parrett, on the northwest by Bridgwater, and on the northeast and east by the Kings Sedgemoor Drain. The boundary follows the edge of the built-up area of Middlezoy, out to the A372 (Langport to Bridgwater) road to include the area known as Nether Moor, south to Burrow Wall where it runs

slightly north of Burrow Wall Rhyne before joining it at Pathe. There it follows Burrow Wall Rhyne to Challis Wall Rhyne, which it follows in a southerly direction to the River Parrett.

The Parrett IDB is responsible for and maintains a network of arterial watercourses in its area which drain into Main Rivers maintained by the Environment Agency. These arterial watercourses are known as "Viewed Rhynes" and are taken into view or out of view by resolution of the Board.

There are 173 drainage ratepayers in the Plan area, the smallest holding being 0.22 acres (0.09 hectares) and the largest being 325.1 acres (131.6 hectares).

## 2.3. Responsibility for preparation and implementation of the Plan

The Parrett Internal Drainage Board is responsible for the preparation, overall monitoring and review of this WLMP on behalf of the Drainage Authorities operating in the area, namely the Parrett IDB, the Environment Agency, Somerset County Council, Taunton Deane Borough Council and Sedgemoor District Council. Each Drainage Authority has contributed information to enable the WLMP to be produced by the Drainage Board, and the end result is a collaborative effort by all the Drainage Authorities. Each Drainage Authority is responsible for implementing and monitoring their own actions within the WLMP, and for reporting on these matters to the Drainage Board as appropriate.

The Parrett IDB will adopt and implement the WLMP in accordance with the criteria set out in Box 1.

## 2.4. Consultation and Plan approval

The First Draft of the Water Level Management Plan was considered by the Parrett IDB WLMP Committee in March 2009 and was endorsed in principle for the express purpose of consulting others. Consultation with Statutory Bodies, other bodies and organisations, and with 170 drainage ratepayers, took place over a four week period in April 2009 and was based on the contents of the First Draft Plan.

Responses to the consultation exercise were considered by the Parrett IDB WLMP Committee when they met to consider the Second Draft of the Plan in May 2009. The Second Draft, which included amendments arising from the consultation process, was recommended by the Committee for approval by the Full Parrett Board at their meeting in June 2009.

On the 2 June 2009 the Full Parrett Board considered the Committee's recommendations and adopted the WLMP for Othery, Middlezoy, Westonzoyland and Chedzoy in full. The actions contained in Sections 9 – 15 of the Approved WLMP will be implemented over the five years of the Plan in accordance with the Timetable of Actions in Section 16.

## Box 1: The approval and implementation of Water Level Management Plans

The following criteria will be used by the Parrett IDB when considering WLMPs for approval and when implementing actions relating to:

a. Making recommendations regarding the approval of a WLMP as a plan of action;
b. The construction of a capital improvement scheme as proposed within the approved WLMP;
c. Changing water levels as proposed within the approved WLMP.

### A. Continuation of existing good practices

Where the WLMP includes proposals to '*continue the current good practices regarding water level management, watercourse maintenance and operational procedures'*, the Parrett IDB will satisfy itself that the current practices:

- Are technically sound;
- Satisfies the drainage and water level management needs of the area;
- Are environmentally sound;
- Are within the financial capacity of the Board to achieve;
- Will fulfil all the legal obligations of the Board, including those related to achieving favourable condition and biodiversity.

### B. Undertake a capital improvement scheme

Where the WLMP includes a '*proposal to carry out a capital improvement scheme'*, the Parrett IDB will satisfy itself that the proposed scheme:

- Is technically sound;
- Satisfies the drainage and water level management needs of the area;
- Is environmentally sound;
- Is within the financial capacity of the Board to achieve;
- Has been agreed in principle with the occupier(s) and owner(s) of the land where the capital scheme is to be built;
- Is within the legal power of the Board to implement.

### C. Change water level management

Where the WLMP includes proposal is to '*change the water level management, watercourse maintenance or operational procedures'*, the Parrett IDB will satisfy itself that the proposed change:

- Is technically sound;
- Satisfies the drainage and water level management needs of the area;
- Is environmentally sound;
- Is within the financial capacity of the Board to achieve;
- Is supported by the owners and occupiers of a significant majority of the land that would be affected by the proposed change being considered (see note below);
- Will fulfil all the legal obligations of the Board, including those related to achieving favourable condition and biodiversity;
- Does not carry a significant risk that the Board may face a legal claim for damages incurred by a third party as a consequence of its decision to change its current practice.

**Notes:** When considering a proposal to change water levels, the Parrett IDB will use the uptake of agri-environment scheme agreements (including proposals by the occupiers to upgrade their agreements), in the area likely to be affected by the proposed change, as an initial indication of the measure of compatibility of the farm holding/land management unit with the proposed change in water levels. Actual changes in water levels thereafter will be sought through the negotiation of appropriate land management agreements between the owners/occupiers of the land and the relevant authority (i.e. Higher Level Stewardship agreements between farmers and Natural England).

# 3. Hydrology, watercourses and infrastructure

## 3.1. Topography and soils

The land drained by the watercourses is low lying alluvium and surface peat bordering the right bank of the tidal River Parrett. The land surface varies from levels of 10m AOD near the river to 4m AOD further inland. High tides are prevented from inundating the low lying land by tidal embankments along the right bank of the River Parrett with crest levels between 8m and about 9m AOD.

## 3.2. Water supply

The mean annual rainfall for the Plan area is 680 mm. This figure has been calculated using data from three Environment Agency observer rain gauges located within the Plan area collected from 1999 to 2007.

The Penzoy River is the principal watercourse supplying water in this Plan area. The Penzoy is connected to the River Sowy at Aller Drove Sluice and it flows from Aller Drove through Southlake SSSI, Earlake Moor and Weston Level SSSI before eventually discharging into the King's Sedgemoor Drain (KSD) further downstream via Chedzoy New Cut.

The network of Viewed Rhynes and private ditches are connected to the Penzoy to irrigate the other watercourses in the Plan area. There is a small catchment immediately around the Plan area which provides a small volume of water to the rhyne network during periods of rainfall. This water supply system will change with the completion of the new Drainage Board inlet structure from the Sowy into Southlake. These changes are described in Section 9.

## 3.3. Drainage

The principal outlets for water from the Plan area are to the River Parrett at the Westonzoyland Pump Station and to the King's Sedgemoor Drain via Chedzoy New Cut (the downstream section of the Penzoy River). It is also possible to discharge water from Southlake Moor to the Sowy via Aller Drove Inlet and, from 2009, through the recently constructed Southlake Inlet.

Water levels are lowered in winter months to allow better drainage and to reduce the risk of overland flooding. However, most watercourses still retain a pen level in winter to maintain the conservation interests and reduce frost damage and erosion of banks.

The Act of 1830 (An Act for Draining, Flooding and Improving certain low Lands and Grounds within the several parishes of Othery, Middlezoy and Westonzoyland in the County of Somerset) permitted the Othery, Middlezoy and Westonzoyland Drainage Board to flood areas within its district between 15 December and 1 March. Under the Act of 1830, winter flooding of Southlake was undertaken to provide agricultural benefits, by introducing sediment and nutrients from the River Parrett. Flood levels on the moor would then be maintained for several weeks to allow sediment to settle on the land, to consolidate field surfaces and to insulate soils from frost.

Winter flooding on Southlake used to be achieved by opening the large sluice door in the right bank of the Parrett (Southlake Inlet) during flood events, which would allow the moor to fill up within 48 hours. This system is no longer safe to operate and has been replaced by the Southlake Inlet from the Sowy.

There is currently a 43 ha Raised Water Level Area (RWLA) in the centre of Southlake that uses bunds and stop-log structures to maintain high pen levels in the winter months. The WLMP

includes proposals to decommission the RWLA and instead, utilise the main control structures to allow flood water on to Southlake from the Sowy in December and January. This change in water level management will provide more appropriate conditions in the centre of the moor and a safe roost site for wintering birds.

During the summer months, the emphasis changes from drainage to irrigation, except during periods of heavy rainfall, when there is a risk of flooding. From early April to the end of November, sluice gates or penning boards are generally operated to raise water levels in the rhynes and ditches to higher levels. The higher summer levels are required to:

a) Provide wet fences around the fields and the watering of livestock;
b) Maintain an appropriate groundwater table during the growing season;
c) Maintain the conservation interest of the watercourses.
d)

## 3.4. Asset management systems

The Environment Agency Flood Risk Management (FRM) department manages its assets using a "System" approach introduced in 2005. An FRM System is defined as: "*A group of assets that work together to reduce the flood risk to the people, infrastructure and environment within the system*". Each FRM System has its own specific Management Plan, which describes the system and its management.

There are two FRM Systems which geographically cover the Othery, Middlezoy, Westonzoyland and Chedzoy WLMP area:

- FR14S024 Kings Sedgemoor Drain (High Environmental)
- FR14S027 Parrett Penzoy (High Environmental)

Each Environment Agency owned asset is listed in the National Flood and Coastal Defence Database (NFCDD). This provides a definitive store for all data on flood and coastal defences. It records inspections, identifies asset condition, residual life and recommends any works required and their urgency. Performance specifications are given to each System and to the individual assets, to guide maintenance standards. The maintenance works are then carried out by Operations Delivery. This process is used to direct the highest standards of maintenance to where they are most needed, using a risk based approach.

The Parrett IDB manages its assets in the Plan area under a comparable management system.

## 3.5. The strategic context for water management

There are a number of strategic plans and documents which provide the context for this Water Level Management Plan, including:

- *The River Parrett Catchment Flood Management Plan* – the final Plan will be available in due course.
- *Catchment Abstraction Management Strategies (CAMS)* – These documents are currently being revised for re-release in 2011.

### 3.5.1. Catchment Flood Management Plan

The Catchment Flood Management Plan (CFMP) for the River Parrett provides an overview of flood risk management in the catchment for the next 100 years. The Plan will be reviewed every six years. The CFMP is intended to guide flood risk management (FRM) investment in the catchment by the Environment Agency and other bodies with FRM responsibilities and powers.

The Environment Agency proposes to adopt Policy Option 6 for the floodplains of the Parrett catchment. This would involve the Environment Agency, and others, taking action to increase the frequency of flooding. It appears that by redistributing floodwater - primarily from upstream of Langport to the King's Sedgemoor Drain, the overall damage and disruption from flooding will be reduced. Work will also be required to maintain the safety of existing embankments and infrastructure.

### 3.5.2. Catchment Abstraction Management Strategy (CAMS)

To ensure water resources are managed in a sustainable way the Environment Agency has developed Catchment Abstraction Management Strategies (CAMS) to assess the water availability in catchments in England and Wales. The Parrett CAMS, published in March 2006 and the Brue, Axe and North Somerset Streams CAMS, published in May 2006 are the current documents in circulation. However, these do not cover the Levels and Moors as the water availability assessment can only be used on flowing rivers, rather than those which are managed by control structures. However, as part of the Environment Agency's future CAMS, the current CAMS will be reassessed and the impact of the Somerset Levels and Moors will be included. There are two new documents which are in the process of being written, and will be completed by February 2011; they are:

- Parrett, Brue and West Somerset Streams CAMS (PBWSS)
- Bristol Avon, Little Avon, Axe and North Somerset Streams CAMS (BALAANSS)

Whilst the majority of the Somerset Levels and Moors will be covered in the PBWSS, there are some areas that affect the River Axe and so are covered in the BALAANSS.

The aim is to set an appropriate abstraction licensing policy for those rivers that are influenced by the inlets and pumping stations that control water levels within the Moors. The new CAMS will not assess or change the water levels held across the Levels and Moors. Instead, they will assume that the water levels stated in the Water Level Management Plans are appropriate. They will use the information held within the WLMPs to determine how much water will be taken from and pumped into the Main River carriers that flow through the Levels and Moors (e.g. River Parrett). The Strategy will assess if these water inputs/outputs have the potential to compromise the ecology within these Main River carriers. If the Strategy identifies there is surplus water available in the catchment, then it will also consider how much of this water is available for new abstraction licences from the rivers.

## 3.6. Watercourses

### 3.6.1. Main Rivers

The Environment Agency has permissive powers to manage designated Main Rivers to reduce the risk of flooding of property and risk to human life. There are eight Main Rivers within the Plan area: the Penzoy River, Burrow Wall Rhyne, Southlake Engine Rhyne, Westonzoyland Engine Rhyne, the River Parrett, Sowy River and the Chedzoy New Cut. These rivers are summarised in Table 1. The extent and locations of the Main Rivers are illustrated on Map 2. The control structures on these watercourses are listed in Tables 2 - 5.

### 3.6.2. IDB watercourses

The Parrett IDB maintains and controls a network of watercourses (known as “Viewed Rhynes”) within the Plan area which drain into the Main Rivers. These key watercourses extend to over 27 kilometres. Summary details of the Viewed Rhynes maintained by the Parrett IDB are set out in Table 1. The locations of the Viewed Rhynes are shown on Map 2. The control structures on these watercourses are listed in Tables 2 – 5.

### 3.6.3. Private ditches

In addition to the Main Rivers and Viewed Rhynes, private ditches occur throughout the Plan area and are maintained by the riparian owner. This network of ditches is an integral part of the drainage and water supply network in the Plan area. They are particularly important as wet fences, to supply drinking water for grazing animals and support a substantial part of the overall biodiversity interest of the Plan area.

## Table 1: Schedule of arterial watercourses in Othery, Middlezoy, Westonzoyland and Chedzoy

| Asset No. | Watercourse | Operating Authority | Length (m) | Location & connections | Current maintenance regime | Control structures (see Tables 2 - 5) |
|---|---|---|---|---|---|---|
| NFCDD 8642 | Penzoy River (Various sections upstream are known by the following names: Aller Drove Rhyne, Challis Wall Rhyne, Southlake Rhyne | EA | 9800 | Enmained south of Pathe, adjacent to Burrow Wall Rhyne, and runs in a consistently north westerly direction through Southlake Moor, Earlake Moor, the Western Levels, north under Penzoy Bridge and into the Chedzoy New Cut to eventually drain into the King's Sedgemoor Drain. | Various sections are flailed, then the banks are cut twice through June to September to various specifications – W2, W3 & W4 | Aller Drove Inlet Sluice,<br>Challis Wall Upper Sluice,<br>Challis Wall Lower Sluice,<br>Penning Structures S1, S2 & S3,<br>Southlake Sluice,<br>A361 Sluice,<br>Hembrow's Penning Bay,<br>Shepherds Drove Tilting Weir,<br>Lake Wall Flap Gate,<br>Chedzoy Clyse Tilting Weir,<br>Chedzoy Clyse Flap Gate,<br>Pathe Penning Boards,<br>Pathe Sluice, |
| NFCDD 8643 | Burrow Wall Rhyne | EA | 1620 | Enmained south of Pathe and runs in north-westerly direction to the A361 Sluice as the northern boundary of Southlake Moor. | Left Bank flailed and cut once as required during August/September to specification W3 | Langford's Entrance Sluice,<br>Westonzoyland Pumping Station |
| NFCDD 8641 | Southlake Engine Rhyne | EA | 2200 | Enmained partway along Burrow Hill Drove runs westerly, then southwest to the old Pumping Station on the R. Parrett. | Banks are flailed and then cut twice in June and July to specification W3. | Southlake Inlet |
| NFCDD 8613 | Westonzoyland Engine Rhyne | EA | 1000 | Enmained from Western Drove runs in a southwest direction to Westonzoyland Pumping Station. | Both banks are flailed and then cut as required in September to specification W2. | Beer Wall Tilting Weir |
| NFCDD 8550 | River Parrett | EA | 6000 approx | Forms the southern and western boundary of the Plan area from Stathe to Haymoor. | Raised bank is flailed annually in late summer to specification F2 (FB), no weed is cut in the channel. | |
| NFCDD 8661 | Sowy River | EA | 1000 approx | Forms the south eastern boundary of Southlake Moor. | Single weed cut is carried out in September to specification W3 | |
| NFCDD 8612 | Chedzoy New Cut | EA | 4200 | Main River from the junction of Port Wall and Park Wall Droves, flows south then east into the King's Sedgemoor Drain. | A single weed cut is carried out between July and September to specifications W2 & W3 | Chedzoy Clyse<br>Rugg's Drove Tilting Weir<br>Longacre Drove Bay<br>Ashford's Sluice<br>Park Wall Tilting Weir |

## Table 1 (continued): Schedule of arterial watercourses in Othery, Middlezoy, Westonzoyland and Chedzoy

| Asset No. | Watercourse | Operating Authority | Length (m) | Location & connections | Current maintenance regime | Control structures (see Tables 2 - 5) |
|---|---|---|---|---|---|---|
| 1 | Little Burrow Drove | IDB | 396 | Runs east along the south side of the east end of Little Burrow Drove from the Penzoy River to Palmers Hern Rhyne. | W1 | None |
| 2 | Palmers Hern Rhyne & Branch | IDB | 1713 | Runs from Little Burrow Drove in a northerly direction for ~700m, then turns west for 300m (at which point the watercourse becomes New Way Rhyne) | W2 | Palmers Hern Penning Boards - Stop-logs |
| 3 | Greyway Rhyne | IDB | 1192 | Runs from New Way Rhyne in an easterly direction for ~1km (to Nether Moor) where it joins Greenway Rhyne. | W1 | None |
| 4 | Greenway Rhyne & Branch | IDB | 1553 | Runs north along the west side of Nethermoor Drove to the outskirts of Middlezoy village. The Branch runs southeast towards Othery. | W2 | None |
| 5 | New Way Rhyne | IDB | 828 | This watercourse takes a zigzag course from Palmers Hern Rhyne in a northwest direction towards the corner in Shepherds Drove (and Shepherds Drove Rhyne), where it turns northeast towards Middlezoy village. Not the whole length of New Way Rhyne is in view. | W2 | None |
| 6 | Yeomead Rhyne | IDB | 2303 | This watercourse runs SE from near Moorland House Farm towards Shepherds Drove. It runs along the north side of the road for ~300m, then turns north towards Willake Drove. It runs along the west side of the drove for ~300m, and then turns towards the Penzoy River. | W1 | None |
| 7 | Damas Drove Rhyne | IDB | 788 | This watercourse runs from the Penzoy River along the south side of Damas Drove for 150m, then turns southeast for one field length and then northeast, where it crosses Place Drove and joins Pig Ditch. | W2 | None |
| 8 | Knowle Hill Rhyne & Branch | IDB | 1269 | Runs approximately parallel to Langmead Rhyne, some 400 metres (440 yards) to the south. The branch continues to the southeast extremity of the area. | W1 | None |
| 10 | Little Drove Rhyne & Pig Ditch (Pt) | IDB | 1467 | Little Drove Rhyne runs northeast along the north side of Little Drove from the Penzoy River, across Place Drove and joins Pig Ditch. | W2 | None |
| 11 | Middle Drove Rhyne | IDB | 1340 | Runs northeast from the Penzoy River (opposite its connection with the Hamlawn Rhyne branch) for a distance of ~630 metres (690 yards). It then turns southeast for ~240 metres (260 yards) towards Middle Drove. It then turns northeast, along the south side of Middle Drove, across Place Drove and connects with Pig Ditch. | W2 | None |

