West Moor Water Level Management Plan

Parrett Internal Drainage Board

Approved July 2010

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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 West Moor 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	West Moor (Parrett IDB)
SSSI(s) covered	West Moor 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 – Parrett Drainage Board	Peter Maltby		
Area Manager – Environment Agency	Nick Gupta		
Area Manager – 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 water level management is important for the maintenance, or rehabilitation, of that interest (e.g. Sites of Special Scientific Interest (SSSIs), Special Protection Areas and Ramsar sites). WLMPs also provide a framework for balancing and integrating the water level requirements of agriculture, recreation, flood risk and conservation within an area.

Natural England is responsible for assessing the condition of SSSIs and has identified a number of wetland SSSIs in Somerset where changes in water level management are required to achieve favourable condition for each site (see Box 2). One of these sites is within the area covered by this Plan:

- West Moor SSSI (213ha)

In 2007, the Parrett IDB extended the existing Raised Water Level Area on West Moor and the SSSI is now in favourable, or recovering, condition.

The activities of the Parrett IDB play an important role in maintaining a healthy natural environment in Somerset and the IDB acknowledges its statutory duties to nature conservation under the Land Drainage Act (1991), the Conservation (Natural Habitats etc) Regulations (1994), the Countryside and Rights of Way Act (2000) and the Natural England and Rural Communities Act (2006). This WLMP will assist the Parrett IDB in carrying out its nature conservation duties and help provide appropriate water level management required to achieve favourable condition for the West Moor SSSI. It will also help ensure effective management measures are in place to resolve problems and protect and sustain valued features of the Plan area.

2.2. Plan area

The Plan area covers 1331 acres (541 hectares) of the former Langport Drainage BoardDistrict that now forms part of the area managed by the Parrett IDB. The location and extent of the Plan area is shown on Map 1.

The Plan area is bounded to the north-east by the River Parrett, to the north-west by the Westport Canal and the higher ground around Midleney, and to the south by the higher ground around Burrow Hill and the villages of Stembridge and Kingsbury Episcopi.

South Moor, to the north of the Plan area, drains into the West Moor Main Drain via a tunnel under the Isle (Midelney Tunnel) and is therefore affected by water levels in the West Moor Plan area. South Moor can also drain into the River Parrett downstream of the confluence with the Isle at South Moor Outfall.

2.3. Responsibility for preparation and implementation of the Plan

The Parrett IDB 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 South Somerset District Council. Each Drainage Authority has contributed information to enable the WLMP to be produced by the Parrett IDB. The end result is a collaborative effort by all the

Authorities. Each Drainage Authority is responsible for implementing and monitoring their own actions within the WLMP and for reporting on these matters to the Parrett IDB 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 WLMP was considered by the Parrett IDB WLMP Committee in September 2009 and was endorsed for purposes of consultation with drainage ratepayers, Statutory Bodies and other organisations. Consultation on the WLMP took place during a four week period in December 2009.

Consultation responses, and any amendments to the WLMP arising from the consultation, were considered by the Parrett IDB WLMP Committee before recommending the WLMP for approval by the Full Parrett Board in July 2010.

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 bordering the left bank of the River Parrett. The land surface varies from levels of 8m above Ordnance Datum Newlyn (ODN) near the river to 6m ODN further inland. Water is generally prevented from inundating the low lying land by embankments along the left bank of the River Parrett and the right bank of the River Isle, with crest levels between 8m and 9m ODN.

3.2. Water supply

The mean annual rainfall between 1999 and 2007 for West Moor was 681mm. This figure was calculated using the Environment Agency rain gauge at Muchelney (Thorney Lake).

The embanked River Parrett and River Isle act as upland water carriers conveying water from the upstream catchment through the low moorland area. Water is fed into the Plan area during the summer months from the River Parrett at Coombe Bridge Inlet and from the River Isle at Slabgate Inlet. Water was once fed from the Isle through Shuttle Wall Inlet but this structure is no longer operated. Water is also fed into the area via the West Moor Catchwater, which splits in two and flows north, parallel to the Westport Canal, and east, following the southern and then eastern boundary of the Plan area until its outfall to the Parrett at West Moor Catchwater Outfall. The West Moor Catchwater feeds the West Moor Main Drain which flows through the centre of the Plan area.

The West Moor Main Drain was once fed from the Westport Canal via a culvert, however, the Canal now holds very little water (it is penned at Middlemoor Bridge) and the culvert is redundant. In flood conditions, overspill from the Canal still feeds the Plan area. Water management in the West Moor catchment is ultimately provided by the Midelney Pumping Station.

Water management in the summer is mostly focused on the supply of water to the rhyne and ditch system and the maintenance of high ditch water levels for farming and conservation, except during periods of heavy rainfall when there is a risk of flooding. From early April to the end of November, sluice gates and penning boards are operated to raise water levels in the rhynes and ditches to summer pen levels. The maintenance of summer levels is 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.

Details of the water supply inlets to the Plan area are given in Section 3.7.1 and the locations of structures are shown on Map 3.

3.3. Drainage

Water from the West Moor Plan area drains into West Moor Main Drain and is pumped into the River Isle via Midelney Pumping Station which discharges upstream of the Isle and Parrett confluence. Water from South Moor drains into West Moor Main Drain via Midelney Tunnel and is also pumped through Midelney Pumping Station.

In floods the inlets are closed and the Pumping Station is used to evacuate water from the moor. The operation of the Station is dependent on the level in the Isle / Parrett and the extent of flooding in the downstream moorland area. Following a flood the West Moor Gravity Outfall may be used to help relieve flood water from the moor if the level of the Isle / Parrett is suitable.

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

3.4. Asset management systems

The Environment Agency manages its assets using a Flood Risk Management (FRM) system approach. 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 system has its own specific Management Plan.

Performance specifications are given to each system to guide maintenance standards. The maintenance works are then carried out by the Environment Agency's Operations Delivery Team. This process is used to direct the highest standards of maintenance to where they are needed most (i.e. people, property and environment) using a risk based approach. The Environment Agency has adopted three categories to prioritise maintenance for each FRM system:

- **High** – Generally urban areas with high populations or rural areas with high environmental designations.
- **Medium** – Urban to rural areas with relatively low population densities.
- **Low** – Sparsely populated areas and agricultural land.

The FRM system that covers the whole the West Moor WLMP area is:

- **FR/14/S046 West Moor & South Moor (High)**

The West Moor & South Moor FRM system has been categorised as a high priority system because of the high environmental designations of the adjoining land and the importance of water management to these environmental assets.

There are a two other FRM systems which may affect the West Moor area:

- **FR/14/S045 River Isle (Low)**
- **FR/14/S034 Parrett LB Langport to Thorney (Medium)**

Each Environment Agency maintained 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.

The Parrett IDB manages its assets in the Plan area under a comparable asset 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 Catchment Flood Management Plan* - A summary version is available on the Environment Agency website.
- *Catchment Abstraction Management Strategies (CAMS)* - These documents are currently being revised for re-release in 2011.
- *Mid Parrett, Isle & Yeo Study* - Completed in March 2007.
- *Lower Parrett & Tone Flood Management Strategy* - Working Draft prepared in February 2005.
- *Parrett and Tone Channel Monitoring Project 2008-09.*
- *Water Framework Directive* and *South West River Basin Management Plan* - The plan is available on the Environment Agency website.

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 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 CFMP was produced in 2008 and will be reviewed every six years.

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 to deliver benefits locally and elsewhere. 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 the existing embankments and infrastructure.