## Table 1 (continued): Schedule of arterial watercourses in Othery, Middlezoy, Westonzoyland and Chedzoy

| Asset No. | Watercourse | Operating Authority | Length (m) | Location & connections | Current maintenance regime | Control structures (see Tables 2 - 5) |
|---|---|---|---|---|---|---|
| 12 | Lake Wall Rhynes | IDB | 628 | These are two short rhynes to the northwest of Westonzoyland Engine Rhyne, one running northwest towards near Lake Wall Farm, and the other running northwest for one field length and then southeast. | W1 | None |
| 13 | First Shave Rhyne | IDB | 461 | This is a short rhyne which runs northeast from the northern end of Pig Ditch towards Shave Drove, and then turns northwest, where it runs along the southwest side of Shave Drove for about 80m. | W2 | None |
| 14 | Second Shave Rhyne | IDB | 326 | Runs northeast from Pig Ditch towards Shave Drove, then runs northwest along Shave Drove for ~90m. | W1 | None |
| 15 | Pig Ditch (Part) | IDB | 483 | Runs from south east to north west, from the outskirts of Middlezoy to the outskirts of Westonzoyland, roughly parallel to Place Drove one field's depth north east of the road. | W1 | None |
| 16 | Pig Ditch (Part) | IDB | 841 | | W1 | None |
| 17 | Short Rhyne | IDB | 409 | This is a branch on the north side, approximately half way between the Penzoy River and Place Drove which runs in a northerly direction for 250m and then NE for a further 100m | W1 | None |
| 18 | Inlet Rhyne & Shepherds Drove Rhyne | IDB | 2292 | Runs north west from the Penzoy River (at Little Burrow Drove) towards Shepherds Drove, where it joins Shepherds Drove Rhyne. A short branch runs from close to where it joins the Penzoy River, in a westerly direction for 200m and then turns south towards the A361 adjacent to Burrow Mump. | W2 | Fixed weir<br>Inlet Rhyne Weir & Shepherd's Drove Tilting Weir |
| 19 | Hamlawn Rhyne | IDB | 1902 | Runs along the south east boundary of Weston Level from Little Drove Rhyne to the southern extremity of the area. The branches cross it perpendicularly and connect it with Penzoy River to the north east, and continue south west outside the area. | W2 | None |
| 20 | Garstons Rhyne | IDB | 209 | Short section to the north east of Greenway Rhyne, south east of Middlezoy. | W1 | None |

## Table 1 (continued): Schedule of arterial watercourses in Othery, Middlezoy, Westonzoyland and Chedzoy

| Asset No. | Watercourse | Operating Authority | Length (m) | Location & connections | Current maintenance regime | Control structures (see Tables 2 - 5) |
|---|---|---|---|---|---|---|
| S1 | Burrow Hill Drove Rhyne | IDB | 405 | The viewed section runs in a westerly direction as far as the Penzoy River. | W3 | None |
| S2 | Black Drove Rhyne | IDB | 1610 | Runs from east to west, across the centre of Southlake, from Chantry Rhyne, along the north side of Black Drove, then in a westward direction at the end of Black Drove to a connection with the Old Pump Channel (Main River). | W3 | NRV4 – RWLA structure at Eastern end |
| S3 | Chantry Rhyne | IDB | 780 | Runs from the Penzoy River at Straight Drove, in an easterly, then a northerly direction to Chantry Drove, where it runs along the north side of the Drove to Burrow Hill Drove, where it runs into the small section of Burrow Hill Drove Rhyne which is not Main River. | W3 | None |
| S4 | Moons Drove Rhyne | IDB | 474 | Runs from the junction of Tapping Wall Drove Rhyne and Slab Drove Rhyne in a westerly direction along the north side of Moons Drove to a connection with the Old Pump Channel ~150 metres east of the former pumping station. | W2 | None |
| S5 | Cross Rhyne | IDB | 136 | Part of this watercourse runs south from Tapping Wall Drove Rhyne to River Grounds Rhyne (private watercourse). An extension (private watercourse) connects this rhyne with the Flooding Hatch. | W2 | None |
| S6 | Tapping Wall Drove Rhyne | IDB | 900 | Runs west from Straight Drove Rhyne along the south side of Tapping Wall Drove as far as Moons Drove, | W3 | None |
| S7 | Straight Drove Rhyne | IDB | 662 | Runs from the Penzoy River, along the east side of Straight Drove Rhyne in a southerly direction as far as tapping Wall Drove. | W3 | NRV8a – RWLA structure at NE end |
| S8 | Slab Drove Rhyne | IDB | 210 | Runs north along the west side of Slab Drove to a connection with Black Drove Rhyne. | W2 | None |

## 3.7. Structures

### 3.7.1. Structures controlling inflows

In addition to rainfall, a number of structures are currently operated to supply water to the Plan area, as set out in Table 2. Proposed changes to these arrangements are set out in Section 9.

**Table 2: Structures controlling inflows to Othery, Middlezoy, Westonzoyland and Chedzoy**

| Asset No. NFCDD | Inlet | Grid Ref. | Owned by | Operated by |
|---|---|---|---|---|
| 1122586610105 L03001 | Aller Drove (Inlet) Sluice (from the Sowy River into the Penzoy River) | ST 3810 3035 | EA | EA |
| 1122586420101 B06001 | Challis Wall Sluices (Penzoy River through Southlake Moor) | ST 3778 3022 | EA | EA |
| 1122586810101 L01002 | Chedzoy Inlet (Penstock on the Langacre) | ST 3799 3493 | EA | EA / IDB |
| OM003 | Southlake Inlet (from the Sowy River into the Penzoy River) | ST 3792 3015 | IDB | IDB |

### 3.7.2. Structures controlling outflows

A number of structures are currently operated to control the water leaving the Plan area, as set out in Table 3. Any proposed changes to these arrangements are set out in Section 9.

**Table 3: Structures controlling outflows from Othery, Middlezoy, Westonzoyland and Chedzoy**

| Asset No. NFCDD | Outfall | Grid Ref. | Owned by | Operated by |
|---|---|---|---|---|
| 1122586120101 B01001 | Chedzoy Clyce (into the King's Sedgemoor Drain): | ST 3570 3650 | EA | EA |
| 1122586610101 L01001 | Sedgemoor Drove Rhyne Outfall (Siphon under the Sowy) | ST 3792 3495 | EA | EA |
| 1122586130101 B01001 | Westonzoyland Pumping Station (into the River Parrett): | ST 3396 3281 | EA | EA |

### 3.7.3. Structures controlling water levels within the area

Water levels within the Plan area are currently controlled by numerous structures located on the network of arterial watercourses. These are summarised in Table 4. Any proposed changes to these arrangements are set out in Section 9.

## Table 4: Structures controlling water levels within Othery, Middlezoy, Westonzoyland and Chedzoy

| Asset No. NFCDD (IDB) | Water level control structure | Grid Ref. | Owned by | Operated by | Summer level (m AOD) | Winter level (m AOD) |
|---|---|---|---|---|---|---|
| 1122586420101 B06001 | Challis Wall Upper Sluice: Watercourse: Challis Wall Rhyne / Penzoy in Southlake | ST 3778 3022 | EA | EA | ~3.95 | 3.60 |
| 1122586420101 B06001 | Challis Wall Lower Sluice: Watercourse: Challis Wall Rhyne / Penzoy in Southlake | ST 3778 3022 | EA | EA | Closed | Closed |
| 1122586420101 B05001 | Penning Structure S1: Watercourse: Penzoy in Southlake | ST 3745 3008 | EA | EA | 3.65 | 4.00 |
| 1122586420101 B03014 | Penning Structure S2: Watercourse: Penzoy in Southlake | ST 3739 3003 | EA | EA | 3.65 | 4.00 |
| 1122586420101 B03001 | Penning Structure S3: Watercourse: Penzoy in Southlake | ST 3668 3032 | EA | EA | 3.65 | 3.85 |
| 1122586420101 B01001 | Southlake Sluice: Watercourse: Parrett | ST 3642 3064 | EA | EA | 3.65 | ~3.40 |
| 1122586430101 B02001 | A361 Sluice : Watercourse: Burrow Wall Rhyne | ST 3620 3062 | EA | EA | 3.65 | 3.40 |
| 1122586110104 B01009 | Hembrow's Penning Bay: Watercourse: Penzoy | ST 3645 3112 | EA | IDB | 3.30 – 3.50 | Not penned |
| 1122586110103 B05022 | Shepherds Drove Tilting Weir: Watercourse: Penzoy | ST 3593 3175 | EA | EA | 2.86 | Not penned |
| 1122586110103 B01001 | Lake Wall Flap Gate: Watercourse: Penzoy | ST 3441 3384 | EA | EA | Not penned | Not penned |
| 1122586120101 B01001 | Chedzoy Clyse Tilting Weir: Watercourse: Chedzoy New Cut | ST 3576 3650 | EA | EA | 2.64 | Not penned |
| 1122585910101 B01003 | Dunball Sluice Watercourse: King's Sedgemoor Drain | ST 3090 4071 | EA | EA | 2.44 | 2.13 |
| 1122586430103 B01003 | Pathe Penning Boards: Watercourse: Burrow Wall Rhyne | ST 3772 3049 | EA | EA | 4.00 | 3.80 – 3.85 |
| 1122586430103 B01003 | Pathe Sluice: Watercourse: Burrow Wall Rhyne | ST 3773 3049 | EA | EA | 4.00 | 3.80 – 3.85 |
| 1122586430102 B01003 | Langford's Entrance Sluice: Watercourse: Burrow Wall Rhyne | ST 364 306 | EA | EA | 4.00 | 3.80 – 3.85 |
| 1122586130101 B01001 | Westonzoyland Pumping Station: Watercourse: Westonzoyland Engine Rhyne - Parrett | ST 3396 3281 | EA | EA | 2.74 | 2.50 |
| 1122586610102 B01001 | Beer Wall Tilting Weir: Watercourse: Sowy | ST 3918 3154 | EA | EA | 4.00 | 2.20 – 2.30 |
| 1122586120102 B04001 | Rugg's Drove Tilting Weir; Watercourse: Chedzoy New Cut | ST 334 3624 | EA | EA | Not penned | Not penned |
| 1122586610101 L01001 | Sedgemoor Drove Rhyne Outfall: Watercourse: Sedgemoor Drove Rhyne | ST 3792 3495 | EA | EA | Not penned | Not penned |
| 1122586120103 B01001 | Ashford's Sluice: Watercourse: Chedzoy New Cut | ST 3276 3662 | EA | EA | ~4.00 | Not penned |
| 1122586120103 R02001 | Park Wall Tilting Weir: Watercourse: Parkwall Rhyne | ST 3275 3682 | EA | EA | Not penned | Not penned |
| OM001 | Inlet Rhyne Bay | ST 3612 3076 | IDB | IDB | Penned (level unknown) | Not penned |
| OM002 | Palmers Hern Boards | ST 3682 3152 | IDB | IDB | Penned (level unknown) | Not penned |
| OM003 | Southlake Inlet | ST 3792 3015 | IDB | IDB | ~3.95 | 3.60 |
| OM004 | Southlake Isolation Structure | ST 3786 3033 | IDB | IDB | Closed | Closed |

## Table 5: Schedule of control structures affecting water management in Othery, Middlezoy, Westonzoyland and Chedzoy

| Asset No. NFCDD (IDB) | Control Structure | Grid Ref. | Owned by | Operated by | Rhyne or Main River (Table 1) | Description (function) | Dimensions & operating range | Summer operation | Winter operation | Flood operation |
|---|---|---|---|---|---|---|---|---|---|---|
| 112258661010 5L03001 | Aller Drove Inlet Sluice | ST 3809 3037 | EA | EA | Sowy/Penzoy River | Sluice penstock & boards | Crest level 5.19 controls flow between Penzoy & Sowy | Open | Open + boards | Closed |
| 112258642010 1B06001 | Challis Wall Upper Sluice | ST 3778 3022 | EA | EA | Penzoy River | Weir penstock | 600 x 600<br>Invert level 3.50m | Penning | Penning | Closed |
| 112258642010 1B06001 | Challis Wall Lower Sluice | ST 3778 3022 | EA | EA | Penzoy River | Sluice penstock | 1100 x 1100<br>Invert level 2.40m | Closed | Closed | Closed |
| 112258642010 1B05001 | Penning Structure S1 | ST 3745 3008 | EA | EA | Penzoy River | Stop-logs | RWLA summer and winter pen with gauge board | Open, no stop-logs | Penning with stop-logs | No action |
| 112258642010 1B03014 | Penning Structure S2 | ST 3739 3003 | EA | EA | Penzoy River | Stop-logs | RWLA summer and winter pen with gauge board | Open, no stop-logs | Penning with stop-logs | No action |
| 112258642010 1B03001 | Penning Structure S3 | ST 3668 3032 | EA | EA | Penzoy River | Stop-logs | RWLA summer and winter pen with gauge board | Open, no stop-logs | Penning with stop-logs | No action |
| 112258642010 1B01001 | Southlake Sluice | ST 3642 3064 | EA | EA | Penzoy River | New tilting weir | Approximately 1000 x 1000 weir gate | Raised | Raised | Lowered |
| 112258643010 1B02001 | A361 Sluice | ST 3620 3062 | EA | EA | Penzoy River | New adjustable weir penstock | 800mm wide vertical lifting and older penstock | Raised | Lowered | Open |
| 112258611010 4B01009 | Hembrow's Penning Bay | ST 3645 3112 | EA | IDB | Penzoy River | Stop-logs | 2 x 1.25m penning bays | Penning with stop-logs | Open, no stop-logs | Open, no stop-logs |
| 112258611010 3B05022 | Shepherds Drove Tilting Weir | ST 3593 3175 | EA | EA | Penzoy River | Tilting weir | 1.2m wide tilting weir | Raised to provide pen level | Not penned | Not penned |
| 112258611010 3B01001 | Lake Wall Flap Gate | ST 3441 3384 | EA | EA | Penzoy River | Flap gate, new access | 3.2 x 2.6 steel flap operated by a winch | Part open | Part open | Part open |
| 112258612010 3B01001 | Ashford's Sluice | ST 3276 3662 | EA | EA | Chedzoy New Cut | Sluice penstock | 1.15m x 1.5m sluice gate and weir | Penning | Open, no pen | Open |
| 112258612010 3R02001 | Park Wall Tilting Weir | ST 3275 3683 | EA | EA | Chedzoy New Cut | Tilting weir | 2m wide tilting weir on a culvert under Park Wall Drove | Not operated Open | Not operated Open | No action Disused |
| 112258612010 1B01001 | Chedzoy Clyse Tilting Weir | ST 3576 3650 | EA | EA | Chedzoy New Cut | Tilting weir | 3.05m wide tilting weir | Raised to provide pen level | Not penned | Not penned |
| 112258612010 1B01001 | Chedzoy Clyse Flap Gate (Chedzoy Outlet) | ST 3576 3650 | EA | EA | Chedzoy New Cut | Flap gate | 3.05m wide x 1.83m high timber gate | Closed | Open | No action. Open if levels allow |
| 112258612010 2B04001 | Rugg's Drove Tilting Weir | ST 3348 3624 | EA | EA | Chedzoy New Cut | Tilting weir | 2m wide tilting weir on a culvert going under Rugg's Drove | Not operated | Not operated | No action |

**Table 5 (continued): Schedule of control structures affecting water management in Othery, Middlezoy, Westonzoyland and Chedzoy**

| Asset No. NFCDD (IDB) | Control Structure | Grid Ref. | Owned by | Operated by | Rhyne or Main River (Table 1) | Description (function) | Dimensions & operating range | Summer operation | Winter operation | Flood operation |
|---|---|---|---|---|---|---|---|---|---|---|
| 112258681010 1L01002 | Chedzoy Inlet | ST 3792 3495 | EA | IDB | Sedgemoor Drove Rhyne | Penstock | Penstock and Siphon under the Sowy fed from the Langacre | Partly open | Closed | No action |
| 112258661010 1L01001 | Sedgemoor Drove Rhyne Outfall | ST 3792 3495 | EA | EA/IDB | Sedgemoor Drove Rhyne | Stop-logs on the end of a siphon | 0.6m diameter pipe with 1.2m penning capability | Not normally operated Closed | Not normally operated Closed | No action |
| 112258643010 3B01003 | Pathe Penning Boards | ST 3772 3049 | EA | EA | Burrow Wall Rhyne | Stop-logs | Mounted stop-log frame in front of the penstock, not operated at present | Open, no stop-logs | Open, no stop-logs | No action |
| 112258643010 3B01003 | Pathe Sluice | ST 3773 3049 | EA | EA | Burrow Wall Rhyne | Sluice penstock | 0.6 x 0.6m sluice, not operated at present | Open | Open | No action |
| 112258643010 2B01003 | Langford's Entrance Sluice | ST 3640 3060 | EA | EA | Burrow Wall Rhyne | Sluice penstock | 3.05m diameter vertical sluice gate, not operated at present | Open | Open | No action |
| 112258613010 1B01001 | Westonzoyland Pumping Station | ST 3396 3281 | EA | EA | Westonzoyland Engine Rhyne | Pumping station | 1x 24 inch centrifugal pump diesel drive | Operates when required | Operates when required | Operates when required |
| 112258661010 2B01001 | Beer Wall Tilting Weir | ST 3918 3153 | EA | EA | Sowy River | Tilting weir | 3m wide electrically operated tilting weir | Raised to provide pen level | Not penned | Not penned |
| 112258591010 1B01003 | Dunball Sluice (external) | ST 3099 4072 | EA | EA | King's Sedgemoor Drain | Tilting weirs, vertical doors tide flaps | Total structure is 23.95m wide. It has four main openings (4m wide), and two culverts. Each opening is fitted with two vertical lifting gates (4.26m wide x 3.04m high) and a tidal flap. On the inlet to each channel there is a tilting weir and a penstock, and a flap on the outfall. Total river width at Dunball is 25.78m | Penning | Penning | Open |
| 112258550030 1R02001 | Southlake Inlet | ST 3660 2950 | EA | IDB | River Parrett | Penstock | 1.8m sluice gate into a 1.1m x 15m Armco pipe - Disused | Closed | Closed | Closed |
| OM001 | Inlet Rhyne Bay | ST 3612 3076 | IDB | IDB | Inlet Rhyne & Shepherds Drove Rhyne | Fixed weir | Reinforced concrete slab set into bed of rhyne | Pens with fixed weir | Pens with fixed weir | No action |
| OM002 | Palmers Hern Boards | ST 3682 3152 | IDB | IDB | Palmers Hern Rhyne & Branch | Stop-logs | Reinforced concrete slab with slots for penning boards | Penning with stop-logs | Open, no stop-logs | No action |

Note: There are a number of small structures located within Southlake Moor that the Environment Agency have constructed to support a Raised Water Level Area Scheme (RWLA). This new Water Level Management Plan makes the RWLA structures redundant, and the Parrett IDB proposes these structures are decommissioned. The Environment Agency has provided guidance to the IDB on an appropriate decommissioning process, and ownership of structures in scheme that are not removed would pass to IDB.

### 3.7.4. Gauge boards

The known gauge boards within the Othery, Middlezoy, Westonzoyland and Chedzoy area are summarised in Table 6. All gauge boards are metric and levelled to metres Above Ordnance Datum (m AOD).

**Table 6: Gauge boards operated in Othery, Middlezoy, Westonzoyland and Chedzoy**

| Location of gauge board | Grid Reference | Notes | Operator |
|---|---|---|---|
| 1. PENZOY RIVER<br>– Aller Drove Inlet Sluice<br>– Penning Structure S1<br>– Penning Structure S2<br>– Penning Structure S3<br>– Southlake Sluice<br>– A361 Structure<br>– Hembrow's Penning Bay<br>– Shepherds Drove TW<br>– Lake Wall<br>– Chedzoy Clyse<br>– Challis Wall Sluices | <br>ST 3809 3037<br>ST 3745 3008<br>ST 3740 3003<br>ST 3670 3032<br>ST 3642 3064<br>ST 3620 3062<br>ST 3642 3112<br>ST 3593 3175<br>ST 3441 3384<br>ST 3576 3650<br>ST 3778 3021 | <br>u-s & d-s – new<br>d-s<br>d-s<br>u-s<br>u-s - new<br>u-s<br>u-s – NOT USED<br>u-s – new<br>u-s – new<br>u-s – new<br>d-s - new | All EA |
| 2. WESTONZOYLAND ENGINE RHYNE<br>– Westonzoyland Pumping Station | ST 3396 3280 | u-s | EA |
| 3. SOWY RIVER<br>– Beer Wall | ST 3918 3152 | u-s & d-s - new | EA |
| 4. RIVER PARRETT<br>– Burrow Bridge | ST 3574 3043 | u-s & d-s – NOT USED | EA |

Note: Gauge boards at Penning Structures S1, S2 and S3 will be removed when the RWLA is decommissioned.

### 3.7.5. Water level telemetry

The Environment Agency has a network of telemetry sites installed at key control structures within the Plan area, including Dunball Sluice on the King's Sedgemoor Drain, Beer Wall Tilting Weir on the Sowy and Westonzoyland Pumping Station on the Westonzoyland Engine Rhyne. Water levels are remotely monitored at these sites and a series of alarms alert staff when water levels go outside of the agreed summer and winter level range. Alarms are received 24 hours a day, seven days a week by the National Incident Communication Service. The alarms are then passed on immediately to the most appropriate duty officer in the local area.

## 3.8. Abstraction and other hydrological management issues

There are no known significant ongoing water resource issues which directly influence or are influenced by water level management within this catchment.

The Water Act (2003) has introduced a new statutory framework for managing water resources. Under the Act the abstraction of up to and including 20 cubic metres per day (approximately 4,400 gallons per day) from surface water or groundwater does not require a licence from the Environment Agency regardless of the purpose for which the abstracted water will be used. Abstractions above 20 cubic metres per day require a licence, issued by the Environment Agency. The Water Act (2003) also removes a range of exempt activities that currently do not require an abstraction or transfer licence. However, this section of the legislation has not yet

been enacted (see the EA website for further information on licensing requirements under the Water Act (2003)).

The Environment Agency will consult the Parrett IDB and Natural England regarding its consideration of applications for an abstraction licence.

There are currently no abstractions directly within the SSSIs, although there is one Licence within the Plan area as listed in Table 7. There is also one Licence downstream of the Plan area which may be affected by the flow in the Penzoy River upstream (16/52/008/S/118).

**Table 7: Abstraction licences in or near Othery, Middlezoy, Westonzoyland and Chedzoy**

| Licence No | Description | Point Name | Max Daily Vol. ($m^3$) | Max Annual Vol. ($m^3$) |
|---|---|---|---|---|
| 16/52/008/S/121 | Spray irrigation | Lower reaches of Penzoy River / Chedzoy New Cut (ST 35024 35457) | 400 | 16000 |
| 16/52/008/S/118 | Spray irrigation | Penzoy River (just upstream of Westonzonland Road over Penzoy Bridge) (ST 33835 34701) | 200 | 3000 |

## 3.9. Water quality

There have been 20 years of steady water quality improvements across the Somerset Levels and Moors catchments; however, phosphate levels remain a concern. There are some local water quality issues in the Plan area related to diffuse and point sources of pollution. Diffuse pollution is primarily caused by high phosphate levels from nutrient enrichment (fertilisers) and private septic tank overflows. Point sources of pollution mainly occur at sewage treatment works.

The Environment Agency and Natural England are currently developing 'Diffuse Water Pollution from Agriculture' plans that aim to reduce nutrient enrichment of watercourses and promote good agricultural practice through the Catchment Sensitive Farming Programme. The Environment Agency has also undertaken nutrient modelling to identify the relative importance of diffuse and point sources to nutrient enrichment in the catchment and is working with the water companies to reduce nutrient discharges from sewage treatment works.

Weed-cutting activities can also cause significant drops in dissolved oxygen (DO) levels on most watercourses. The Environment Agency's Operations Delivery team take DO readings before and during weed cutting to ensure water quality does not deteriorate rapidly. If DO levels drop below 20%, all operations stop immediately, including the operation of Pumping Stations, especially in summer. This practice helps to prevent fish kill and unnecessary damage to the aquatic environment.

It is illegal to discharge raw sewage or trade effluent directly into any controlled watercourse. Controlled discharge of treated effluent requires consent to discharge, which must be obtained from the Environment Agency. The Environment Agency should be informed of any water pollution problems, particularly septic tank discharges, to allow investigation and improvement. In the event of a pollution incident being noted, assistance should be sought immediately from the Environment Agency's incident pollution hotline on 0800 80 70 60.

# 4. Agriculture and other land uses

## 4.1. Agriculture

Agriculture is the important land use within the Plan area. Most of the land is divided into small fields which are separated mostly by watercourses or a combination of hedge and watercourse. The watercourses are used to provide drinking water for livestock and as wet fences. The Parrett IDB recognises the importance of agriculture within the Plan area and the key role that the effective management of water has to play in enabling this land use to prosper within the area. The Board also recognises that additional investment in the water management system will be required in the years to come in order to achieve the combined objectives of conservation and farming in the Plan area.

Livestock farming is the primary land use, with improved and semi-improved grassland used for grazing and for winter fodder covering about 70% of the farmed area. The remaining 30% of the farmed area is arable, often in mixed farms with livestock.

Food security, and the growing demand for quality food to supply the increasing population of the UK and elsewhere, is likely to stimulate additional investment in agriculture in the coming years. However, the Parrett IDB acknowledges that there is little opportunity to increase agricultural productivity within Southlake Moor SSSI or Langmead and Weston Level SSSI because of their importance for nature conservation, the risk of flooding and the vulnerability of peat soils.

## 4.2. Built development, services and transport

A number of domestic and rural properties in the Plan area are at risk of flooding, and lie within Flood Zone 3 (1 in 100 chance of flooding) as defined by the Environment Agency's Flood Map. These properties and the infrastructure that serves them, depend on effective flood protection and water level management in both Main Rivers and Viewed Rhynes. Low lying properties and minor roads (which provide essential transport links) would suffer from flooding or water-logging without the appropriate maintenance of flood defences, Main Rivers and IDB Viewed Rhynes. Most of the Plan area drains into the Penzoy and ultimately into the King's Sedgemoor Drain, and so the management of this Main River, and the operation of Dunball Sluice, is critical to flood risk management in the area.

The provision of adequate land for housing and employment is a national requirement and Local Planning Authorities are charged with ensuring that sufficient land is allocated through their new Local Development Frameworks. The Regional Spatial Strategy has identified Bridgwater as an area for future growth due to its status as a "Strategically Significant City or Town". However, the low lying nature of the Plan area, and its known risk of flooding, means that it is more vulnerable than others to the adverse effects of development.

Sedgemoor District Council consults the Environment Agency and the Parrett IDB on strategic plans, such as the new Local Development Frameworks, and on individual applications of significance. Planning Policy Statement 25 (PPS25, December 2006) sets out Government policy on development and flood risk. It aims to ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding, and to direct development away from areas of highest risk. In the exceptional cases where new development is necessary in areas of flood risk, the policy aims to make it safe, without increasing flood risk elsewhere. Where possible, developers are encouraged to work with the Planning Authority and the Drainage Authorities to use opportunities for new development to reduce flood risk overall.

## 4.3. Recreation

The Environment Agency has a role to create a quality of environment that people will be able to enjoy as well as a statutory duty to consider recreation on or near water. The vision is to conserve and improve the quality of the river environment whilst balancing recreational interests on the water (e.g. canoeists, rowers, anglers and boaters) and on banksides (e.g. cyclists, horse-riders, walkers and bird watchers).

The River Parrett Trail is a nationally recognised walk and draws a number of tourists to the area. This is expected to grow as demand for bankside, and recreation on the water, increases nationally each year.

## 4.4. Fisheries

The Environment Agency has a duty to maintain both freshwater and Eel fisheries, both of which play an important role in the wildlife interest of the Plan area. The fisheries are a major part of the wildlife interest especially Eels which are widely distributed and are the favourite food of Otters and a staple food of fish-eating birds. Any planned works to improve water level management may offer an opportunity to incorporate fisheries improvements and any new structures should allow for the free movement of Eels and Elvers. The Agency's fisheries officers can provide advice to ensure that fisheries are safeguarded and that the Agency's duty to fisheries is not prejudiced.

There are no commercial coarse fishing lakes in the Plan area although fishing does take place on the Penzoy River. Low water depth can reduce the numbers of species with the impact being more severe in cold weather. Normally this does not cause problems provided fish in the watercourse have access to deeper areas under critical conditions.

Some of the watercourses in the catchment area are dredged and weed-cut for flood risk management purposes. As these practices can disturb spawning fish, remove spawn or reduce cover for fry, the method and timing of weed cutting and dredging must be carefully considered to avoid these impacts. In some watercourses, in particular the Penzoy River, excessive build up of duckweed at penned structures can be a problem in summer that can result in de-oxygenation. Removal of this duckweed is difficult and is only effectively controlled by floating booms across the watercourse, which can help prevent complete coverage of the water surface.

# 5. Nature conservation and archaeology

## 5.1. Nature conservation interests

The Plan area contains:

a) An essential part of the largest area of lowland wet grassland remaining in England (the Somerset Levels and Moors), supporting an important assemblage of breeding waders and wetland birds, notably Snipe, Curlew, Redshank, Lapwing, Yellow Wagtail and Whinchat.

b) Part of a large wetland of international importance for its overwintering and migratory populations of waterfowl, and in particular Bewick's Swan, Golden Plover, Teal and Lapwing.

c) Part of a large wetland of international importance for its outstanding assemblage of rare invertebrates, particularly water beetles.

d) Part of a wetland of national importance for:

- Botanically rich, unimproved wet meadows and mires
- Ditch flora, including species which are nationally scarce, and relict fen species on ditch banks
- Ditch fauna, including species which are nationally rare or scarce
- Meadow fauna, including species which are nationally rare or scarce.
- Breeding wetland birds, such as Sedge and Reed Warblers

The Plan area includes:

a) Southlake Moor Site of Special Scientific Interest (196 ha) designated in 1985 under the Wildlife and Countryside Act 1981.

b) Langmead and Weston Level Site of Special Scientific Interest (168 ha) designated in 1991 under the Wildlife and Countryside Act 1981.

c) Southlake Moor SSSI is part of the Somerset Levels and Moors "Special Protection Area" which was designated under the European Community's Directive on the Conservation of Wild Birds in June 1997. It is also part of the Somerset Levels and Moors Wetland of International Importance, and the Government designated it as such under the terms of the Ramsar Convention in June 1997.

d) Part of the Somerset Levels National Nature Reserve, owned by Natural England on Southlake Moor.

e) Weston Level County Wildlife Site (ST33/013) consisting of unimproved wet grassland with species-rich rhynes.

The locations of the nature conservation sites are shown on Map 5.

**Box 2: Favourable condition for wetland SSSIs in Somerset**

An SSSI is considered to be in favourable condition when the special habitats and features of an SSSI are in a healthy state and are being conserved for the future by appropriate management. The Government's Public Service Agreement with DEFRA requires that 95% of all nationally important wildlife sites (SSSIs) are in a favourable (or unfavourable recovering) condition by the end of 2010.

**Water management requirements for wetland SSSIs in Somerset**

The following information summarises Natural England's advice to the Parrett IDB on the water management requirements needed for wetland SSSIs in Somerset to achieve favourable condition.

**For ditch and grassland interests in winter:**

- At least 30cm of water in the bottom of rhynes and ditches except in those around the margins of the SSSI where the ground levels are slightly higher.
- Summer water level at not more than 30cm below mean field level from 1 April to 30 November.

**For wintering birds:**

In early winter (from mid November):

- Gradual rising water levels to create extensive pools providing surface water covering 20 to 50% of the majority of fields with the lowest lying fields being close to 50%.

In mid winter (1 December to 28 February):

- Extensive areas of splashy conditions and shallow pools up to 25cm deep covering at least 50% of the majority of the fields;
- Deeper water roosts of at least 60ha, with water 25 to 75cm deep.

In late winter and early spring (to end of March):

- Gradual lowering of mid winter levels with some splashy conditions and shallow pools remaining through late February and into March in the lowest fields.

**For breeding waders in spring (ideally blocks 50ha or more in size):**

In early spring (1 March to 30 April):

- Extensive pools providing surface water covering up to 25% of the majority of fields with the lowest lying fields being close to 25%.
- On higher fields and species-rich fields, limited surface water covering less than 10% of the field.

In mid spring (May):

- Some pools in the lower lying fields covering up to 15% of surface area with soft ground and damp soils elsewhere;
- Low intensity grazing from mid-May in those fields not being laid up for hay.

In late spring (June):
A few surface pools present in the lowest lying fields towards the end of this period and into July.

The coastal grazing marshes found within the Othery, Middlezoy, Westonzoyland and Chedzoy area, with its associated network of ditches and ponds, is considered to be a habitat of primary importance in the UK Biodiversity Action Plan (1996).

In addition, the 27 km of watercourses in the Plan area are a rich source of biodiversity interest, supporting good populations of Water Vole and are regularly used by Otters.

An effective water management system which is beneficial to the maintenance and possible enhancement of the conservation and biodiversity interests of the area is a key objective of the WLMP.

## 5.2. Biodiversity Action Plans

The Parrett IDB and the Environment Agency acknowledge that they have a duty to further the conservation and enhancement of biodiversity, as public bodies under the Land Drainage Act 1991 and the Natural Environment and Rural Communities Act 2006. The Implementation Plan of the DEFRA Internal Drainage Board Review commits every IDB to producing its own Biodiversity Action Plan (BAP) by April 2010. Guidance has been produced by the Association of Drainage Authorities, DEFRA and Natural England to assist the Parrett IDB meet this commitment.

Through their water level management activities, the Parrett IDB and the Environment Agency already achieve much for conservation and biodiversity. By introducing Biodiversity Action Plans for all IDBs, it is hoped that the conservation and enhancement of biodiversity, particularly outside the boundaries of Sites of Special Scientific Interest (SSSI), can be better integrated into IDB planning and work programmes. In addition, Biodiversity Action Plans will provide IDBs with a formal mechanism to better demonstrate and record the contribution to biodiversity that they already make.

By setting objectives and targets to conserve and enhance wetland species and habitats, IDB Biodiversity Action Plans will help to link the ongoing conservation work of IDBs to the national and local BAP targets and actions. It will also facilitate the recording of BAP habitat gain to be set against the DEFRA flood risk management Outcome Measures target for UK Biodiversity Action Plan habitat creation. The Parrett IDB proposes to complete the BAP for its area by April 2010.

## 5.3. Conservation management

The current practices adopted by the Parrett IDB and the Environment Agency for the maintenance of watercourses help to maintain the conservation and biodiversity interest of these wetland habitats in balance with the need for effective drainage and irrigation throughout the Plan area.

The Environment Agency follows strict local guidelines for weed cutting and general vegetation management that have been developed through best practice and with the expertise of specialist teams. The Environment Agency is currently developing national guidelines regarding the maintenance of watercourses.

Financial support for the conservation management of land is available from Natural England who administers the Environmental Stewardship scheme on behalf of DEFRA.

## 5.4. Archaeology

The wetlands of the Somerset Levels and Moors contain a wealth of archaeological information often hidden under layers of peat and clay that have built up over many millennia. This has had three significant effects:

a) Organic remains such as wood and leather are preserved because the waterlogging excluded oxygen and prevented the normal types of decay which destroy these materials on normal archaeological sites;

b) The waterlogged conditions also preserve pollen grains, plant material, insects, snails and even macroscopic plant and animal remains. These constitute a unique record of the past natural and man-made environment stretching back over the last 6,000 years. They can also provide information concerning human activity on the neighbouring dry land, and past changes in climate and sea levels;

c) The normal methods of archaeological detection do not work well in wetland areas where sites can be deeply buried. The number of known archaeological sites is therefore only a small fraction of the existing total. It is extremely likely that all the river valley wetlands in Somerset contain a wealth of important archaeological sites. In addition there are several types of sites such as fisheries, medieval flood defences and small river ports of which we know very little, but may exist in considerable numbers.