3.5.2. Catchment Abstraction Management Strategy

The Environment Agency has developed Catchment Abstraction Management Strategies (CAMS) to assess the water availability in catchments and to ensure water resources are managed sustainably. As the Levels and Moors are penned systems, the current Strategy for the Parrett catchment (published March 2006) was unable to accurately assess the water requirements for these areas, and therefore the availability of water for abstraction. To address this problem the Environment Agency is preparing a new CAMS for the Levels and Moors, which is due for completion by February 2011. The aim of the new Strategy will be to identify what water may be available for abstraction and set an appropriate abstraction licensing policy for those rivers that are influenced by the inlets and outlets from penned systems. The new CAMS will not seek to change the water levels within penned systems, and will assume that the water levels stated in the WLMPs are appropriate. If the CAMS identifies that there is surplus water available in the catchment, then it will also consider how much of this water is available for new abstraction licences. Where over abstraction is identified it will consider what actions are necessary to redress the balance.

3.5.3. Mid Parrett, Isle & Yeo Study

This study considered flood management for the Rivers Parrett, Isle and Yeo upstream of Langport and was commissioned to assess the scope for improvements to the flood management infrastructure and to guide proactive and reactive maintenance in the future. The

study examined flood management practices, the impact on flood risk elsewhere, and included a review of embankments and pumping stations.

3.5.4. Lower Parrett & Tone Flood Management Strategy

This draft report looks at the long term flood management of the River Parrett and the River Tone downstream of Taunton and Langport. The strategic aim is to achieve sustainable flood management within the area, minimise the impact on communities and maximise opportunities for wildlife and other local interests. Most of the area has a significant risk of flooding from either fluvial and / or tidal sources. Embankments provide most of the flood protection in the area and there is an increasing risk of breaching due to bank condition and climate change. Various options have been recommended for further study.

3.5.5. Parrett and Tone Channel Monitoring Project

The Environment Agency is currently undertaking a study on the River Parrett and River Tone to monitor and assess the success of dredging work that was carried out between 2002 and 2005. The study area on the Tone is from the Parrett confluence to New Bridge and on the Parrett from Oath Lock downstream to the M5 flyover. New bathymetric surveys will be undertaken to gauge the current profile of the river channels. This data will then be meshed together with LiDAR data in order to obtain accurate cross sections. Once these cross sections are in place, the Environment Agency intends to reuse the existing Parrett / Sowy hydraulic model to replicate the current profile of the Parrett and Tone. The Environment Agency will then model alternative scenarios to determine the need for a programme of de-silting that maximises flood alleviation and optimises the performance and sustainability of the channels.

3.6. Watercourses

3.6.1. Main Rivers

The Environment Agency has permissive powers to manage designated Main Rivers to reduce flooding of property and risk to human life. There are five Main Rivers within the West Moor Plan area: the River Parrett, River Isle, West Moor Main Drain, Westport Canal and South Moor Main Drain. Summary details of the Main Rivers affecting West Moor are set out in Table 1 and their locations are shown on Map 2. The control structures on these watercourses are listed in Tables 2 – 4.

3.6.2. IDB watercourses

The Parrett IDB is responsible for maintaining a network of arterial watercourses in the Plan area known as ‘Viewed Rhynes’. Watercourses can be taken into, or out of, view by resolution of the Board. There are over 25 kilometres of IDB maintained Viewed Rhynes in the Plan area. Summary details of the Viewed Rhynes for West Moor are set out in Table 1 and their locations are shown on Map 2. The control structures on these watercourses are listed in Tables 2 – 4.

3.6.3. Private ditches

In addition to the Main Rivers and Viewed Rhynes, private ditches occur throughout the Plan area and the responsibility for maintenance of these watercourses lies with 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 as habitats for a substantial part of the biodiversity interest of the Plan area.

Table 1: Schedule of arterial watercourses in West Moor

Asset no.	Watercourse	Operating authority	Length (m)	Location & connections	Current maintenance regime	Control structures (see Tables 2 - 5)
8750	River Parrett	EA	62000 approx	Originating in South Perrott and flowing north the Parrett forms the eastern boundary of the plan area from Kingsbury Episcopi to Midelney Pumping Station before continuing north and eventually reaching the coast near Bridgwater.	Between Midelney Pumping Station and Thorney W6(FB) specification is used once annually in August.	Oath Lock Sluice Thorney Mill Coombe Bridge Inlet West Moor Catchwater Outlet
8871	River Isle	EA	22000 approx	Originating from the Card Reservoir, the Isle flows in a northerly direction turning east at Isle Brewers. The Isle continues past Muchelney and the plan area before its confluence with the Parrett downstream of Midelney.	Between Midelney and Westport canal W7 (FB) maintenance specification is used, from Westport Canal to Ilford Bridges (B3561) and Ilford Bridges and the A303 W3 maintenance specification is used.	Midelney Lock Shuttle Wall Inlet (Structure B) South Moor Inlet South Moor Catchwater Outlet Slabgate Weir Slabgate Inlets
8882	West Moor Main Drain	EA	2760	It originates at the Westport Canal at Westport and flows for 5.6km though the West Moor Plan area to the Midelney Pumping Station.	W3 specification twice annually in July and September subject to review	Midelney Pumping Station West Moor Main Drain Gravity Outlet
8910	Westport Canal	EA	3200	Originating at Westport the river flows north, east of Hambridge to its confluence with the Isle downstream.	W2 specification once annually in September subject to review. The footpath parallel to the Canal is flailed once a month.	Middlemoor Bridge Flap Informal Spillway
8881	South Moor Main Drain	EA	1390	The South Moor Main Drain flows parallel to the Isle from Midelney Bridge to the Midelney Tunnel and ultimately the Midelney Pumping Station.	W3 specification once or twice annually depending on review from July onwards.	Midelney Tunnel (Sluice)

Table 1 (continued): Schedule of arterial watercourses in West Moor

Asset no.	Watercourse	Operating authority	Length (m)	Location & connections	Current maintenance regime	Control structures (see Tables 2 - 5)
24	Westmoor Catchwater – Thorney to Pulpits Way Drove	IDB	2434	In three sections. Eastern section follows the edge of the high ground around Kingsbury running north to Thorney Inlet Sluice. Southern section is a short length which connects to the eastern end of Lot 25. South west section connects the western end of Lot 25 with the eastern end of Lot 26.	W1	Hitchings Rhyne Spillway (LG010)
25	Westmoor Catchwater – Palmers End Drove to New Road	IDB	1366	Follows part of southern boundary of Plan area from Palmers End Drove (connection with Lot 24) westwards to New Road (connection with Lot 24).	W1	None
26	Westmoor Catchwater – New RODN to Knighton	IDB	1734	Follows part of south west boundary of Plan area from Westport, eastwards to connect with Westmoor Main Drain.	W1	Knighton sluice (LG005)
27	Westmoor Catchwater – New Road to Midelney	IDB	2664	Follows northern boundary of Plan area, from New Road in the west around high ground of Ham Green and Midelney to connect with Lot 28 to the north east.	W1	Flap Valve E (LG012) Penstock A (LG015) Stop-log S1 (LG016) Stop-log S2 (LG017) Inlet penstock C (LG018)
28	Westmoor Catchwater – Midelney to Pump Station	IDB	1650	In north east of Plan area, connects with Lot 27 in the south west, Inlet B near Midelney Pumping Station, with a spur connection to Westmoor Main Drain at West Moor Penstock.	W1	West Moor Penstock (LG025) Inlet B, Westmoor Catchwater (LG059)
30	South Supply Drain	IDB	1069	Connects with River Parrett in the east, via Coombe Bridge Inlet (LG011, now redundant), with Westmoor Catchwater via the south supply Inlet (LG011), and with Westmoor Main Drain in the west.	W1	South Supply Inlet (LG011) Coombe Bridge Inlet (LG024), redundant
31	Hitching Rhyne & Connection	IDB	2262	Connects with Lot 24 Westmoor Catchwater in the south east, via Hitchings Rhyne Spillway (LG010), and follows a northerly line between Westmoor Main Drain and Lot 24.	W1	Hitchings Rhyne Spillway (LG010)
32	Pitt Bridge	IDB	2098	To the north of Pitt drove in the central part of the Moor, with connections to Westmoor Main Drain.	W1	None
35	Yonder Drove	IDB	1076	Connects to Lot 27 in the north, via Flap Valve E (LG012) and with Westmoor Main Drain in the south.	W1	Flap Valve E (LG012)
36	New Road	IDB	562	Parallel with New Road, connecting with Westmoor Main Drain in the south	W1	None
51	Westmoor Inlet (outside Plan area)	IDB	669	Connects with River Isle in the west, upstream of the Weir (LG028), and with Lot 27 in the east.	W1	River Isle Weir (LG028) Slabgate Inlet (LG029)

3.7. Structures

3.7.1. Structures controlling inflows

A number of structures are used to supply water to the Plan area (Table 2).