The organic archaeological remains from the Somerset Levels and Moors depend for their continued survival on an anaerobic waterlogged burial environment. If the surrounding peat or clay dries out the organic material will shrink considerably and crack apart. The presence of oxygen will also allow bacterial and fungal decay to resume and eventually completely destroy the artifacts.

The peat itself, and the precious information contained within it, are also adversely affected by desiccation. Where field water tables are below ground level for long periods of time, the shrinkage and chemical breakdown of peat soils can be significant, and can gradually destroy all the archaeological information contained within them. In this regard the summer is the crucial period, as that is when in field water tables are generally at their lowest and therefore peat wastage highest.

A prehistoric trackway has been recorded on the banks of the King's Sedgemoor Drain near Sutton Mallet (ST 355 372) and English Heritage has advised the Environment Agency that this site is at risk from drying out.

A water management system beneficial to the continued preservation of wetland archaeological is a key objective of the WLMP. The locations of the archaeological sites in the Plan area are shown on Map 6.

# 6. Constraints and impacts on adjacent ground

## 6.1. Works adjacent to Main River

Any work proposed in, over, under or adjacent to Main River requires Flood Defence Consent (FDC) from the Environment Agency. Land Drainage Byelaws require third parties to apply for consent for any alterations or new works within an eight metre strip on either side of the Main Rivers. Where consent is applied for on land which forms part of an SSSI or other designated sites, the applicant is obliged to consult Natural England and the Environment Agency will only consider giving consent on the basis that there is no objection to the proposal from Natural England.

This condition will also apply to proposals that lie outside the boundary of an SSSI or designated site but which may impact on them.

The Environment Agency's Panel Engineer under the Reservoirs Act 1975 will be consulted, in advance if any maintenance or repair works are required, which may impact on the operation of Southlake Reservoir. These works will require advance consent.

## 6.2. Works adjacent to IDB rhynes

Under the Land Drainage Act 1991, the Drainage Board has administrative responsibility for all the Viewed Rhynes and ordinary watercourses within the Plan area for the purposes of consenting activities as set out in the Board's Byelaws. The Board exercises this administrative control using a series of policy documents adopted by the Board for this purpose.

The Parrett IDB Byelaws require third parties to apply for consent for any alterations or new works within a nine metre strip on either side of a Viewed Rhyne. Where consent is applied for on land within an SSSI, the Parrett IDB consults Natural England before arriving at its decision. The form of consent given by the Parrett IDB states that such consent does not override the necessity of obtaining other statutory consents (including that of Natural England).

# 7. Current water management practices

## 7.1. Current water level management regime

In general, water levels are maintained at a relatively high level during the summer months to provide wet fences and, to a certain extent, to keep water tables high to promote the growth of grass and other crops. During the winter periods, water levels are lower in order to accommodate increased rainfall and runoff, and to reduce the risk or severity of flooding.

The dates upon which these changes in water level are implemented each year are normally 1 April for summer levels and 1 December for winter levels. In practice, however, the seasonal water levels are usually phased in two weeks either side of these 'normal operating dates', depending on the prevailing weather conditions at the time. This system has come about through custom and practice and generally works well.

From time to time, depending on the prevailing weather conditions, requests may be received by the Parrett IDB to advance or delay these seasonal operations. Should these requests require operations to be advanced or delayed by more than the two weeks either side of the 'normal operating dates', then the Parrett IDB will seek the views of Natural England on this proposal.

The current water management at key control structures is shown in Tables 2-5. The Parrett IDB will consult Natural England if they are considering changing the water levels at a structure so that it falls outside the range given in the Plan.

There are currently three Raised Water Level Areas (RWLAs), in seven ownerships, in which the ditch water levels are kept seasonally higher than the general level in the moor by isolating the watercourses from the Drainage Board system. In these RWLAs, the winter levels are currently raised from 1 December through to 1 May. This practice in Southlake will change when the RWLA is decommissioned and the arrangements to establish a winter roost on Southlake are introduced. The operating procedures for the proposed winter roost on Southlake are described in Section 9.

Details of the current areas with seasonally higher water levels are given in Table 8 and are shown on Map 4.

**Table 8: Current areas with seasonally higher water levels in in Othery, Middlezoy, Westonzoyland and Chedzoy**

| Raised Water Area Number | Name of Owner/ Occupier | Area in hectares | Area in acres |
|---|---|---|---|
| 1 | Southlake Moor RWLA | 43.1 | 106.5 |
| 2 | Mr D. Gillard (Langmead and Weston Level) | 9.6 | 23.7 |
| 3 | Mr D. Gillard (Earlake) | 34.2 | 84.5 |

The Drainage Board is unaware of any significant private pump drainage schemes in the Plan area that are operated by landowners to lower water levels in the ditches around their fields.

**Table 9: Areas with seasonally lower water levels in Othery, Middlezoy, Westonzoyland and Chedzoy**

| Lower Water Area | Name of Owner/Occupier | Area in hectares | Area in acres |
|---|---|---|---|
| | | | |

## 7.2. Current flood management regime

The Environment Agency has permissive powers to carry out works to reduce flood risk on Main Rivers. Within this Plan area the primary flood defences are raised earth embankments located on the right bank of the River Parrett, ranging in height from 8.4 about 9.0 m AOD. There are sections of "harder" engineered embankments, which take the form of steel piles or masonry walls where space is at a premium. These defences are inspected regularly to ensure they provide the flood risk management benefit that they were designed for. The Environment Agency also undertakes routine maintenance i.e. weed cutting, tree pruning and removal. Emergency repair/maintenance works are also carried out when necessary. Environment Agency staff are deployed to actively monitor high tides on the tidal section of the Parrett.

As shown in Tables 4 and 5, there are a number of small sluices or penstocks which provide a water level control function for wet fencing, stock and biodiversity and a gravitational discharge

during flood events. Larger structures include Westonzoyland Pumping Station, Chedzoy Sluice and Lake Wall Flap. Southlake Moor is a reservoir with Burrow Wall embankment being the retaining structure classified under the Reservoirs Act 1975. In accordance with the Reservoirs Act, Burrow Wall is inspected by an engineer annually.

### Box 3: Southlake Moor and the Reservoirs Act 1975

Southlake Moor Reservoir is situated approximately 7km north east of Langport, adjacent to the A361. The 'dam' is formed by an earth-fill embankment which carries a masonry wall with a height of 1.5m, this is mostly covered by grass and has often been repaired in the past. There are a number of properties built along the crest of the dam which have breached the masonry wall in places. This embankment dam has been classified as Category D under the Reservoirs Act 1975, meaning that no loss of life can be foreseen as a result of breach and limited flood damage would be caused.

The reservoir has an approximate capacity of 785,000 cubic metres, (assuming a 1m depth of retained water) and a surface area of 1,630,000 square metres when full to its top water level. The reservoir can accept water via two mechanisms. The first being controlled flooding of the moor via penstocks and control gates located along both the River Parrett and along Challis Wall Rhyne. The second method of water inundation would occur if either the River Parrett or the River Sowy overtopped their embankments.

The Environment Agency is, and will remain, the Undertaker for the dam structure under the Reservoirs Act 1975, and it will also manage the outlet flows via the A361 Sluice. The panel engineer has confirmed that the new IDB inlet structure will not be classified under the Act.

The King's Sedgemoor Drain plays a vital part in discharging large volumes of floodwater from the Sowy and Langacre Rhyne into the River Parrett via Dunball Sluice. The King's Sedgemoor Drain also receives water from the Plan area via Chedzoy Clyce. In times of high river flow the gates in Dunball Sluice are opened during low tide, to release water from the King's Sedgemoor Drain into the River Parrett. However, high levels and high flows in the King's Sedgemoor Drain can result in Chedzoy Clyce remaining closed, causing flooding in adjacent areas and so the operation of Dunball Sluice is critical at these times. The Drainage Board and the Environment Agency will review the operation of Dunball Sluice and consider opportunities to lower water levels in the King's Sedgemoor Drain in advance of floodwater arriving at the Sluice.

The Environment Agency also commissions studies regarding flood risk management within the Plan area and is currently developing the Parrett Catchment Flood Management Plan, and associated Flood Management Strategies, which will look at flood defence, land management and climate change impacts on the catchment over the next 100 years.

**Box 4: Flood Zones**

The Flood Map shows areas across England and Wales that could be affected by flooding from rivers and/or the sea. It has been produced by the Environment Agency to raise awareness among the public, local authorities and other organisations of the likelihood of flooding and to encourage people living and working in areas prone to flooding to find out more and take appropriate action. The Flood Zones in the Plan area are shown in Map 8.

Flood Zones are also known as floodplains which could be affected by flooding from rivers and the sea. There are three zones which are defined in the Government's planning policy for England. They ignore the presence of existing flood defences as these can be overtopped and even fail in an extreme event.

Zone 1 - is shaded white and shows areas with the lowest probability of flooding from rivers or the sea and where the chance of flooding in any one year is less than 0.1% (i.e. less than a 1 in 1000 chance).

Zone 2 - is shaded turquoise and shows areas where the chance of flooding in any one year is between 0.1% and 1% for flooding from rivers (i.e. a 1 in 1000 to a 1 in 100 chance), or 0.5% for flooding from the sea (i.e. 1 in 200 chance). The outer edge of this zone is referred to as the 'Extreme Flood Outline' (EFO).

Zone 3 - is shaded blue and shows areas with the highest probability of flooding where the chance of flooding in any one year is greater than 1% for flooding from rivers (i.e. a 1 in 100 chance), or 0.5% flooding from the sea (i.e. a 1 in 200 chance).

It is important to understand that a 1 in 100 chance of flooding in any one year does not mean that level of flood will happen once every 100 years, nor does it mean that if the flood hasn't happened for the last 99 years, it will happen this year. In fact, a flood of this magnitude may occur more than once in a year.

## 7.3. Current watercourse maintenance regimes

### 7.3.1. Environment Agency maintenance practices

The Environment Agency assesses all maintenance works on the basis of flood risk to people and property, and whether the management system is high, medium or low risk. As a result, annual maintenance is targeted towards high risk systems.

The Environment Agency operates a flexible, annual weed cutting programme during the summer months. The Main Rivers are inspected prior to starting, and the programme can be changed to accommodate urgent cuts or abnormal weather and vegetation conditions. It is normal practice to provide good access for weed-cutting machinery, which consists of culverting side ditches and providing gates and side fencing so that travel across field boundaries is unrestricted.

The tidal River Parrett lies adjacent to the western boundary of the Plan area and receives water from the West Sedgemoor Pumping Station. The Parrett carries a heavy load of estuarine silt on each tide and the merits and cost effectiveness of dredging the tidal Parrett has been debated by drainage engineers for many years. Various studies and investigations are being carried out by the Environment Agency on Main Rivers at present to look in to siltation and channel conveyance. When these studies are complete, and monitoring has been carried out, the current approach to non-routine maintenance will be reviewed by the Environment Agency and the Drainage Board.

The left and right banks of the Parrett Estuary are flailed annually where no regular grazing takes place. This is done to control weed growth and reduce the risk of animal infestation which could destabilise the banks. The Environment Agency does not typically use herbicides in this area.

Tide flaps and outfalls are checked regularly throughout the year and prior to high tides, for damage and blockages. Blockage removal is rarely required in the River Parrett as the channel is large enough to flush through most obstructions. Blockages in the King's Sedgemoor Drain are only removed if they pose a flood risk or if they might adversely affect the operation of Dunball Sluice.

Trees, branches and bushes within the channel area are trimmed, coppiced or pollarded to allow maximum flow whilst retaining as much shade as possible to reduce weed growth. Tree removal will take place in exceptional circumstances where blockage of the channel has occurred or is likely to occur. The Environment Agency expects riparian landowners to maintain trees and vegetation that could cause flood risk. Where necessary, the Environment Agency will serve notice on landowners to ensure works are completed as requested. Where the Environment Agency owns land, it will carry out any required tree maintenance.

Non-routine maintenance is not normally carried out by the Environment Agency without prior consultation with the Parrett IDB and with Natural England. The Environment Agency will inform Natural England of any repairs or maintenance required during emergency situations as soon as is practically possible.

### 7.3.2. Parrett IDB maintenance practices

The Parrett IDB maintains all Viewed Rhynes in the Plan area in late summer or during the winter. A few minor rhynes are weedcut on an 'as necessary' basis, the situation being re-assessed each year. Viewed Rhynes are occasionally de-silted to prevent their condition from deteriorating and to sustain the required water depth and flow. Aquatic herbicides are not routinely used by the IDB, but may be used to control invasive plants. The use of aquatic herbicide in any watercourse requires consent from the Environment Agency and from Natural England when used within the SSSI.

The maintenance of watercourses adjoining Viewed Rhynes is the responsibility of the riparian occupiers. The Board has powers under its Byelaws to require occupiers to fulfil their obligations in this respect where they fail to do so.

Water control structures are inspected by the Parrett IDB on a regular basis and repaired as necessary. The Board does not accept any liability for the maintenance of bridges and culverts over Viewed Rhynes, however it is prepared to consider making an *ex gratia* contribution of a share of the cost of such maintenance, approximately in proportion to its usage by the IDB. The Parrett IDB does not accept any liability for the maintenance of droves, and only carries out such maintenance, or contributes to the cost of maintenance, where droves are essential to the Board for gaining access to a channel, or where damage has been caused by works carried out on behalf of the IDB.

# 8. Objectives for water level management in the future

The Water Level Management Plan is based on the following objectives which have been adopted by the signatories to the Plan. The signatories acknowledge that not all the objectives can be achieved on each and every occasion or location.

***Objective 1 - Balance of interests***
Firstly, ensure that all legal obligations and responsibilities are met, and secondly to balance different interests by managing water in a way that reflects the local hydrology and topography of the area and which best serves the owners and farmers of the majority of the land within each sub-catchment.

***Objective 2 – Agriculture***
Maintain seasonal water levels that provide wet fences, stock watering and drainage appropriate for the principal land management and farming practices in each sub-catchment.

***Objective 3 – Biodiversity***
Maintain and enhance, when suitable opportunities arise, wet grassland, wetland and freshwater aquatic habitats and species throughout the Plan area, with particular attention being given to those protected by law or designated in some way.

***Objective 4 - Favourable condition of SSSIs***
Implement a programme of improvement works to ensure that the management of water that affects the SSSI(s) in the Plan area helps to secure, or makes significant progress towards achieving, these SSSIs being in favourable condition by December 2010.

***Objective 5 - Organic soils and archaeology***
Maintain a stable, year round water table that avoids desiccation and oxidation of the organic soils.

***Objective 6 - Settlements and highways***
Ensure the proposed changes in water management do not increase the flood risk to settlements, property, highways or rights of way.

***Objective 8 - Watercourse maintenance operations***
Maintain the watercourses in the Plan area on rotation and in a sympathetic manner, so as to maintain an adequate flow of water around the sub-catchments, and to enhance the diversity of ditch habitats and their associated flora and fauna.

***Objective 9 - Water quality***
Sustain the ditch flora and fauna in the Plan area through the provision of an adequate supply of water of high quality (defined as having water in a ditch at a given season of sufficient chemical quality and volume to sustain the full diversity, abundance and distribution of all aquatic plants and animals recorded in the area).

***Objective 10 - Flood management***
Avoid prolonged and deep flooding where this is damaging to the biodiversity and agricultural interests of the Plan area.

***Objective 11 - Drought management***
Avoid prolonged drought where this is damaging to the soils, biodiversity, archaeology and agricultural interests of the Plan area.

# 9. Proposed water management practices

## 9.1. Proposed continuation of current good practice

Many of the current management practices carried out by the Parrett Drainage Board are meeting the needs of both farming and conservation. These good practices will continue, as set out below.

### Proposal 1: The current summer and winter penning levels in the watercourses of Langmead and Weston Level SSSI will continue to be maintained by the Drainage Board.

Reason: The current target water levels for Langmead and Weston Level SSSI are known to be achieving favourable condition and are compatible with the farming practices which are suitable for this area. These target water levels for this SSSI are set out in Table 10.

**Summer season:** Aim to achieve summer pen levels from 1 April. In a dry season or year this might be brought forward by two weeks, in a wet season or year this may be delayed by a week.

**Winter season:** Aim to achieve winter pen levels by 30 November. In a dry season or year this might be delayed by two weeks, in a wet season or year this may be brought forward by a week.

**Table 10: Current target water levels in summer and in winter for Langmead and Weston Level SSSI**

| Control Structures: | Summer level (m AOD) | Winter level (m AOD) |
|---|---|---|
| Westonzoyland Pumping Station | 2.75m | 2.50m |
| Chedzoy Clyce Tilting Weir | 2.64m | Right down so that it effectively operates at the King's Sedgemoor Drain level via Dunball Sluice (~ 2.13m) |

Notes:

1. The water level range follows the principle established in Proposal 9 that a 'normal water level' lies within 50mm of the level specified within the Plan.
2. The two control structures influencing water levels are some distance from the SSSI
3. The Environment Agency and the IDB have agreed to meet three weeks before the normal operating date to confirm summer/ winter penning dates based on catchment conditions.

### Proposal 2: The current spring, summer and autumn penning levels in the watercourses of Southlake Moor SSSI will continue to be maintained by the Drainage Board.

Reason: The current target water levels in spring, summer and autumn are known to be achieving favourable condition on Southlake Moor SSSI. These target water levels in spring, summer and autumn for Southlake Moor SSSI are set out in Table 11. The Parrett IDB proposes to change the winter water management of the SSSI as set out in Proposals 9 and 10.

**Summer season:** Aim to achieve summer pen levels from 1 April. In a dry season or year this might be brought forward by two weeks, in a wet season or year this may be delayed by a week.

**Table 11: Current target water levels in summer for Southlake Moor SSSI**

| Control Structures | Summer level (m AOD) | Range |
|---|---|---|
| A361 Sluice | 3.60m<br>(no change) | 3.55 – 3.65m |
| Southlake Sluice | 3.65m<br>(no change) | 3.60 – 3.70m |

Notes:

1. The water level range follows the principle established in Proposal 9 that a 'normal water level' lies within 50mm of the level specified within the Plan.
2. The Environment Agency and the IDB have agreed to meet three weeks before the normal operating date to confirm summer/ winter penning dates based on catchment conditions.

### Proposal 3: The current summer and winter penning levels in the other watercourses of the Plan area outside the designated sites will continue to be maintained by the Drainage Board.

Reason: The current target water levels in watercourses outside the designated wildlife sites appear to be favourable to the farming and wider biodiversity interests of the area.

### Proposal 4: The current maintenance of the Viewed Rhynes will continue to be undertaken by the Drainage Board.

Reason: The Parrett IDB has reviewed its procedures for maintaining the Viewed Rhynes within Southlake Moor SSSI, Langmead and Weston Level SSSI, and the rest of the Plan area it is responsible for. The Parrett IDB is of the opinion that its current maintenance procedures help to achieve favourable condition in the SSSI, and further conservation and biodiversity in the watercourses throughout the area. The IDB will keep these maintenance procedures under review but does not currently propose to change any of these procedures.

## 9.2. Proposed changes to water control infrastructure

Natural England has advised the Parrett IDB that the management of water in the winter months on Southlake Moor SSSI has been, and currently remains, one of the principal reasons why the SSSI is not achieving favourable condition. The restoration of winter flooding on Southlake Moor is, therefore, a key objective of the new WLMP.

Southlake Moor SSSI was included in the Special Protection Area because, when flooded in winter, the site provides extensive roosting and feeding habitat for large numbers of wintering ducks, waders and Bewick's swan. Winter flooding remained a regular management feature on Southlake until the mid-1990s, when it was discontinued due to the poor condition of control structures and safety concerns over their operation.

The Environment Agency completed its capital works for favourable condition on Southlake Moor in 2005. This consisted of upgrading the A361 Sluice structure and replacing the old structure at Southlake Sluice with a new tilting weir.

Phase 1 of the capital improvement works has recently been carried out at Southlake Moor SSSI by the Parrett IDB (in winter 2008 – 2009) in order to help achieve the objective of favourable condition. These Phase 1 works are listed in Table 12.

**Table 12: Recently completed capital improvement works (Phase 1) by the Parrett IDB to help achieve favourable condition on Southlake Moor SSSI**

| Action Ref. | Description of the actions completed in Phase 1 to help achieve favourable condition on Southlake Moor SSSI (location of structures are shown on Map 7) |
|---|---|
| **1** (IDB action & operation) | **Install new penstock structure on Challis Wall Rhyne to isolate Southlake from Burrow Wall Rhyne, ST 3786 3033** Isolate Burrow Wall Rhyne from the Southlake system by constructing a sheet pile structure on Challis Wall Rhyne, at the end of the northern isolation bank between Challis Wall and the River Sowy. Install 600mm non-rising spindle penstock within the structure. |
| **2** (IDB action & operation) | **Construct new inlet structure to Southlake from the River Sowy to Challis Wall, ST 3792 3015** Construct new inlet structure to improve control of the summer feed to Southlake and allow winter flooding from the Sowy. Excavate and re-profile the existing watercourse to provide a channel to convey water to Challis Wall Sluice from the Sowy River. |
| **3** (IDB action & operation) | **Construct a short length of flood bank, between the left bank of the Sowy and Challis Wall, ST 3790 3024** Construct a short length of flood bank between the Sowy River Bank and Challis Wall Bank, to the north of the inlet channel. |
| **4** (IDB action & operation) | **Construct new access crossing on the new inlet channel** Excavate and remove existing culvert in 'inlet channel' adjacent to Challis Wall Sluice and replace with new twin culverts to provide the crossing. |
| **5** (IDB action & operation) | **Improve access for maintenance along Burrow Wall Rhyne** As part of the work to re-instate low spots on Burrow Wall isolation bank, install a small number of gated crossings along the southern bank of the rhyne. These will improve access for maintenance of Burrow Wall Rhyne and minimise damage to the SSSI. |

## Proposal 5: Further capital improvement works (Phase 2) will be carried out by the Parrett IDB to help achieve favourable condition on Southlake Moor SSSI.

Reason: A number of other capital improvement works (Phase 2) are proposed by the Parrett IDB in order to help achieve the objective of favourable condition on Southlake Moor SSSI. These are listed in Table 13.

**Table 13: Proposed capital improvement works (Phase 2) by the Parrett IDB to help achieve favourable condition on Southlake Moor SSSI**

| Action Ref. | Description of the proposed actions in Phase 2 to help achieve favourable condition on Southlake Moor SSSI (location of structures are shown on Map 7) |
|---|---|
| **1.** (IDB action & operation) | **Raise level of low spots on Challis Wall and Burrow Wall isolation banks, between Challis Wall Sluices and the A361 structure** Raise low spots on isolation banks, to form a minimum common level of 5.30 AOD. Lengths extend from Challis Wall (isolation bank) to Pathe Bridge and from Pathe Bridge to Burrow Mump (Burrow Wall isolation Bank). |
| **2.** (IDB action & operation) | **Review Challis Wall Sluice, ST 3773 3021 (EA structure)** The current function of this sluice will be performed by the new Southlake Inlet structure in the left bank of the Sowy. The Parrett IDB will review the need to remove, retain or replace the existing control mechanisms on this sluice in Phase 2. If the structure is to be retained, the Parrett IDB will negotiate handover of operation from Environment Agency.<br>• Proposed works to be completed by: March 2010 |

**Table 13 (continued): Proposed capital improvement works (Phase 2) by the Parrett IDB to help achieve favourable condition on Southlake Moor SSSI**

| | |
|---|---|
| **3.** (IDB action & operation) | **Review need for Pathe Sluice on Burrow Wall Rhyne (EA structure)**<br>Following the operation of Phase 1, review the need for the small penstock (and winter penning boards) at Pathe Bridge in order to improve water flows in Burrow Wall Rhyne.<br>• Proposed works to be completed by: March 2010 |
| **4.** (IDB action & operation) | **RWLA structures (EA structures)**<br>In Phase 2, remove blockages and reconnect isolated ditches (e.g. remove structures and bunds, and open blocked culverts).<br>• Proposed works to be completed by: March 2010 |
| **5.** (IDB action & operation) | **Hembrow's Bay (EA structure)**<br>• Proposed works to be completed by: March 2010 |
| **6.** (IDB action & operation) | **Old Southlake Inlet (EA structure)**<br>Review condition of existing structure in Phase 2, make safe and secure the existing Southlake Inlet from the Parrett.<br>• Proposed works to be completed by: March 2010 |

On completion of these capital improvements for favourable condition, and successful trials, the Drainage Board proposes to decommission the existing Raised Water Level Area scheme currently operating on Southlake Moor with the agreement of Natural England, the Environment Agency and the landowners whose land would be affected.

## Proposal 6: Capital improvement works will be carried out by the Parrett IDB in the Plan area for Health and Safety reasons.

Reason: The Parrett IDB need to undertake some capital improvement work on other water control structures so that they may be operated safely by IDB staff, and to ensure that these structures do not provide an unacceptable risk to the general public. These proposed capital improvements are set out in Table 14.

The Environment Agency has carried out site assessments using a national Public Safety Risk Assessment system. Substantial upgrades for improved public safety and operator safety have been undertaken since 2002. The majority of sites within the Plan area have been completed, with the remainder of identified sites to be finished by mid 2009.

**Table 14: Proposed capital improvement works to Parrett IDB structures for health and safety reasons**

| Action Ref. | Description of the proposed actions required for health and safety reasons (location of structure shown on Map 7) |
|---|---|
| 1. (IDB action & operation) | **Location: Inlet Rhyne Weir**<br>Erect fencing |
| 2. (IDB action & operation) | **Location: Palmers Hern Penning Boards**<br>Provide access bridge and safety handrails |
| 3. (IDB action & operation) | **Location: Chedzoy Tilting Weir**<br>Provide safety handrails and fencing |

### Proposal 7: The Drainage Board and the Environment Agency will review the operation of Chedzoy Clyce and Lake Wall Flap Valve.

Reason: The flap at Chedzoy Clyce does not always close effectively during high levels in the King's Sedgemoor Drain leading to an increased risk of flooding in the Chedzoy area. Debris can also prevent the flap from closing during high levels in the Drain with the same consequences.

The flap at Lake Wall no longer serves an effective purpose and there may be some merit in removing it altogether.

### Proposal 8: Additional gauge boards and telemetry stations will be installed by the Parrett IDB in the Plan area.

Reason: To improve its capabilities regarding the management of water levels in the Southlake area, the Parrett IDB proposes to install additional gauge boards in the locations set out in Table 15. In addition, the Parrett IDB proposes to install water level sensors upstream and downstream of the Southlake Inlet in order to inform and aid the management of water levels, and the operation of the Inlet. These telemetry units will record water levels, and alarms settings will be set up to report status directly to the Drainage Board Office.

The Environment Agency has replaced many gauge boards within the Plan area over the last 12 months, and has installed a new board at Challis Wall Sluice. There are no plans to install any new telemetry sites within the Plan area, though existing telemetry is regularly assessed and upgraded as deemed necessary for optimum management capability.

**Table 15: Proposed additional gauge boards or telemetry stations in the Othery, Middlezoy, Westonzoyland and Chedzoy area**

| Location | Grid Reference | Notes | Operator |
|---|---|---|---|
| Southlake Inlet | ST 3792 3015 | Telemetry & gauge board (upstream & downstream) | Parrett IDB |
| Southlake Sluice | ST 3642 3064 | Telemetry & gauge board (upstream only) | Parrett IDB |
| Straight Drove | ST 3750 3030 | Telemetry to supplement existing gauge board | Parrett IDB |

## 9.3. Proposed changes to target water levels

### Proposal 9: In Southlake Moor SSSI, the Parrett Drainage Board will trial the target winter water levels set out in Table 16 during winter 2009-10 providing (a) these levels are agreed by the owners and occupiers of the significant majority of the land affected, and (b) these levels are compatible with any agri-environment scheme agreements that exist on the significant majority of the land affected.

Reason: The current winter water levels at the key control structures are not achieving water management for favourable condition in Southlake Moor SSSI. The recently completed and the proposed improvements to the water control infrastructure outlined above will be tested during the winter of 2009-10 to demonstrate how the Parrett IDB and others intend to achieve water management for favourable condition in the SSSI in the following years.

The proposed target winter water levels to be tested at the key control structures in the winter 2009-10 are shown in Table 16.

**Winter season:** Aim to achieve winter pen levels by 30 November. In a dry season or year this might be delayed by two weeks, in a wet season or year this may be brought forward by a week.

**Table 16: Proposed target winter water levels at key control structures in Southlake Moor during winter 2009-10**

| Structure | Current winter water levels (m AOD) | Proposed target winter water levels in the future (m AOD) |
|---|---|---|
| Southlake Inlet and Southlake Sluice | Southlake Inlet – new structure, no previous levels operated.<br>Southlake Sluice – 3.40m approx.<br>(Within the existing RWLA winter water levels are currently held at 3.85 or 4.00m depending on the structure and location) | Rising from 3.60 to 4.20m from 1 – 15 December, as the Moor fills with water from the Sowy<br>4.20m from 15 December to 31 January (usual range 4.10 – 4.20m)<br>Falling from 4.20 to 3.80m during early February (so that water levels are back in ditch)<br>3.55 – 3.65m in March (usual range 3.50 – 3.70m) |
| Challis Wall Sluice | 3.60m upstream<br>3.40m downstream | ~ 3.60m<br>(usual range 3.50 – 3.70m) |
| Aller Drove Inlet | Closed | Closed |

Notes:
1. The water level range follows the principle established in Proposal 9 that a 'normal water level' lies within 50mm of the level specified within the Plan.
2. The Environment Agency and the IDB have agreed to meet three weeks before the normal operating date to confirm summer/ winter penning dates based on catchment conditions.

**Proposal 10: In Southlake Moor SSSI, the Parrett IDB will trial the target winter water levels set out in Table 17 for a period of 2 – 5 years starting in winter 2010-11 providing (a) these levels are agreed by the owners and occupiers of the significant majority of the land affected, and (b) these levels are compatible with any agri-environment scheme agreements that exist on the significant majority of the land affected.**

Reason: The current winter water levels at the key control structures are not achieving water management for favourable condition in Southlake Moor SSSI. The recently completed and the proposed improvements to the water control infrastructure outlined above will operated in winter 2010-11 and in the following winters to ensure the Parrett IDB provides the water management for favourable condition in the SSSI.

The optimum winter water levels for favourable condition at the key control structures in or affecting Southlake Moor SSSI should be arrived at by a series of trials conducted over a number of years during this WLMP. The proposed target winter water levels to be tested at the key control structures are shown in Table 17.

**Winter season:** Aim to achieve winter pen levels by 30 November. In a dry season or year this might be delayed by two weeks, in a wet season or year this may be brought forward by a week.

**Table 17: Proposed target winter water levels at key control structures in Southlake Moor during winter 2010-11 and in the following winters**

| Structure | Current winter water levels (m AOD) | Proposed target winter water levels in the future (m AOD) |
|---|---|---|
| Aller Drove Inlet | Closed | Closed |
| Southlake Inlet and Southlake Sluice | Southlake Inlet – new structure, no previous levels operated.<br><br>Southlake Sluice – 3.40m approx.<br><br>(Within the existing RWLA winter water levels are currently held at 3.85 or 4.00m depending on the structure and location) | 3.60 – 4.20m from 1 – 15 December, as the Moor fills with water from the Sowy<br><br>4.20 – 4.30m from 15 December to 31 January (usual range 4.00 – 4.40m)<br><br>3.90 - 4.10m in February (usual range 3.80 – 4.20m)<br><br>3.55 – 3.65m in March (usual range 3.50 – 3.70m) |
| Challis Wall Sluice | 3.60m upstream<br>3.40m downstream | ~ 3.60m<br>(usual range 3.50 – 3.70m) |

Notes:
1. The water level range follows the principle established in Proposal 9 that a 'normal water level' lies within 50mm of the level specified within the Plan.
2. The Environment Agency and the IDB have agreed to meet three weeks before the normal operating date to confirm summer/ winter penning dates based on catchment conditions.

## 9.4. Proposed changes to operational procedures

### Proposal 11: The Parrett IDB will change the winter operation of key control structures as described below to implement Proposal 9 and 10.

Reason: The current operation of key control structures in winter is not achieving water management for favourable condition in Southlake Moor SSSI. The recently completed and the proposed improvements to the water control infrastructure outlined above should help the Parrett IDB to achieve water management for favourable condition in the SSSI during the winter months by adopting the operational procedures described below.

a) The tilting weir at Southlake Sluice will be raised at the end of the summer penning season and, from the 15 December to the 1 February, winter levels on Southlake Moor will usually be controlled by the new Southlake Inlet;

b) Following (a) above and before winter levels are established in the Sowy, both penstock doors of the Southlake Inlet will be lowered (i.e. opened) to allow water levels in Southlake to increase to summer levels in the Sowy (approximately 4.00m). If necessary, water levels in Southlake can then be raised further by increasing water levels in the Sowy to 4.20m, for approximately 48 hours. This mechanism for increasing levels on Southlake should only be used at the end of the summer penning season when the other inlets from the Sowy (upstream of Beer Wall) are closed. Once the target level of 4.20m has been achieved in Southlake the large penstock at the Southlake Inlet will be raised to maintain a pen level of 4.20m and the Sowy can then operate at a lower level for the rest of the winter;

c) When the water level in the River Sowy exceeds this level (4.20m), water will be able to flow through the inlet and into Southlake Moor and top up the Moor as required;

d) The small penstock should usually remain closed throughout the rest of the winter;

e) During prolonged periods of high water levels in the Sowy River, when the required water levels in Southlake have been achieved, the operating mechanisms on the Southlake Inlet can be closed to enable the Sowy Bank to operate as a flood bank;

f) By the beginning of February, after a four to six week period of maintaining levels at 4.20m or above, water will be evacuated to the Sowy, through Challis Wall and the Southlake Inlet, or to the Penzoy system, through the Southlake Sluice;

g) Levels on Southlake will be reduced gradually by lowering (i.e. opening) the large penstock door at the Southlake Inlet and discharging water to the Sowy. If necessary, the smaller penstock can also be opened to enhance the evacuation of water to the Sowy. The variable crests of these structures will allow a gradual draw down over time should this be required;

h) Once a winter level of 3.60m has been achieved on Southlake, both penstocks of the Southlake Inlet will be closed and the tilting weir at Southlake Sluice will be used to maintain a winter pen level through February and March, until the introduction of the summer pen in April;

i) The Southlake Inlet replaces the previous arrangement for floodwater evacuation to the Sowy through Aller Drove Inlet. Whilst this option is still available, by opening the Isolation structure and Aller Drove Inlet, care must be taken to ensure high water levels do not flood Aller Drove. As the capacity of the new connection with the Sowy greatly exceeds that of the old arrangement, it is unlikely that the floodwater evacuation from Southlake via the Aller Drove Inlet will be required;

j) If sufficient capacity exists in Burrow Wall Rhyne, water may also be evacuated by the lowering of Southlake Sluice and A361 Sluice. However this must be undertaken very cautiously due to flood risk to the A361 and downstream areas. The new Isolation Structure will be closed to retain higher winter water levels on Southlake Moor. This will also allow the Burrow Wall Rhyne to function independently from the scheme area. However, the Isolation Structure incorporates a culvert pipe and penstock which can be operated to allow water to flow in either direction should the need arise;

k) The operation of the A361 sluice on Burrow Wall Rhyne will only control water levels in Burrow Wall Rhyne and will no longer control levels on Southlake, which will be controlled by Southlake Sluice instead;

l) The existing two penstocks on Challis Wall Sluice should usually remain open throughout the winter. However if in future it is desired to operate a different water level regime either side of this structure, then this could be achieved by the operation of the Challis Wall Sluice penstocks. The function and operation of Challis Wall Sluices will be assessed a reviewed in first few years of the WLMP.

### Proposal 12: The Parrett IDB will change the operation of key control structures on Southlake Moor SSSI to achieve the summer pen levels as described in Table 11.