Table 2: Structures controlling inflows to West Moor

Inlet	Grid Ref.	Maintained by	Operated by
Slabgate Inlet (outside Plan area) Watercourses: From River Isle into Westmoor Inlet	ST 4011 2220	IDB	IDB
South Moor Inlet Watercourses: From River Isle into South Moor Main Drain	ST 4117 2331	EA	EA
Coombe Bridge Inlet (outside Plan area) Watercourses: From River Parrett into South Supply Drain	ST 4334 2165	IDB	IDB
Shuttle Wall Inlet (Structure B) redundant	ST 4164 2339	EA	EA

3.7.2. Structures controlling outflows

The Midleney Pumping Station is used to control water leaving the Plan area (Table 3). Any proposed changes to these arrangements are set out in Section 9.

Table 3: Structures controlling outflows from West Moor

Outfall	Grid Ref.	Maintained by	Operated by
Midelney (West Moor) Pumping Station Watercourse: Westmoor Main Drain	ST 4171 2352	EA	EA
West Moor Main Drain (Gravity) Outfall Watercourse: Westmoor Main Drain	ST 4171 2357	EA	EA
Thorney Outfall Sluice Watercourse: Westmoor Catchwater	ST 4260 2290	IDB	Not used

3.7.3. Structures controlling water levels within the area

Water control structures that currently are used to maintain water levels within the Plan area are detailed in Table 4.

Table 4: Schedule of control structures affecting water management in West Moor

Asset no.	Control structure	Grid reference	Maintained by	Operated by	Watercourse (see Table 1)	Description	Dimensions & operating range
1122587500402 B01001	Oath Lock Sluice	ST 3831 2787	EA	EA	River Parrett	Sluice	2 vertical lifting gates and a fixed weir on adjacent channel crest level 6.5m approx.
1122587500605 B01002	Thorney Mill	ST 4287 2262	Private	EA	River Parrett	Penning bay and lifting gate	The EA operates on structure here: 4m high x 2.5m wide steel lifting gate, operated by electric actuator connected to telemetry.
112258871010 R01003	Midelney Pumping Station	ST 4171 2352	EA	EA	West Moor Main Drain	Pumping Station	3 automatically controlled, electrically driven 30 inch diameter vertical axel flow pumps with symphonic discharge.
1122587500606 R02001 (LG024)	Coombe Bridge Inlet (Lavers Row Inlet)	ST 4334 2164	Riparian	IDB	River Parrett (South Supply Drain)	Culvert	200mm diameter pipe. Sluices removed by IDB. Water levels here are influenced by the pen at Thorney Mill
1122587500505 L02001	West Moor Catchwater Outlet/ Outfall	ST 4259 2288	EA	EA	River Parrett	Penstocks	This structure is redundant, abandoned in the closed position. Invert level 6.66m ODN
1122588710102 B01001	Midelney Lock	ST 4164 2348	EA	EA	River Isle	Penning bays in two channels of the river	Left channel: vertical lifting gate 6m wide operated by winches. Right channel 10m wide weir spilt into 3 weirs, one fixed crest concrete, two have removable timber penning boards
1122588710102 R02002 (LG059)	Shuttle Wall Inlet (Structure B)	ST 4164 2339	EA	EA	River Isle/IDB Rhyne	Pipe and flap	This structure is redundant. 15m long pipe through floodbank and 0.3m high x x0.3m wide flap.
1122588710104 L01001	South Moor Inlet	ST 4117 2331	EA	EA	River Isle	Penstock	Sluice penstock and a 150mm pipe. Manually operated using a removable handle
1122588710104 L03001	South Moor Catchwater Outlet (Outfall)	ST 4090 2313	EA	EA	River Isle	Pipe and flap	750mm diameter pipe passing through the left flood bank into the Isle. 1m wide cast iron non return flap in concrete headwall
1122588710107 B01002	Slabgate Weir	ST 3999 2214	EA	EA	River Isle	Fixed weir	12.2m long, 0.6m high, fixed crest concrete weir.
1122588710107 R01002 (LG029)	Slabgate Inlets	ST 4010 2219	IDB	IDB	River Isle	Penstocks	2 adjacent penstocks, 1.35m wide x 1.35m with weed screens, against a masonry bridge
1122588710101 R01001	West Moor Main Drain Gravity Outlet	ST 4171 2357	EA	EA	West Moor Main Drain	Penstocks	2 adjacent manually operated steel penstocks, 1.5m wide (This was upgraded in Jan 2009)
1122589100101 B01001	Middlemoor Bridge Flap	ST 4049 2234	EA	-	Westport Canal	Flap	1.52m square metal flap on the d/s side of a 1m wide by 6.5m long stone headwall. Prevents backflows from the Isle entering Westport Canal
112258881010 B0100	Midelney Tunnel Sluice (Midelney Syphon Outlet)	ST 4169 2358	EA	EA	South Moor Main Drain	Penstock	Manually operated penstock sluice 1.2m wide, fixed to the upstream face of the headwall of Midelney Tunnel.

Table 4 (continued): Schedule of control structures affecting water management in West Moor