Reason: The current target water levels in spring, summer and autumn are known to be achieving favourable condition for Southlake Moor SSSI. However, the building of new infrastructure to provide winter water levels for favourable condition mean that different operational procedures are required to achieve the current summer water levels, as described below:

a) At the transition from winter to summer conditions, both penstocks at the New Southalke Inlet will normally be closed and the tilting weir at Southlake Sluice will control winter levels on the Moor;

b) Once summer levels have been established in the Sowy, by penning water at Beer Wall, the operation of the new Southlake Inlet will allow water from the River Sowy to pass into Southlake Moor. Flow into the Moor will be regulated by the smaller irrigation

penstock, which can operate as either an over-topping or undershot weir that will offer a fine degree of control. The desired summer level on Southlake Moor will be controlled by operating the tilting weir at Southlake Sluice;

c) The penstock on the Isolation Structure should normally remain closed, allowing independent control of feed to Southlake Moor and to the Burrow Wall Rhyne (supplied from Aller Drove and level controlled at the A361 structure). For feed from Aller Drove to pass along Burrow Wall Rhyne, the sluices at Pathe and Langford's Entrance must be opened;

d) If it is necessary to supplement the summer feed to either Southlake or Burrow Wall Rhyne, then it may be possible to achieve this by the opening of the penstock to the Isolation Structure, although this will depend on the relative water levels at the time;

**Proposal 13: The Environment Agency will complete its review of the operation of Dunball Sluice and in consultation with the IDB will agree the conditions when water levels in the King's Sedgemoor Drain can be lowered in advance of floodwater arriving at the Sluice in order to reduce the risk of damage being caused by the anticipated flood.**

Reason: The Environment Agency and the Parrett IDB are jointly looking at the feasibility of pre-emptive lowering of Main Rivers affecting the Plan area, in advance of extreme summer rainfall events. This work is currently in the early stages of investigation.

The operation of Dunball Sluice is recognised as being critical for flood risk management in the East Bridgwater area where it drains via Chedzoy Clyce. High levels and high flows in the King's Sedgemoor Drain can cause flooding in adjacent areas and so the operation of Dunball Sluice is critical during an extreme event, especially in summer.

**Proposal 14: The Parrett IDB will adopt the principle that (a) a 'normal operating date' lies within two weeks of the date given in the Plan, and (b) a 'normal water level' lies within 50mm of the level specified within the Plan, unless the Plan indicates otherwise.**

Reason: The Parrett IDB considers that flexibility is a critical element in the management of water across the Somerset Levels and Moors. The timing of operations (e.g. setting pen levels, watercourse maintenance) and the water levels held both need to be responsive to the prevailing weather conditions at the time. The dates of operations and the water levels set out in this Plan are the product of many years experience and are most likely to be accurate for a 'normal season'.

In order to allow flexibility in the system so that it can better respond to the season, the Parrett IDB proposes to adopt the principle that a 'normal operating date' lies within two weeks of the date given in the Plan and a 'normal water level' lies with 50mm the level specified within the Plan, unless the Plan indicates otherwise. The Environment Agency and the IDB have agreed to meet three weeks before the 'normal operating date' date to confirm summer/ winter penning dates based on catchment conditions. This will improve communication and flexibility surrounding the normal operating date.

If the season or local conditions require the Parrett IDB or the Environment Agency to operate outside these 'normal' parameters, and those described in Section 12 – Contingencies, then consultation with Natural England will take place.

## 9.5. Proposed changes to operational responsibilities

### Proposal 15: The Parrett IDB and the Environment Agency will resolve the proposed changes in ownership and responsibility of selected water control structures and watercourses in the Plan area.

Reason: There are merits in one Operating Authority managing a greater proportion of the smaller structures that control water levels within a defined system. The Environment Agency and the Parrett IDB are negotiating the handover of ownership and operational responsibility for some of the control structures currently owned and operated by the Environment Agency. The structures involved are listed in Table 18.

DEFRA and Government priorities regarding flood risk management have been evolving over the past few years. This has resulted in the Environment Agency is reviewing its priorities and activities. The Environment Agency currently owns and operates many control structures that provide essential land drainage and nature conservation benefits. It also manages and maintains Main Rivers that serve no critical flood defence benefit, including Southlake Engine Rhyne, the Penzoy in Southlake and Aller Moor Engine Rhyne / Aller Drove Rhyne.

**Table 18: Proposed changes in ownership and responsibility of water control structures**

| Structure | Current owner | Current operator | Proposed owner | Proposed operator |
|---|---|---|---|---|
| Challis Wall Sluice (Penzoy) | EA | EA | Parrett IDB | Parrett IDB |
| Southlake Sluice (Penzoy) | EA | EA | Parrett IDB | Parrett IDB |
| Hembrows Penning Bay (Penzoy) | EA | EA | Parrett IDB | Parrett IDB |
| Shepherds Drove Tilting Weir (Penzoy) | EA | EA | Parrett IDB | Parrett IDB |
| Sedgemoor Drove Rhyne Outfall (Sedgemoor Drove Rhyne) | EA | EA | Parrett IDB | Parrett IDB |
| Chedzoy Inlet (Langacre Rhyne) | EA | Parrett IDB | Parrett IDB | Parrett IDB |
| Chedzoy Clyce (Chedzoy Outlet) (Chedzoy New Cut) | EA | Parrett IDB | Parrett IDB | Parrett IDB |
| Southlake Engine Rhyne | N/A | EA | N/A | Parrett IDB |
| Penzoy in Southlake | N/A | EA | N/A | Parrett IDB |
| Aller Drove Engine Rhyne & Aller Drove Rhyne | N/A | EA | N/A | Parrett IDB |

To support the proposed changes of operational responsibilities suggested in the Plan, the Environment Agency and the Drainage Board will agree some emergency operating procedures. The primarily focus is around the Drainage Board's new Southlake Inlet. The Environment Agency will expect that the Drainage Board to comply with reasonable instructions in relation to the release of water from Southlake Moor and the timing of such. The Drainage Board will comply with requests to stop or moderate flows into the Moor where there is reasonable concern for any part of the registered structures. In flood events, occasions may arise when the

Environment Agency would need to use Southlake Moor for flood water storage, using the Southlake Inlet structure.

The Penzoy is the principal supplier of water into the Plan area, from the south through Southlake Moor. However, this may alter with the implementation of the Drainage Board's scheme as water will be penned in Southlake Moor to achieve favourable condition. Therefore, the Environment Agency may have to allow more water through Burrow Wall Rhyne, than previously to provide an adequate and continuous feed to the rest of the Plan area.

### 9.6. Proposed changes to maintenance practices

**Proposal 16: The Environment Agency, in consultation with the Parrett Drainage Board, will complete its review of the routine maintenance of the Main Rivers.**

Reason: The Environment Agency, in consultation with the Parrett Drainage Board, is currently reviewing the routine maintenance of Main Rivers within the Plan area in the response to changing priorities. This relates specifically to a national risk based approach where the highest standards of maintenance are directed to where they are most needed to protect people and property.

**Proposal 17: The Environment Agency, in consultation with the Parrett IDB, will review the non-routine maintenance of Main Rivers, including de-silting, in and adjacent to the Plan area so that the watercourses provide the conveyance that best meets the agreed objectives for the area and is compatible with environmental and other obligations.**

Reasons: The Environment Agency and the Parrett Drainage Board are currently reviewing the non-routine maintenance of Main Rivers within the Plan area in the response to changing priorities. This relates specifically to a national risk based approach where the highest standards of maintenance are directed to where they are most needed to protect people and property. The Parrett carries a heavy load of estuarine silt on each tide and the merits and cost effectiveness of de-silting the tidal Parrett has been debated by drainage engineers for many years. The King's Sedgemoor Drain is not tidal but silt also accumulates in this Main River over time. The value of non-routine de-silting of Main Rivers is being studied by the Environment Agency.

**Proposal 18: The Parrett IDB and the Environment Agency will review the levels of the southern (left) bank of the King's Sedgemoor Drain and the latter will seek to raise any spots that are below the intended design level.**

Reasons: In recent years, high levels in the King's Sedgemoor Drain have been over-topping the left spoil or flood bank, leading to flooding in the area. This suggests the left bank may have sunk below its intended design or service level.

## 10. Other proposed actions

It is anticipated that an ongoing monitoring programme of long-term changes in the plant and animal communities of the Levels and Moors will be undertaken by Natural England and others and used in combination with Environment Agency and Parrett IDB environmental data, and local knowledge, to inform and refine decisions regarding suitable water levels in the future.

# 11. Unresolved matters

The potential effects of climate change and sea level rise on the Plan area are unclear at present. Current studies by the Environment Agency, and others, should inform the Parrett IDB on these matters and the mitigation or adaptation required in water management to accommodate these impacts. There are no other unresolved matters regarding this Water Level Management Plan.

# 12. Contingency measures

## 12.1. Flooding

The Environment Agency will carry out active monitoring of raised flood banks during high flows, and ensure that outfall structures are kept clear of debris to allow evacuation of flood water as safe working conditions allow. The Environment Agency will also carry out emergency works as required to protect people and property.

The Environment Agency and the Parrett Drainage Board are currently discussing the benefits of pre-emptive lowering of Main Rivers. In the event of extreme weather conditions, especially in summer, it has been suggested that early action at certain control structures may reduce the severity of damage caused by overland flooding at critical times of the year. This joint work is currently in the early stages of investigation.

The Parrett IDB will ensure that all weed-screens on Viewed Rhynes are cleared on an ‘as required basis’ and that watercourses are running freely to assist the evacuation of flood water as soon as is reasonably possible.

In an extreme event Southlake Moor will flood naturally when the banks of the Sowy and Challis Wall overtop. A controlled evacuation of flood water can be managed through the Southlake Inlet into the Sowy, and via the A361 sluice into the Penzoy.

During a flood event the Environment Agency may need to use Southlake Reservoir for floodwater storage, to minimise flood risk in the area. This decision will be made in consultation with the Drainage Board and others.

## 12.2. Drought

During a drought situation the Environment Agency will encourage the public and industry to practice water efficiency and conserve water, whilst all abstraction licence holders will be encouraged to minimise water abstraction. There will be close liaison with between the Environment Agency and IDBs to conserve what water is available and to ensure its fair distribution between all occupiers so far as possible.

If there is an exceptional shortage of rain, and a serious deficiency in the supply of water, or a deficiency in flows or low water levels that threatens flora or fauna, drought permits or orders may be issued.

Drought permits are applied for by the Water Companies and issued by the Environment Agency to enable companies to take water from new sources or to alter restrictions on existing abstractions. Drought orders, issued by the Secretary of State, go further and restrict the non-essential use of water.

Close liaison will be maintained between the Parrett Drainage Board and the Environment Agency to conserve what water is available and to ensure its fair distribution between all occupiers so far as possible.

### 12.3. Pollution

In the event of a pollution incident being noted, assistance will be sought immediately from the Environment Agency's incident pollution hotline on 0800 80 70 60.

## 13. Monitoring arrangements

Several organisations are involved in monitoring environmental information that is relevant to the Water Level Management Plan, as set out in Table 19.

**Table 19: Monitoring arrangements for Othery, Middlezoy, Westonzoyland and Chedzoy**

| Lead body | Topic of monitoring |
|---|---|
| Parrett IDB | • Target water levels at key IDB control structures;<br>• Maintenance of Viewed Rhynes;<br>• Monitoring channel profiles and conveyance in Viewed Rhynes;<br>• Maintenance of minor watercourses, farmers ditches etc. |
| Environment Agency | • Target water levels at key Agency control structures;<br>• Maintenance of Main Rivers;<br>• Monitoring channel profiles and conveyance in Main Rivers;<br>• Catchment rainfall and weather events. |
| Natural England | • Plant and animal communities;<br>• Land management for conservation. |

## 14. Amendments agreed during the period of the Plan

Amendments to this Plan which are agreed by Drainage Board, the Environment Agency and Natural England are set out in Table 20.

**Table 20: Amendments agreed during the period of the Plan**

| No. | Date | Amendment | Agreed |
|---|---|---|---|
| | | | |
| | | | |

## 15. Review arrangements

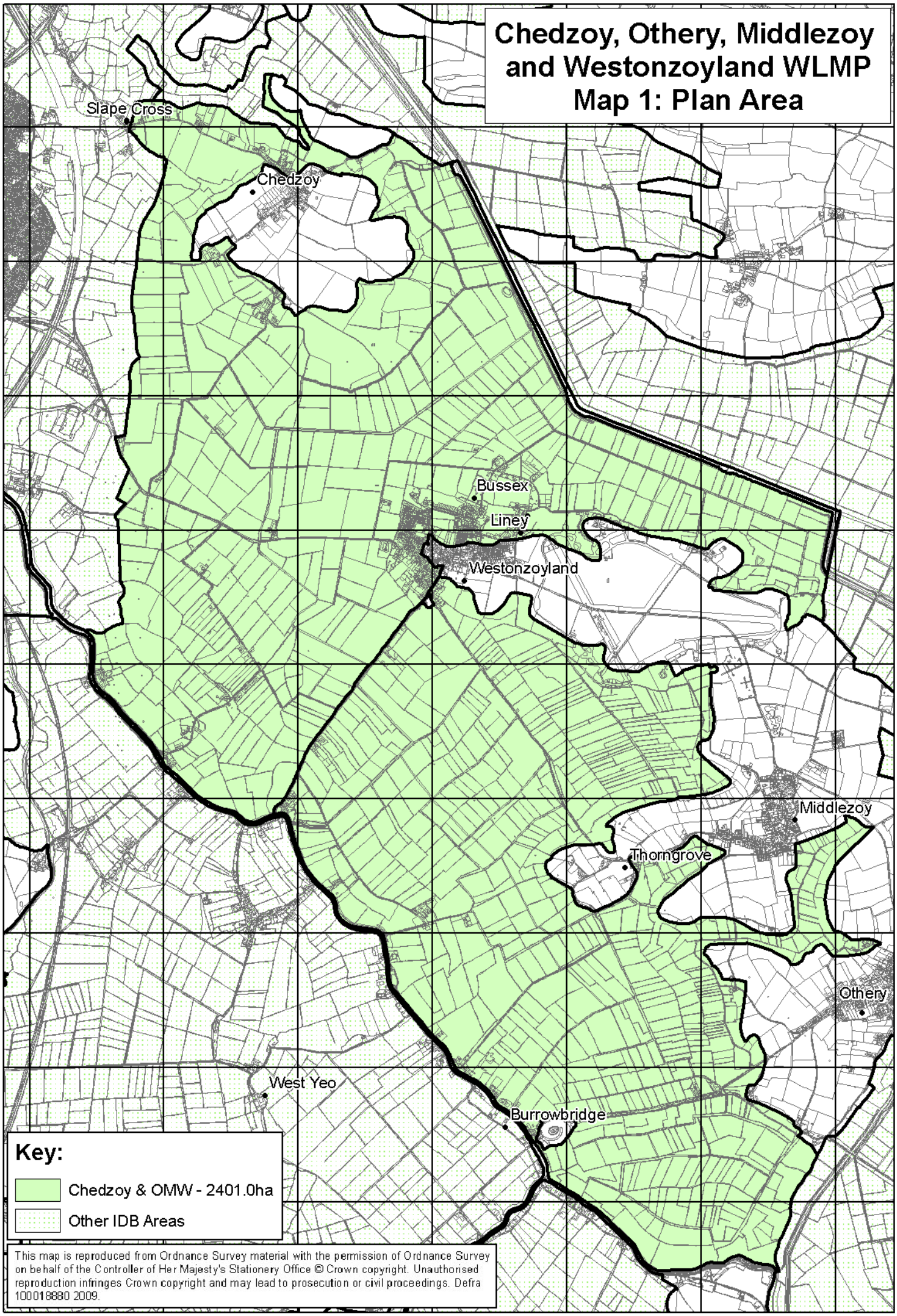
The Parrett IDB proposes to review this WLMP in 2014, five years after it has been adopted. If any alterations to operating procedures or maintenance are required before 2014, these will be discussed by the IDB, the Environment Agency and Natural England and can agreed as interim measures pending the full review.

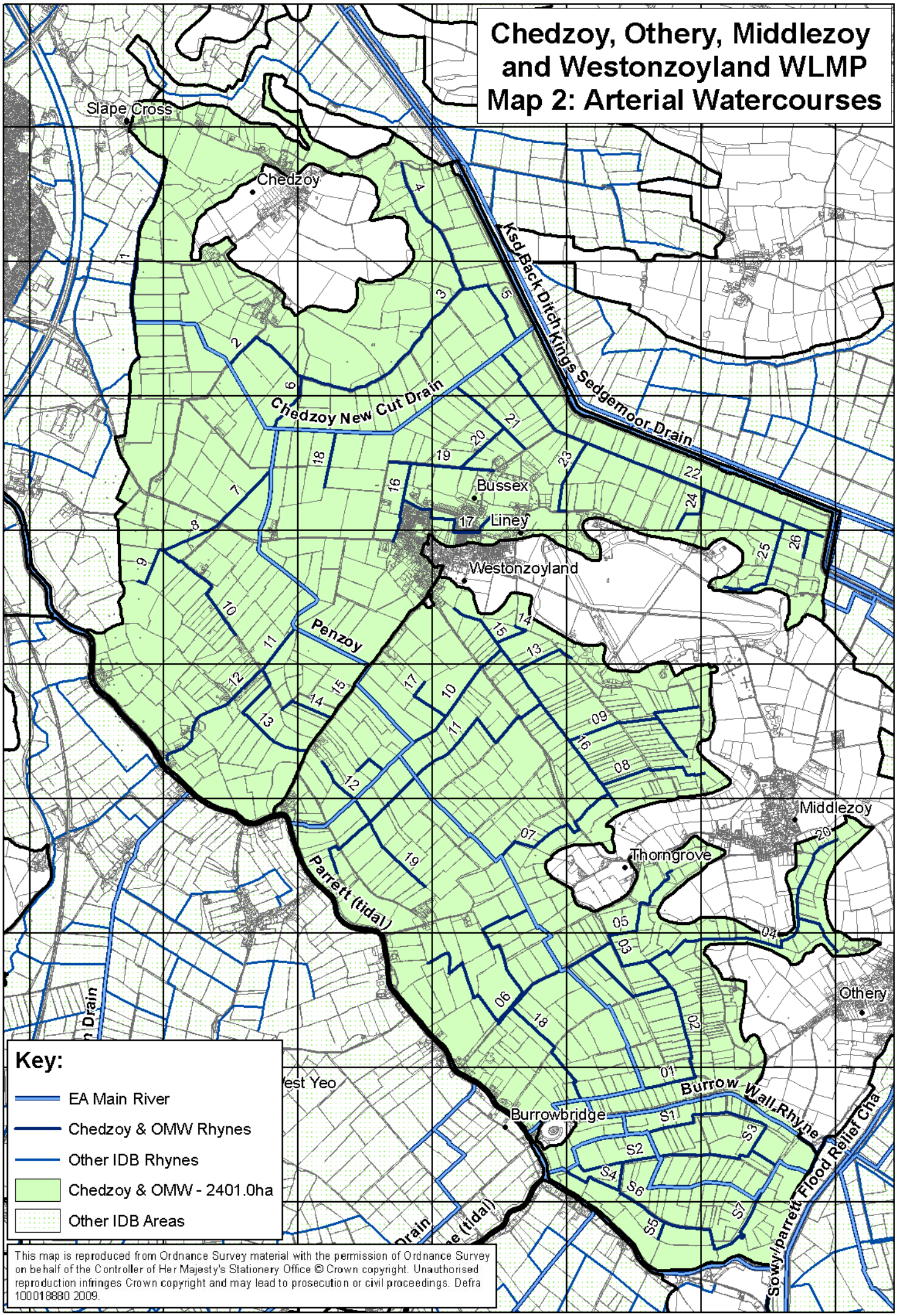
# 16. Timetable of actions: Othery, Middlezoy, Westonzoyland and Chedzoy WLMP

| | | |
|---|---|---|
| | **Proposed continuation of current good practice** | |
| 1: | The current summer and winter penning levels in the watercourses of Langmead and Weston Level SSSI will continue to be maintained by the Drainage Board. | **Ongoing** |
| 2: | The current spring, summer and autumn penning levels in the watercourses of Southlake Moor SSSI will continue to be maintained by the Drainage Board. | **Ongoing** |
| 3: | The current summer and winter penning levels in the other watercourses of the Plan area outside the designated sites will continue to be maintained by the Drainage Board. | **Ongoing** |
| 4: | The current maintenance of the Viewed Rhynes will continue to be undertaken by the Drainage Board. | **Ongoing** |
| | **Proposed changes to water control infrastructure** | |
| 5: | Further capital improvement works (Phase 2) will be carried out by the Parrett IDB to help achieve favourable condition on Southlake Moor SSSI. | **2009** (complete by end 2011) |
| 6: | Capital improvement works will be carried out by the Parrett IDB in the Plan area for Health and Safety reasons. | **2009** (complete by end 2010) |
| 7: | The Drainage Board and the Environment Agency will review the operation of Chedzoy Clyce and Lake Wall Flap Valve. | **Complete by end 2010** |
| 8: | Additional gauge boards and telemetry stations will be installed by the Parrett IDB in the Plan area. | **2009** (complete by end 2010) |
| | **Proposed changes to target water levels** | |
| 9: | In Southlake Moor SSSI, the Parrett Drainage Board will trial the target winter water levels set out in Table 16 during winter 2009-10 providing (a) these levels are agreed by the owners and occupiers of the significant majority of the land affected, and (b) these levels are compatible with any agri-environment scheme agreements that exist on the significant majority of the land affected. | **Winter 2009** As detailed in plan |
| 10: | In Southlake Moor SSSI, the Parrett IDB will trial the target winter water levels set out in Table 17 for a period of 2 – 5 years starting in winter 2010-11 providing (a) these levels are agreed by the owners and occupiers of the significant majority of the land affected, and (b) these levels are compatible with any agri-environment scheme agreements that exist on the significant majority of the land affected. | **Winter 2010** As detailed in plan |

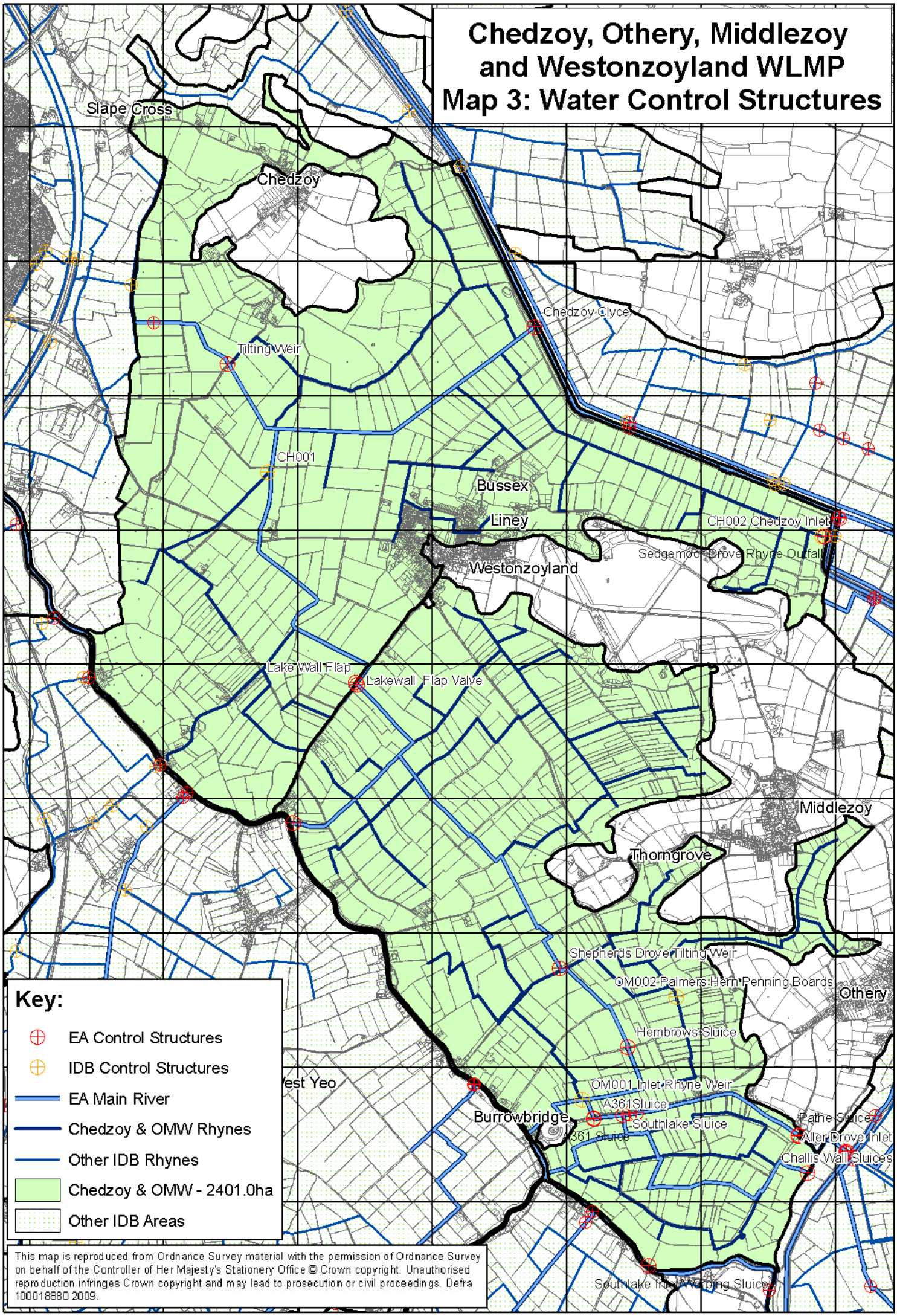
# 16. Timetable of actions (continued): Othery, Middlezoy, Westonzoyland and Chedzoy WLMP

| | | |
|---|---|---|
| | **Proposed changes to operational procedures** | |
| 11: | The Parrett IDB will change the winter operation of key control structures to implement Proposal 9. | **Winter 2009** As detailed in plan |
| 12: | The Parrett IDB will change the operation of key control structures on Southlake Moor SSSI to achieve the summer pen levels as described in Table 11. | **Summer 2009** As detailed in plan |
| 13: | The Environment Agency will complete its review of the operation of Dunball Sluice and in consultation with the IDB will agree the conditions when water levels in the King's Sedgemoor Drain can be lowered in advance of floodwater arriving at the Sluice in order to reduce the risk of damage being caused by the anticipated flood. | **Complete by end 2010** |
| 14: | The Parrett IDB will adopt the principle that (a) a 'normal operating date' lies within two weeks of the date given in the Plan, and (b) a 'normal water level' lies within 50mm of the level specified within the Plan, unless the Plan indicates otherwise. | **Immediate** |
| | **Proposed changes to operational responsibilities** | |
| 15: | The Parrett IDB and the Environment Agency will resolve the proposed changes in ownership and responsibility of selected water control structures and watercourses in the Plan area. | **Summer 2009** Operational changes<br>**Completed 2010** Ownership resolved |
| | **Proposed changes to maintenance practices** | |
| 16: | The Environment Agency, in consultation with the Parrett Drainage Board, will complete its review of the routine maintenance of the Main Rivers. | **Complete by end 2010** |
| 17: | The Environment Agency, in consultation with the Parrett IDB, will review the non-routine maintenance of Main Rivers, including de-silting, in and adjacent to the Plan area so that the watercourses provide the conveyance that best meets the agreed objectives for the area and is compatible with environmental and other obligations. | **Complete by end 2010** |
| 18: | The Parrett IDB and the Environment Agency will review the levels of the southern (left) bank of the King's Sedgemoor Drain and the latter will seek to raise any spots that are below the intended design level. | **Complete by end 2010** |


Chedzoy, Othery, Middlezoy and Westonzoyland WLMP
Map 1: Plan Area
Slape Cross
Chedzoy
Bussex
Liney
Westonzoyland
Middlezoy
Thorngrove
Othery
West Yeo
Burrowbridge
Key:
Chedzoy & OMW - 2401.0ha
Other IDB Areas
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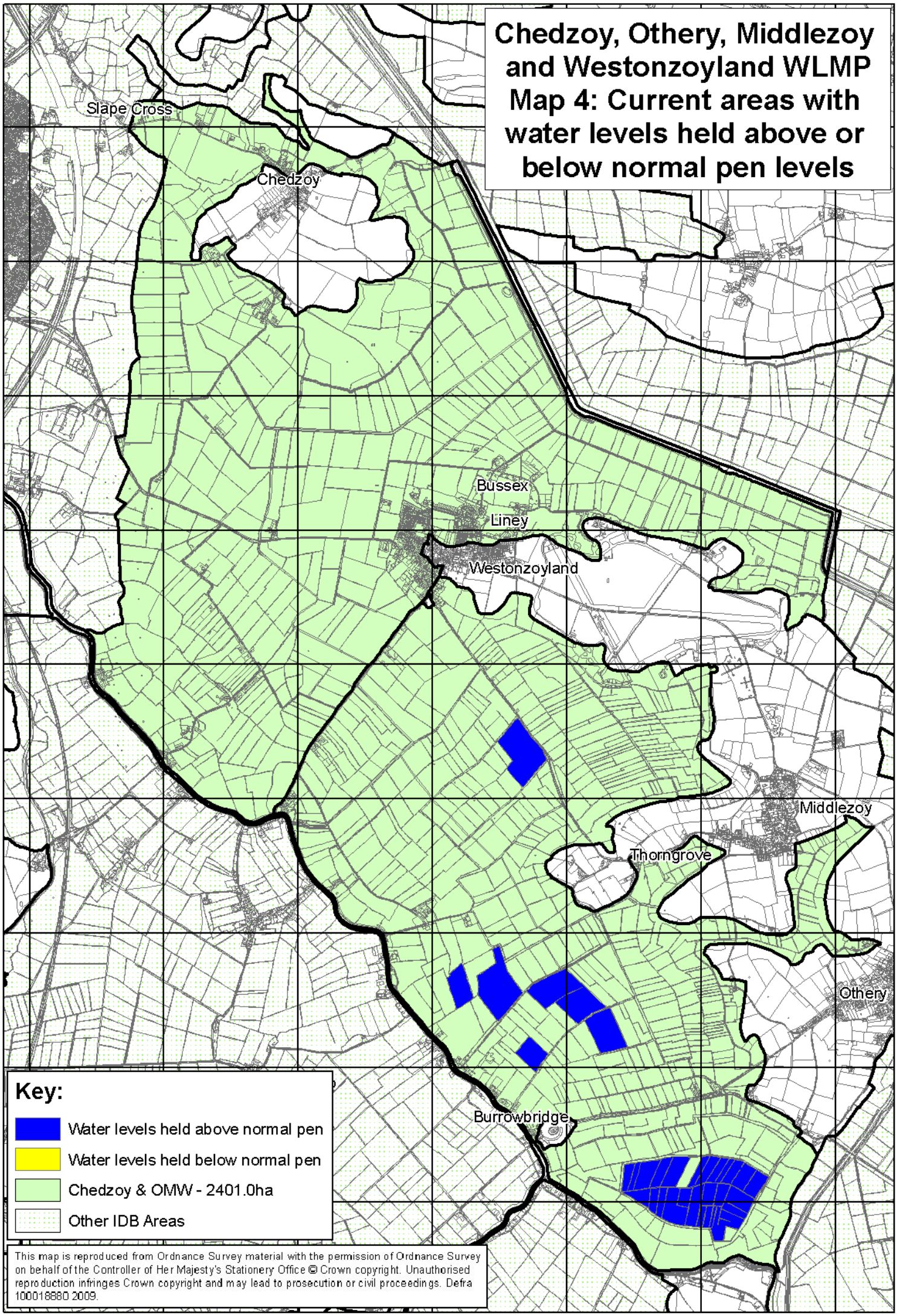



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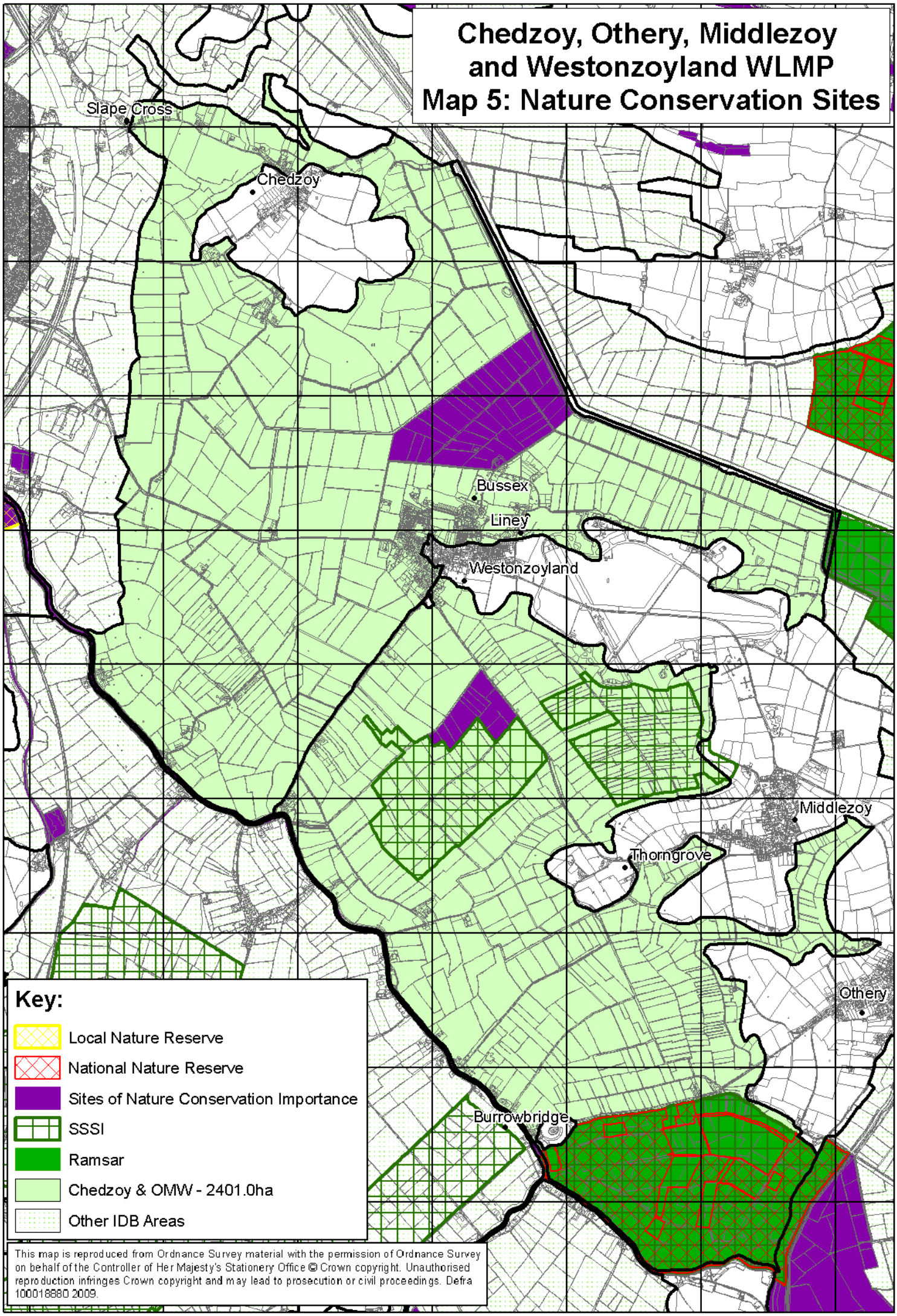

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# Chedzoy, Othery, Middlezoy and Westonzoyland WLMP Map 4: Current areas with water levels held above or below normal pen levels