Asset no.	Control structure	Grid reference	Maintained by	Operated by	Watercourse (see Table 1)	Description	Dimensions & operating range
1122588710101 B01002	Midelney Tunnel (Midelney Syphon)	ST 4169 2358	EA	EA	South Moor Main Drain	Culvert	1.5m diameter culvert running under the Isle liking South Moor to West Moor Main Drain.
1122588810102 B01001	South Moor Sluice	ST 4162 2366	EA	EA	South Moor Main Drain	penstock	Single penstock on the d/s side of a masonry headwall and removable screen (2mx x 0.7m) on the u/s side.
1122587500504 L05003	Old South Moor Outfall (South Moor Gravity Outfall)	ST 4165 2367	EA	EA	South Moor Ditches	pipe	Pipe through the flood bank into the Parrett, now redundant.
	Informal Spillway	ST 4010 2013	Riparian	Riparian	Westport Canal	Informal Spillway	An informal spillway near Hambridge which runs when the Westport Canal overtops, into West Moor.
1122588820103 L01009 (LG015)	Inlet Penstock A	ST 4088 2212	EA	EA	Westmoor Catchwater	Penstock	300mm diameter Ham Baker penstock with non rising spindle & operating wheel with a 300mm diameter, 8m long Armco culvert in a 1.1m high, 4m long steel trenchsheet dam made up of interlocking L8 light piles against earth bank.
1122588820103 L01010 (LG018)	Inlet Penstock C	ST 4148 2244	IDB	IDB	Westmoor Catchwater	Penstock	300mm diameter Ham Baker Gate Valve with operating wheel set in a 1.2m high, 0.5m wide & 2.3 m long headwall made of concrete blocks with a 0.3m diameter, 10m long concrete culvert
1122588820103 L01001	D (Penstock, flap valve and syphon)	ST 4207 2265	IDB	IDB	Safegates Bridge	Penstock	1.2m high, 5m long trenchsheet dam made up of interlocking L8 light piles with a 600mm diameter Ham Baker penstock with operating wheel and a 8m long, 0.5m diameter pipe.
1122588820103 L01016 (LG012)	Flap Valve E	ST 4073 2209	IDB	IDB	Westmoor Catchwater	Flap	150mm square Non Return Valve with a 100mm diameter, 600mm long culvert in a 0.6m thick, 1.5 m high & 5m long stone headwall with concrete crest (capping).
1122588820103 R01002	Flap valve E6	ST 4208 2280	EA	EA	Safegates Bridge	Non return valve	250mm diameter, cast iron double hung Eurovalve non return valve (NRV) on a trenchsheet dam which is 2m high, 6m long
1122588820103 L01011 (LG016)	Westmoor Catchwater Penning Boards (S1)	ST 4107 2212	EA	EA	North of Yonder Drove	Stoplogs	Removable timber stoplogs each 1.25m long, 150mm high forming adjustable weir in a 1.8m high, 6.5m long steel trenchsheet dam.
1122588820103 L01029 (LG017)	Westmoor Catchwater Penning Boards (S2)	ST 4120 2218	EA	EA	North of Yonder Drove	Stoplogs	Removable timber stoplogs each 1.25m long, 150mm high forming adjustable weir in a 1.8m high, 7m long steel trenchsheet dam.
1122588820103 L01013	Yonder Drove Rhyne Penning boards (S3)	ST 4193 2239	EA	EA	East of Yonder Drove	Stoplogs	Removable timber stoplogs each 1.25m long, 150mm high forming adjustable weir in a 2m high, 6m long steel trenchsheet dam.
1122588820103 L01004	Yonder Drove Rhyne Penning Boards (S4)	ST 4209 2247	EA	EA	d/s of Pitt bridge	Stoplogs	Removable timber stoplogs each 1.25m long, 150mm high forming adjustable weir in a 2m high, 7m long steel trenchsheet dam.

Table 4 (continued): Schedule of control structures affecting water management in West Moor

Asset no.	Control structure	Grid reference	Maintained by	Operated by	Watercourse (see Table 1)	Description	Dimensions & operating range
1122588820103 L01014	Old Westmoor Catchwater Penning Boards (S5)	ST 4175 2315	EA	EA	West of Safegates Bridge	Stoplogs	Stoplogs removed
1122588820102 L01003	Westmoor Main Drain Penning Boards (S6)	ST 4184 2323	EA	EA	d/s of Safegates Bridge	Stoplogs	Removable timber stoplogs each 1.25m long, 150mm high forming adjustable weir in a 2m high, 5m long steel trenchsheet dam
	S7	ST 4235 2223	IDB	IDB	RWLA feed	Tilting weir	1m wide tilting weir in steel trenchsheet dam
	S8	ST 4199 2162	IDB	IDB	RWLA feed	Tilting weir	1m wide tilting weir in steel trenchsheet dam
	S9	ST 4157 2218	IDB	IDB	RWLA feed	Tilting weir	1m wide tilting weir in steel trenchsheet dam
	S10	ST 4191 2153	IDB	IDB	RWLA feed	Tilting weir	1m wide tilting weir in steel trenchsheet dam
(LG005)	Knighton Sluice	ST 4402 2070	IDB	IDB	Westmoor Catchwater	Penstock	Steel penstock, 900mm wide, set in a steel frame on masonry walls
(LG010)	Hitchings Rhyne Spillway	ST 4297 2126	IDB	IDB	Hitchings Rhyne & Connection	Spillway	Spillway built of Lias stone
(LG011)	South Supply Inlet	ST 4296 2148	IDB	IDB	South Supply Drain	Penstock	Penstock, 1000mm wide mounted on concrete & masonry headwalls
(LG025)	West Moor Penstock	ST 4206 2265	IDB	IDB	Westmoor Catchwater (lot 28)	Penstock	Penstock, 600mm wide, mounted on trench sheet headwall with outfall pipe to the Main Drain
(LG062)	Thorney Outfall Sluice	ST 4260 2290	IDB	Not used	Westmoor Catchwater (Lot 24)	Penstock	Penstock, fitted to masonry wall. Not used.
(LG064)	Yonder Tilting Weir	ST 40592219	IDB	IDB	Westmoor Catchwater	Tilting weir	1.5m wide tilting weir in steel trenchsheet dam

3.7.4. Gauge boards

The principal gauge boards within the West Moor area are summarised in Table 5. All gauge boards are metric and are levelled to metres above Ordnance Datum Newlyn (ODN) relative to local Ordnance Survey benchmarks.

Table 5: Gauge boards operated in West Moor

Watercourse	Location of gauge board	Grid Reference	Notes	Operator
River Parrett	Westover Pumping Station (d/s)	ST 4160 2650	Main River Main Drain	EA EA
	Thorney Bridge (u/s)	ST 4269 2289	Main River	EA
	Thorney Mill (u/s)	ST 4280 2260	Main River	EA
River Isle	Midelney Pumping Station (u/s) and (d/s)	ST 4171 2352	Main River	EA
	Midelney Lock (u/s)	ST 4161 2347	Main River	EA
	Midelney Bridge (d/s)	ST 4078 2309	Main River	EA
	Hambridge (d/s)	ST 3973 2209	Main River	Private
West Moor Main Drain	Midelney Pumping Station (u/s) and (d/s)	ST 4171 2352	Main River	EA
	Westmoor Main Drain Gravity Outfall (u/s)	ST 4171 2357	Main River	EA
	Middle Bridge (d/s)	ST 4037 2117	Main River	EA
	Midelney Tunnel (u/s)	ST 4169 2358	Main River	EA
South Moor Main Drain	South Moor Main Drain Gauge Board (d/s)	ST 4092 2316	Main River	EA
In the RWLAs	Structure A – Inlet (u/s)	ST 4089 2209		IDB
	D (Penstock, flap valve and syphon) (u/s) and (d/s)	ST 4207 2265		IDB
	Westmoor Catchwater Penning Boards (S1) (u/s)	ST 4107 2212		EA
	Westmoor Catchwater Penning Boards (S2) (u/s)	ST 4120 2218		EA
	Yonder Drove Rhyne penning boards (S3) (u/s)	ST 4193 2239		EA
	Yonder Drove Rhyne Penning Boards (S4) (u/s)	ST 4209 2247		EA
	Westmoor Main Drain Penning Boards (S6) (u/s)	ST 4184 2323		EA
	S7	ST 4235 2223		IDB
	S8	ST 4199 2162		IDB
	S9	ST 4157 2218		IDB
	S10	ST 4191 2153		IDB

3.7.5. Water level telemetry

The Environment Agency has installed telemetry where there is an operational need to be kept informed of water levels and to alert staff to changes in water levels. The Environment Agency has telemetry installed at Midelney Pumping Station, Thorney Mill and Oath Lock, which remotely monitors water levels in the Main Drain, River Parrett and River Isle. The pumping station has prescribed target water level ranges for summer and winter, and a series of alarms alert staff when water levels go outside of the predetermined range. Alarms have also been created for weed screens, pump failure, mains failure and telemetry failure. Alarms are received 24 hours a day, seven days a week by a 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 three abstraction licences that may affect water management on the Plan area, which are summarised in Table 6.