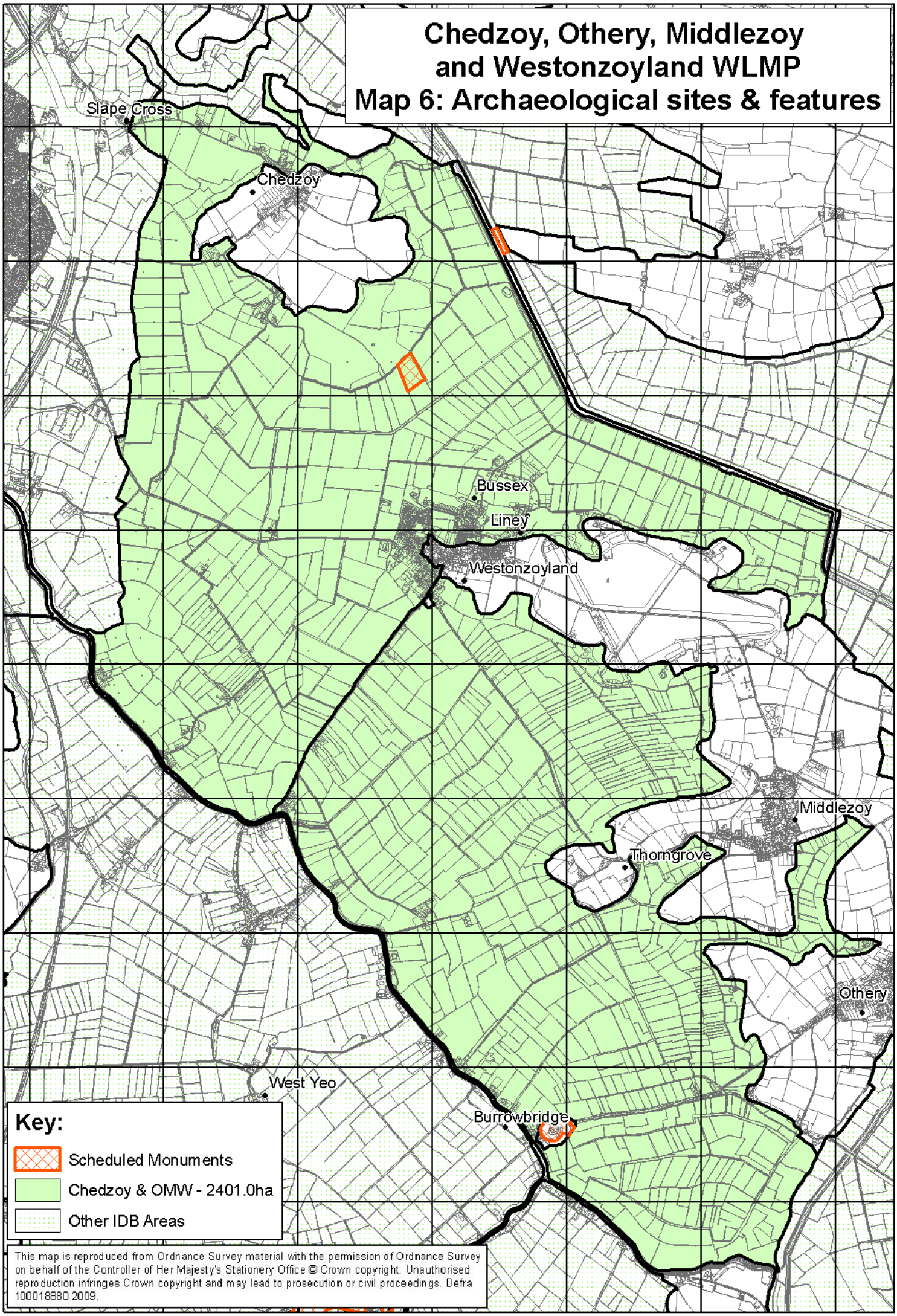

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# Chedzoy, Othery, Middlezoy and Westonzoyland WLMP
# Map 5: Nature Conservation Sites



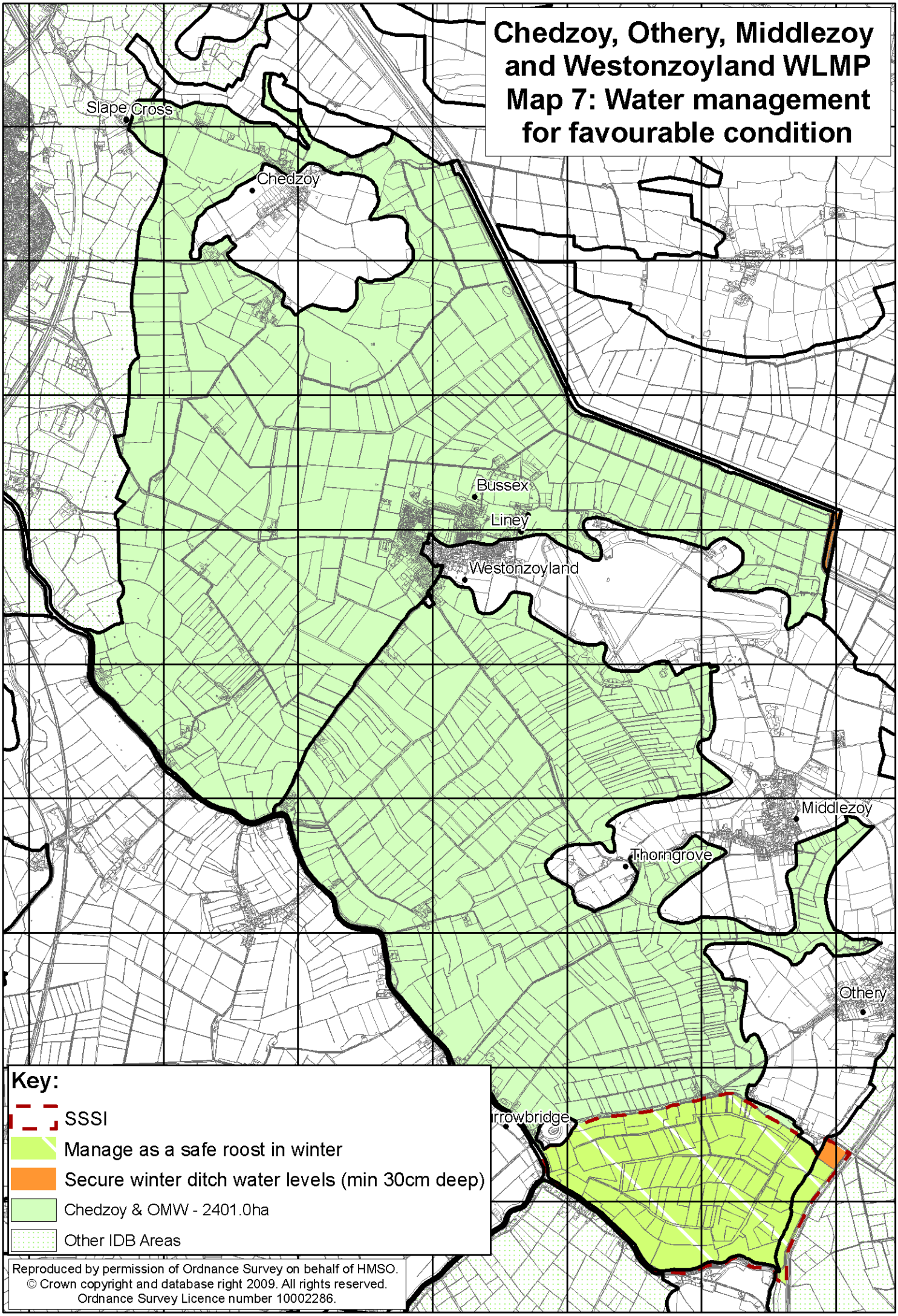

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# Chedzoy, Othery, Middlezoy and Westonzoyland WLMP
# Map 6: Archaeological sites & features




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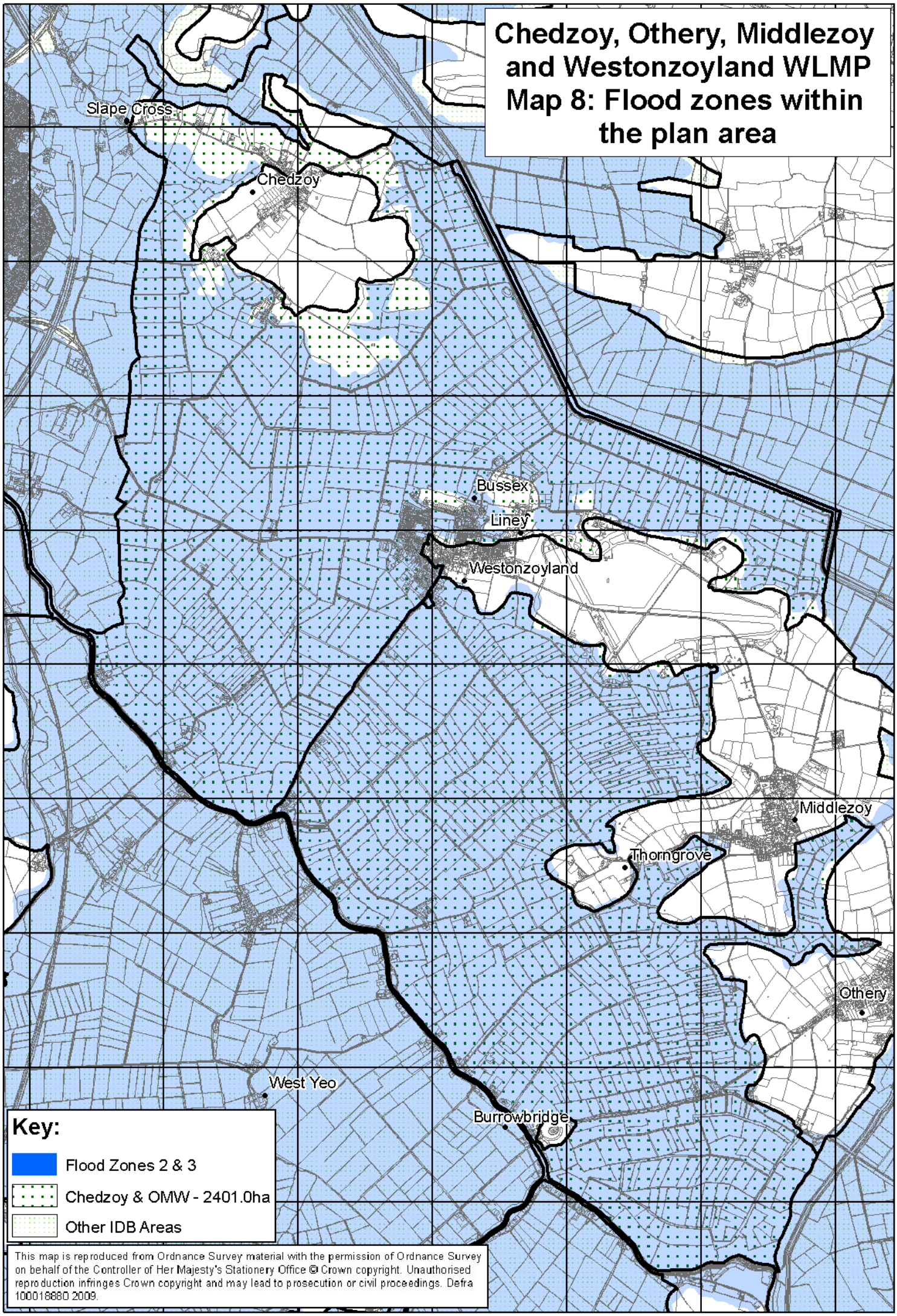
# Chedzoy, Othery, Middlezoy and Westonzoyland WLMP Map 7: Water management for favourable condition



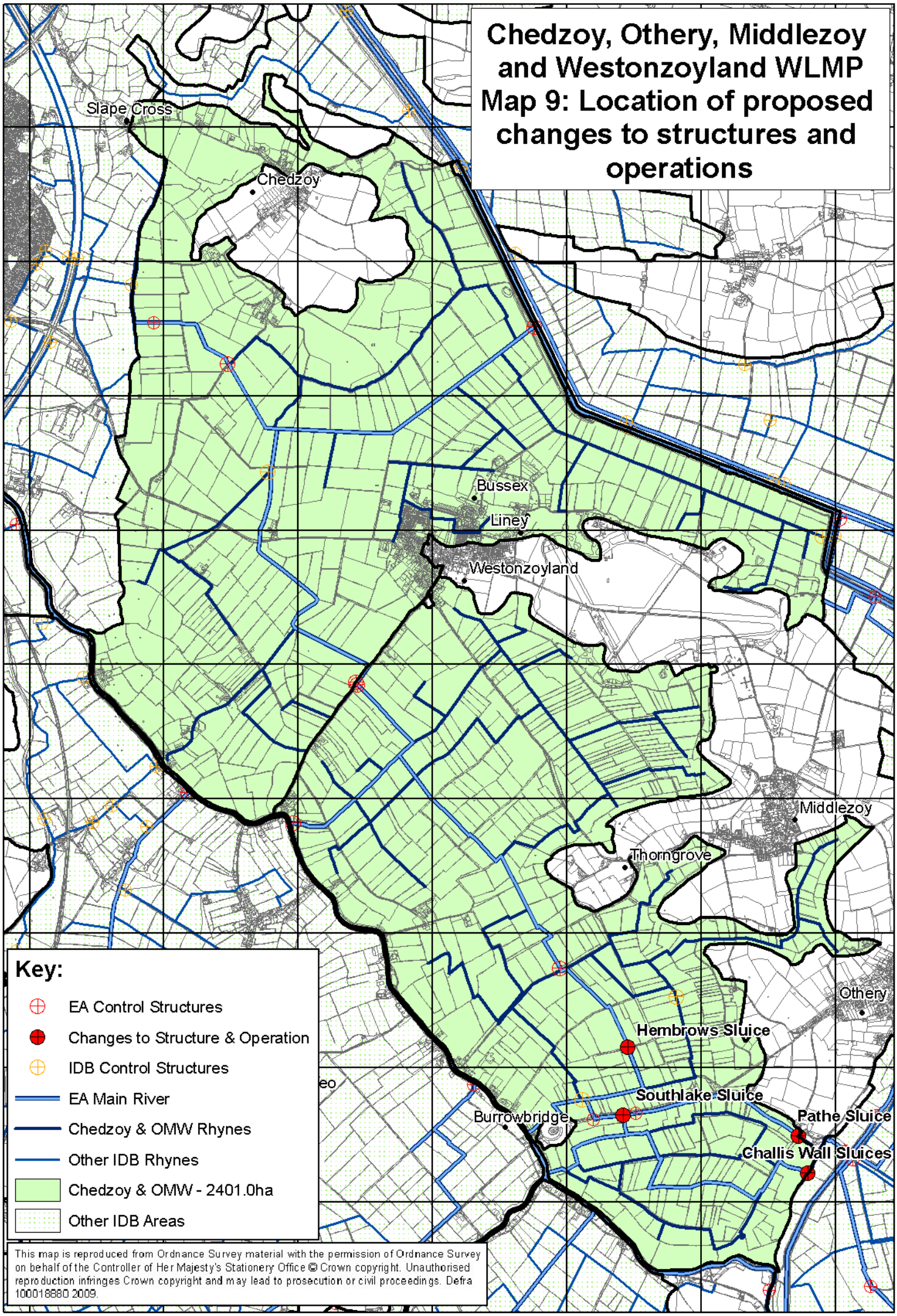

**Key:**

- SSSI
- Manage as a safe roost in winter
- Secure winter ditch water levels (min 30cm deep)
- Chedzoy & OMW - 2401.0ha
- Other IDB Areas

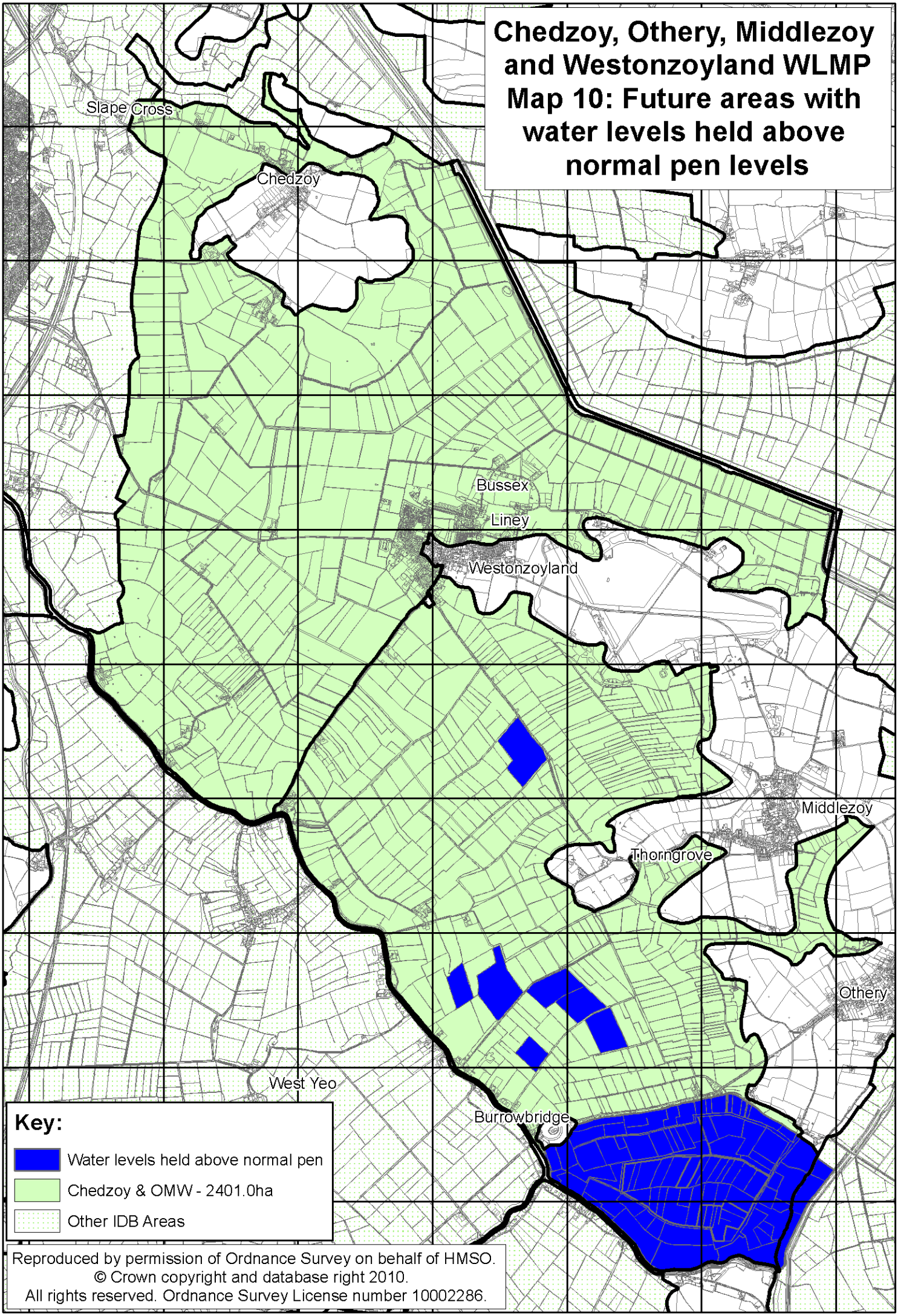
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