Table 6: Abstraction licences in or near West Moor

Licence no	Description	Point name	Max daily vol. (m^3)	Max annual vol. (m^3)
16/52/002/S/286	Spray Irrigation - Direct	Westmoor Main Drain (ST 4099 2101)	310	30000
16/52/003/S/217*	Spray Irrigation - Direct	Inland Water known as River Parrett (ST 4367 2140)	128	18000
16/52/003/S/213†	Hydroelectric Power Generation	Thorney Mills (ST 4287 2261)	112300	27500000

* Condition on 16/52/002/s/217 - Gauge post in River Parrett at ST 4369 2138. Abstraction may only take place when the level is equal to or greater than 9.7m ODN

† Condition on 16/52/003/S/213 - Cessation condition of 50 l/s on R Parrett. Flow to be maintained over the sluice.

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.

There are a number of discharge consents in and around the West Moor Plan area as shown in Table 7.

Table 7: Discharge consents in or near West Moor.

Consent no	Site name	Grid reference	Discharge type
101136	Barns at Midelney Manor	ST 4099 2289	Domestic property (multiple)
102770	Midelney Pumping Station	ST 4077 2310	Unidentified
071776	Hambridge Pumping Station	ST 3997 2211	Sewerage network – storm overflow & emergency overflow
071401	White Cross	ST 4074 2405	Domestic property (single)
103457	May Farm	ST 4081 2035	Domestic property (multiple)
100700	Lower Burrow Farmhouse	ST 4188 2059	Domestic property (single)
013464	Kingsbury Episcopi Pumping Station	ST 4305 2115	Sewerage network – storm overflow & emergency overflow
102327	Turnpike House	ST 4351 2126	Domestic property (single)
013034	Little Orchard	ST 4340 2149	Domestic property (single)
012806	Coombe Villa	ST 4332 2170	Domestic property (multiple)
101274	Riverside Farm	ST 4279 2262	Domestic property (single)
101613	Thorney Cottages	ST 4278 2269	Domestic property (multiple)
100658	Sunny Banks	ST 4270 2272	Domestic property (single)

4. Agriculture and other land uses

4.1. Agriculture

Agriculture is the predominant, most extensive 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, semi-improved and unimproved grassland used for grazing and for winter fodder covering about 80% of the farmed area. Livestock farming systems not only produce food but the wider land management they provide is crucial in delivering conservation outcomes, for example through agri-environment agreements. Farm businesses need continual re-investment to survive if their food production and conservation land management are to continue.

The growing need for food security, and the growing demand for quality food to supply the increasing population of the UK and elsewhere, may stimulate additional investment in agriculture on some farms in the area in the coming years. The larger farm units in particular have invested in productive capacity over the years and will continue to do so in line with market signals. Many will also continue to deliver environmental outcomes alongside food production. Within the West Moor SSSI, appropriate balances will be sought between agriculture, nature conservation value, flood risk and the vulnerability of peat soils.

4.2. Built development, services and transport

A number of domestic and commercial properties in the Plan area depend, either directly or indirectly, on the effective flood protection and water level management. Low lying properties, utilities infrastructure and minor roads (which provide essential transport links) would suffer from flooding or waterlogging without the appropriate maintenance of flood defences, Main Rivers and IDB Viewed Rhynes.

The provision of adequate land for housing and employment is a national priority and Local Planning Authorities are charged with ensuring that sufficient land is made available though the new Local Development Frameworks. However, new development in areas of high flood risk may not be sustainable, particularly where these low lying areas are protecting existing development by providing space for water.

The Local Authorities consult 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 duty to consider recreation on or near water and aims to create a quality of environment that people will be able to enjoy. The Agency's vision is to conserve and improve the quality of the river environment whilst balancing recreational interests on water (e.g. canoeists, rowers, anglers and boaters) and on river banks (e.g. cyclists, horse-riders, walkers and bird watchers).

The River Parrett Trail is a nationally recognised walk which draws tourists to the area. The number of people using the trail is expected to grow as demand for recreation increases each year.

4.4. Fisheries

The Environment Agency has a duty to maintain freshwater and eel fisheries. These fisheries are a major part of the wildlife interest and ecology of the Plan area; especially eels, which are widely distributed and are a favoured food for both otters and fish-eating birds. Works to improve water level management will have to consider fisheries improvements, and any new structures should allow for the free movement of eels and elvers. The Environment Agency's fisheries officers can provide advice to ensure that fisheries are safeguarded and that the Environment Agency's duty to fisheries is not prejudiced.

Some of the watercourses in the catchment area are de-silted 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 de-silting must be carefully considered to avoid these impacts. In some watercourses, excessive build up of duckweed at penned structures can be a problem during the summer that can result in de-oxygenation. Removal of the duckweed is difficult, although the use of floating booms across the watercourse can help to prevent the duckweed from completely covering the water surface.

Regular angling takes place on the Parrett and the Isle, as well as many of the large rhynes. The watercourses in this area are important coarse fisheries with roach, bream, pike, tench, ruffe and eels as the dominant species. Rudd, gudgeon, perch and carp are also locally important.

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 and yellow wagtail.

b) Part of a large wetland of international importance for its overwintering and migratory populations of waterfowl, and in particular golden plover, teal, wigeon, shoveler 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, lapwing, snipe, ducks and rails / crakes.

The Plan area includes:

a) West Moor SSSI (213 hectares / 526 acres) notified in 1985;

a) West 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;

b) West Moor SSSI is part of the Somerset Levels and Moors Ramsar Wetland of International Importance, which was designated under the terms of the Ramsar Convention in June 1997;

c) Part of the Westport Canal County Wildlife Site.

The locations of the nature conservation sites are shown on Map 5 and Natural England's advice to the Parrett IDB on the water management requirements for West Moor SSSI is summarised on Map 7.

Box 1: 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.

5.2. Biodiversity Action Plans

The floodplain grazing marshes found within the West Moor area are considered a habitat of primary importance in the UK Biodiversity Action Plan (1996). Furthermore, the 25km of Main Rivers and Viewed Rhynes in the Plan area, and the associated network of ditches and ponds, are biodiversity rich habitats that support good populations of priority BAP species such as water voles and otters.

The IDBs in Somerset have recently completed a biodiversity audit of all BAP species and habitats in their drainage districts and used this information to prepare a Biodiversity Action Plan relevant to IDB activities and interests (April 2010). The introduction of an IDB BAP for Somerset is intended to assist the integration of biodiversity conservation and enhancement works into IDB planning and work programmes. The new IDB BAP will also allow the Somerset IDBs to demonstrate and record their important contributions to conserving biodiversity. The Somerset IDB BAP sets objectives and targets for the conservation and enhancement of wetland species and habitats, and provides a link to the national and local BAP targets. The IDB BAP will also be used to report progress on the implementation of all IDB WLMPs in Somerset.

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.

Financial support for the conservation management of land is available to farmers and landowners from Natural England, who administers the Environmental Stewardship scheme on behalf of DEFRA. Such agri-environment schemes operate on the principle that the landowner, or farmer, voluntarily enters into an agreement where payment is made in return for following land management practices that benefit the environment. Farmers can join Entry Level Stewardship (ELS), where a basic payment is made for 5 years for basic environmental management, or Higher Level Stewardship (HLS), which is more targeted and provides higher payments for more demanding conservation management over 10 year agreements. Many farmers in the area have still to complete their agreements under the previous Somerset Levels and Moors Environmentally Sensitive Area (ESA) Scheme.

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 artefacts.

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.

All the known archaeology in the area is contained in the County Sites and Monuments Record which is kept in map form and on computer at County Hall, Taunton. This represents information collected from aerial photographs, excavations, chance finds, observations of drainage ditches and other sources. However in the Somerset Levels and Moors the deep deposits of clay and peat that have built up over thousands of years mean that much of the local archaeology in the area remains hidden from the normal forms of archaeological detection. Therefore the known archaeology recorded on the Sites and Monuments Record represents only a fraction of the total archaeological resource that lies below the surface.

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 site, the applicant is obliged to consult Natural England. Where works may affect a European designated site, the Environment Agency will undertake a test of likely significance and seek Natural England's approval before a consent can be issued. These conditions will also apply to proposals that lie outside the boundary of a designated sites but which may impact on the site.

6.2. Works adjacent to IDB rhynes

Under the Land Drainage Act (1991), the Parrett IDB 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 IDB's Byelaws. The Parrett IDB exercises this administrative control using a series of policy documents adopted by the IDB 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 a SSSI, the IDB consults Natural England before arriving at its decision. The form

of consent given by the IDB states that such consent does not override the necessity of obtaining other statutory consents (including that of Natural England).

6.3. Private ownership of land and property rights

Most of the land within the Plan area is under private ownership and is occupied either by the owner or by tenants, licensees, graziers etc. For the WLMP to be sustainable and succeed, any works or proposals to vary water levels must respect all legal obligations and responsibilities including property rights. As mentioned in 4.1, the predominant land use across the Plan area is agriculture, and changes in water levels can potentially have a significant impact on agricultural activities carried out by owners and/or occupiers. Changing of water levels to achieve conservation objectives (e.g. within SSSI areas) will be achieved most sustainably through negotiation of individual agri-environment agreements under the HLS scheme, whereby farmers receive an appropriate payment in return for their management which delivers the public benefit (in terms of favourable SSSI condition).

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.

Seasonal changes in water levels are normally implemented on the 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'. 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. Under these circumstances, the IDB will consult Natural England before advancing or delaying the normal operating dates by more than two weeks.

7.1.1. Contingency measures for drought

During a drought situation the Environment Agency will encourage the public and industry to practice water efficiency and to conserve water, whilst all abstraction licence holders will be encouraged to minimise water abstraction. There will also be close liaison between the Environment Agency and the Parrett IDB to conserve water and to ensure a fair distribution of what water is available.

If there is an exceptional shortage of rain, or a serious deficiency in water flow that threatens flora or fauna, drought permits or orders may be issued. Drought permits are issued by the Environment Agency to enable water 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.

7.1.2. Current target water levels

The current target water levels for key control structures within the Plan area are set out in Table 8. The Parrett IDB will consult Natural England and the Environment Agency if they are considering changing the water levels at a structure so that it falls outside the range given in the

Plan. Target water levels have been adjusted for gauge board errors and relate to metres above Ordnance Datum Newlyn (ODN).

Table 8: Current target water levels in West Moor

Water level control structure	Grid Ref.	Operated by	Summer level (m ODN)	Winter level (m ODN)	Flood operation
Oath Lock Sluice	ST 3831 2787	EA	6.60	5.50	Gates open
Thorney Mill	ST 4287 2262	EA	10.30	9.30	Sluice open
Midelney Lock / Sluice	ST 4164 2348	EA	Closed (1.3m max pen)	Closed (1.3m max pen)	Left channel open
Slabgate Weir	ST 3999 2214	EA	7.40 (fixed crest)	7.40	7.40 (fixed crest)
Middlemoor Bridge Flap	ST 4049 2234	Not operated	Not operated	Not operated	Not operated
Midelney Tunnel (Sluice)	ST 4169 2358	EA	Open (Not operated)	Open (Not operated)	Open (Not operated)
South Moor Sluice	ST 4162 2366	EA	6.77	Not penned	No operation required
Midelney (West Moor) Pumping Station	ST 4171 2352	EA	6.10	5.85	Operates

Notes: **Summer season:** Aim to achieve summer pen levels in the Main Drain from 1 April.
Winter season: Aim to achieve winter pen levels in the Main Drain by 1 December.
ODN: Ordnance Datum Newlyn.

7.1.3. Raised Water Level Areas

There are two Raised Water Level Areas (RWLA) schemes in the Plan area, where high water levels are maintained in winter and spring to provide suitable wetland conditions for wildfowl and waders (see Box 2 for target conditions). The original West Moor RWLA was constructed in 1993 and is currently maintained by the Environment Agency. An extension to this area was constructed by the Parrett IDB in 2007. Details of these areas are set out in Tables 9 and 10, and their locations are shown on Map 4.

Table 9: Raised Water Level Areas in West Moor

Raised Water Area	Maintained & operated by	Area in hectares	Area in acres
Original blocks	EA	77	190.3
Extension	IDB	63	155.7

Table 10: Current target water levels for RWLAs in West Moor

Water level control structure	Grid Ref.	Operated by	Summer level (m ODN)	Winter level (m ODN)
Inlet Penstock A	ST 4088 2212	IDB	Open	Open
Shuttle Wall Inlet (Structure B)	ST 4164 2339	IDB	Redundant	Redundant
Inlet Penstock C	ST 4148 2244	IDB	Open	Open
D (Penstock, flap valve and syphon)	ST 4207 2265	IDB	Flap open Penstock closed	Flap open Penstock closed
Flap Valve E	ST 4073 2209	IDB	Open	Open
Flap valve E6	ST 4208 2280	EA	6.33 (open)	6.63 (closed)
Westmoor Catchwater Penning Boards (S1)	ST 4107 2212	EA	6.96	7.26
Westmoor Catchwater Penning Boards (S2)	ST 4120 2218	EA	6.80	7.10
Yonder Drove Rhyne penning boards (S3)	ST 4193 2239	EA	6.33	6.63
Yonder Drove Rhyne Penning Boards (S4)	ST 4209 2247	EA	6.19	6.49
Old Westmoor Catchwater Penning Boards (S5)	ST 4175 2315	EA	Redundant	Redundant
Westmoor Main Drain Penning Boards (S6)	ST 4184 2323	EA	6.33	6.63
S7	ST 4235 2223	IDB	Open	6.63
S8	ST 4199 2162	IDB	Open	6.44
S9	ST 4157 2218	IDB	Open	6.63
S10	ST 4191 2153	IDB	Open	6.55

7.2. Current flood management regime

The Environment Agency has permissive powers to carry out works to reduce flood risk on Main Rivers. The primary flood defences within this Plan area are raised earth embankments located on either side of the River Parrett, with a few small sections of harder engineering (e.g. steel piles and 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 and maintenance works are carried out when necessary.

The Environment Agency regularly inspects and operates the main inlet structures into the Plan area. These are closed when water levels in the River Parrett rise in order to minimise risk of flooding from the river. During flood conditions, the Midelney Pumping Station is operated by the Environment Agency to drain the moor until high river levels make pumping ineffective. At this point, the pumps are manually switched off and operatives monitor the situation until they can resume pumping.

7.2.1. Contingency measures for flooding

The Environment Agency carries out active monitoring of raised flood banks during high flows, and ensures 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 IDB are investigating the potential benefits of pre-emptive lowering of water levels at key control structures in anticipation of extreme weather conditions. 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, especially in summer. This work is at an early stage and will need to consider the impacts on the SSSI and the concern that it may be difficult to restore summer pen levels if forecast rainfall does not occur.

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.

Box 3: 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 rated as high, medium or low risk. As a result, maintenance is targeted towards high risk systems. The Environment Agency regularly reviews its annual and intermittent maintenance procedures, in accordance with national guidance and policy, to ensure that a high level of flexibility and efficiency of funding and staffing allocation are achieved.

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 Environment Agency does not typically use herbicides in the Plan area.

The left and right banks of the River Parrett are flailed annually where no regular grazing takes place. This is done to control weed growth and to reduce the risk of burrowing mammals (e.g. rabbits and badgers) destabilising the banks.

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 that works are completed as requested. Where the Environment Agency owns land, it will carry out any required tree maintenance.

7.3.2. Parrett IDB maintenance practices

The Parrett IDB maintains all Viewed Rhynes in the West Moor area once a year in late summer or during the winter. 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, 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 in the Plan area helps to secure, or makes significant progress towards achieving, this SSSI 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, utility infrastructure or rights of way.

Objective 8 – Watercourse maintenance operations
Maintain the watercourses in the Plan area on rotation and in a sympathetic manner, 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 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
Mitigate the impacts of flooding where these are damaging to the biodiversity and agricultural interests of the Plan area.

Objective 11 – Drought management
Mitigate the impacts of drought where these are 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 and by the Environment Agency 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 the Plan area, as set out in Tables 8 and 10 will continue to be maintained by the Drainage Board.

Reason: The current target water levels in watercourses throughout the Plan area, including West Moor SSSI, appear to be favourable to the farming and wider biodiversity interests of the area.

Proposal 2: Maintenance of the current Viewed Rhyne network will continue to be undertaken by the Drainage Board.

Reason: The Parrett IDB will continue to maintain the existing Viewed Rhyne network, as shown on Map 2, and is of the opinion that its current maintenance procedures help to achieve favourable condition and to further conservation and biodiversity in the West Moor SSSI.

The Parrett IDB will keep these maintenance procedures under review but does not propose to change any of these procedures other than those subject to the review described above.

9.2. Proposed changes to water control infrastructure

Proposal 3: The Parrett IDB will develop a capital improvement scheme to maintain favourable condition for West Moor SSSI and improve water level management in the Plan area.

Reason: The Parrett IDB acknowledges that the effective and sustainable management of water levels is crucial to maintaining the condition of West Moor SSSI. The Parrett IDB will therefore develop a long-term improvements programme for water management on West Moor, in order to maintain the SSSI in favourable or recovering condition.

9.3. Proposed changes to target water levels

No changes to water levels are proposed in this Water Level Management Plan.

The Parrett IDB acknowledges that there may be potential to increase the area managed with raised water levels in the winter and/or the spring months within the Plan area. The Parrett IDB would support Natural England in their work to secure the appropriate agri-environment agreements to increase the area managed for breeding waders in the spring over the five years of this WLMP. The improvements to the water management infrastructure in this Plan would support, and not prejudice, the realisation of these opportunities in future years.

9.4. Proposed changes to operational procedures and responsibilities

Proposal 4: The Parrett IDB and the Environment Agency will adopt a flexible operating regime that allows variations in water levels and seasonal penning dates in response to weather conditions.

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 need to be responsive to the prevailing weather conditions at the time.

The Parrett IDB and the Environment Agency propose to adopt the following principles for establishing operating guidelines for key water management structures:

- The timing of the normal seasonal changes in pen level can vary by up to two weeks from the date specified in the Plan;
- The normal water level can range up to 50 mm above the level specified in the Plan during dry conditions;
- The normal water level can range up to 100 mm below the level specified in the Plan during wet conditions.

The Environment Agency and the Parrett IDB have also agreed to meet three weeks before the normal changeover date to confirm summer/winter penning dates based on catchment conditions. If the catchment conditions require the Parrett IDB or the Environment Agency to operate outside these guidelines then consultation with Natural England will take place.

Proposal 5: 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 to having one Operating Authority manage 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 maintenance and operational responsibility for some of the control structures currently maintained and operated by the Environment Agency.

DEFRA and Government priorities, with regards to flood risk management, have been evolving over the past few years. This has resulted in the Environment Agency having to review its priorities and activities. The Environment Agency currently maintains and operates many structures that provide essential land drainage and nature conservation benefits. It also manages and maintains Main Rivers that serve no critical flood defence benefit. In the future the Environment Agency may no longer be able to justify maintaining or operating these structures and watercourses. The Environment Agency may consider de-maining some watercourses on this basis in the future.

One possible option is for the Parrett IDB to take over the ownership and management of these watercourses and structures, to continue a system of professional management and to provide continuity for the benefit of land owners and wildlife. The structures identified for this proposal are listed in Table 11.

Table 11: Proposed changes in ownership and responsibility of water control structures

Structure	Current operator	Proposed operator
Inlet Penstock A	EA	IDB
Flap valve E6	EA	IDB
Westmoor Catchwater Penning Boards (S1)	EA	IDB
Westmoor Catchwater Penning Boards (S2)	EA	IDB
Yonder Drove Rhyne penning boards (S3)	EA	IDB
Yonder Drove Rhyne Penning Boards (S4)	EA	IDB
Old Westmoor Catchwater Penning Boards (S5)	EA	IDB
Westmoor Main Drain Penning Boards (S6)	EA	IDB

Proposal 6: The Parrett IDB, the Environment Agency and Natural England will establish and maintain a monitoring programme to support the implementation of the Plan and to ensure that water level management meets the agreed objectives.

Reason: Changes in water levels and operational practices will be monitored by the relevant authorities and assessed to determine their effects on conservation, agriculture and flood risk management. The Parrett IDB will report on the outcomes of this monitoring, at least once a year, for three years following the implementation of the Plan.

Several organisations are involved in monitoring environmental information that is relevant to the WLMP, as set out in Table 12.

Table 12: Monitoring arrangements for West Moor

Lead body	Topic of monitoring
Parrett IDB	• Target water levels at key IDB control structures; • Maintenance of Viewed Rhynes; • Monitoring channel profiles and conveyance in Viewed Rhynes; • Maintenance of minor watercourses, farmers ditches etc; • Water quality.
Environment Agency	• Target water levels at key Agency control structures; • Maintenance of Main Rivers; • Monitoring channel profiles and conveyance in Main Rivers; • Catchment rainfall and weather events; • Water quality.
Natural England	• Plant, bird, invertebrate and mammal communities; • Land management; • Surface water and soil wetness conditions. • Water quality.

It is anticipated that an ongoing monitoring programme of long-term changes in the plant, bird, invertebrate and mammal communities of West Moor will be undertaken by Natural England and others. The data collected will be 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.

9.5. Proposed changes to maintenance practices

Proposal 7: The Environment Agency will complete its review of the maintenance of Main Rivers within and adjacent to the Plan area.

Reasons: The Environment Agency is currently investigating the effectiveness of silt removal from a number of Main Rivers and Drains in the Parrett IDB District including, the Rivers Parrett and Tone, North Moor Main Drain and West Sedgemoor Main Drain. The Environment Agency will use the findings of these investigations to help determine the need for a programme of de-silting.

10. Unresolved matters

10.1. Climate change impacts

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.

The Government has recently introduced the Carbon Reduction Commitment, which the Environment Agency and other public sector organisations must comply with. The Environment Agency has set itself a target of 33% carbon reduction by 2015. Therefore, water level management needs to be carried out with the minimum of CO_2 output. The Parrett IDB will work with the Environment Agency to identify opportunities, such as maximising gravity discharge, and investigate the potential impacts of such measures on flood risk management and the environment.

11. 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 13.

Table 13: Amendments agreed during the period of the Plan

No.	Date	Amendment	Agreed

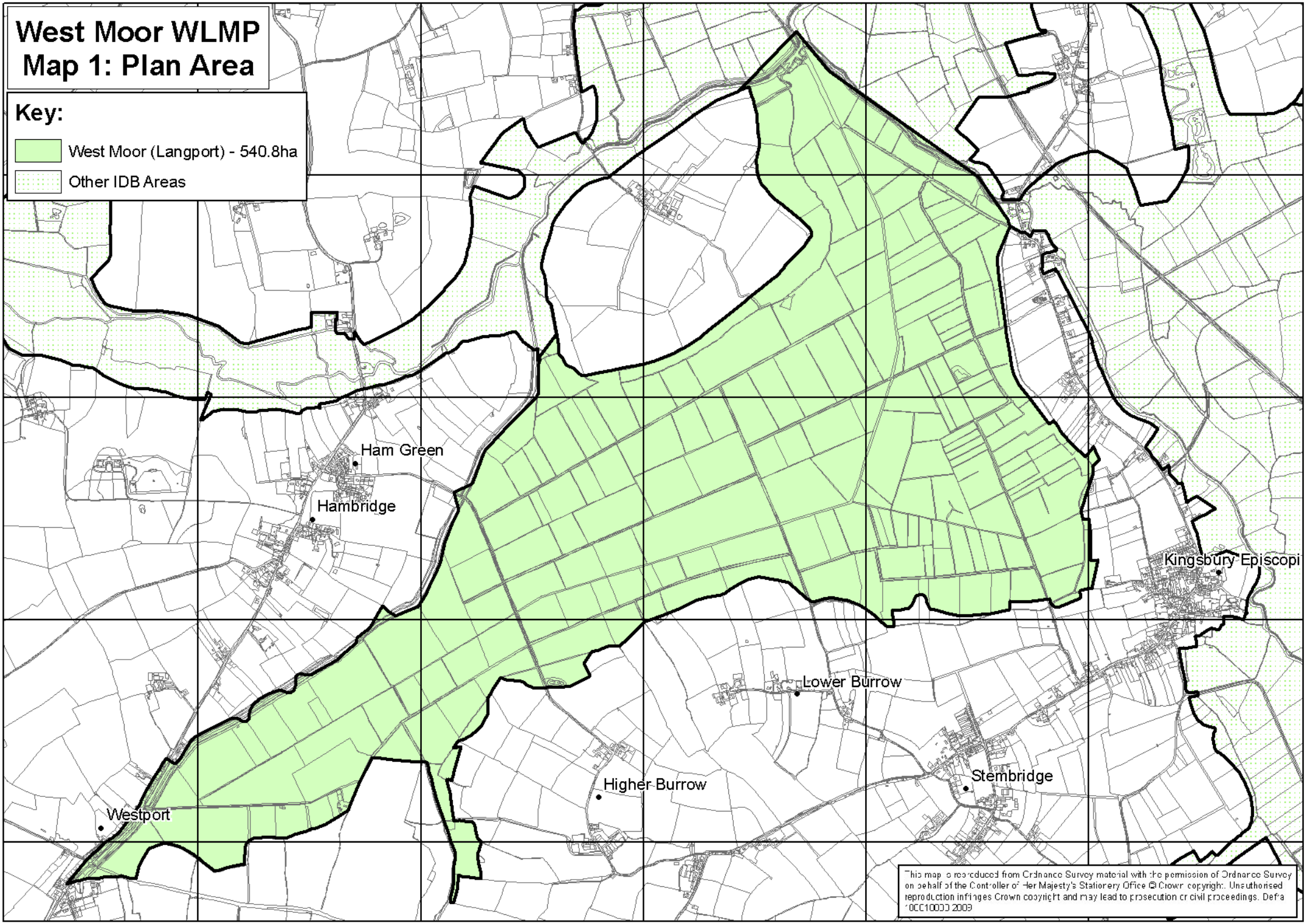
12. Review arrangements

The Parrett IDB proposes to review this WLMP in 2015, five years after it has been adopted. If any alterations to operating procedures or maintenance are required before 2015, these will be discussed by the IDB, the Environment Agency and Natural England and can agreed as interim measures pending the full review.

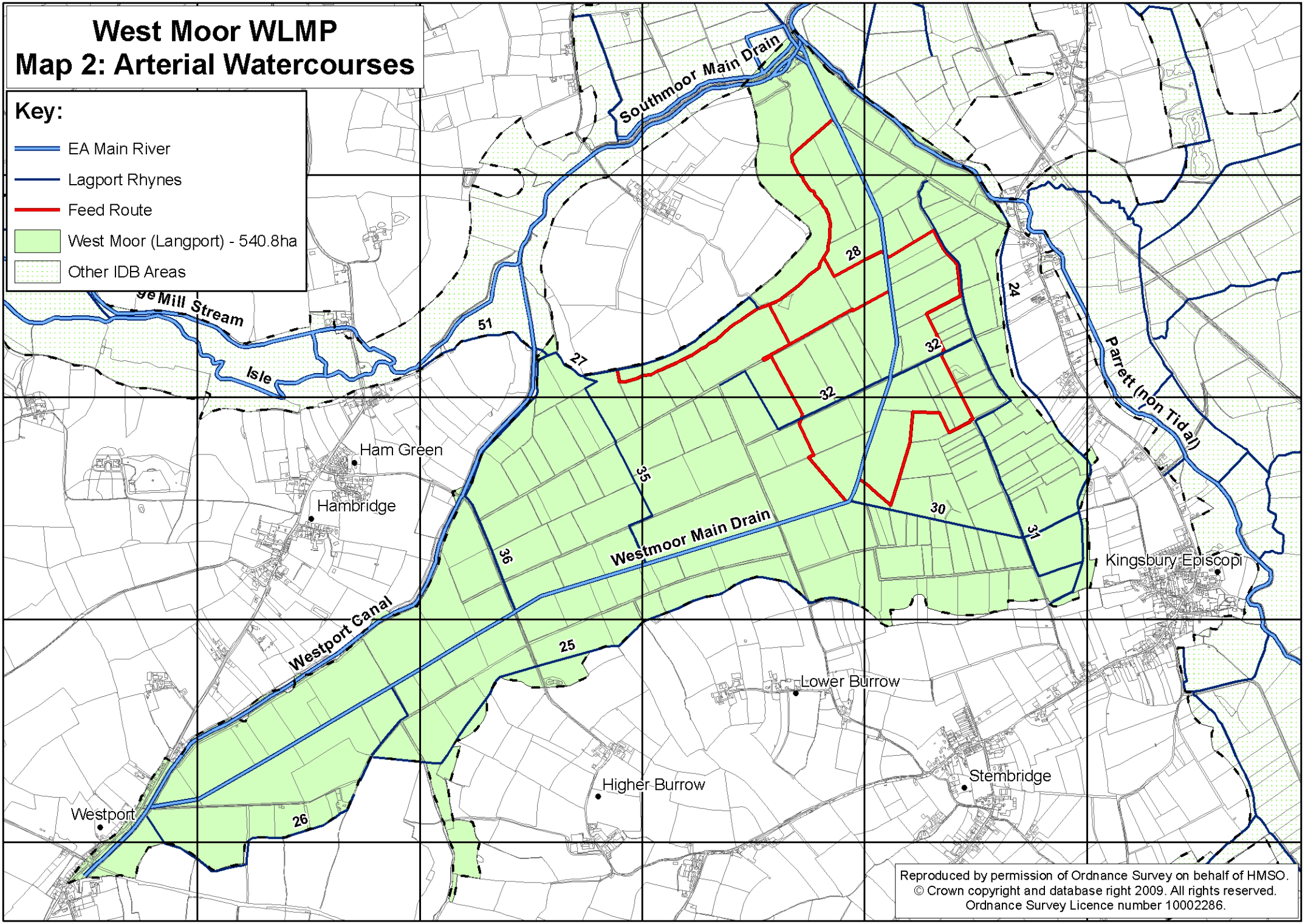
13. Timetable of actions: West Moor 2010 WLMP

	Proposed continuation of current good practice	
1:	The current summer and winter penning levels in the watercourses of the Plan area, as set out in Tables 8 and 10 will continue to be maintained by the Drainage Board.	**Ongoing**
2:	Maintenance of the current Viewed Rhyne network will continue to be undertaken by the Drainage Board.	**Ongoing**
	Proposed changes to water control infrastructure	
3:	The Parrett IDB will develop a capital improvement scheme to maintain favourable condition for West Moor SSSI and improve water level management in the Plan area.	**Works identified by end 2012**
	Proposed changes to target water levels	
	There are no changes to water levels proposed in this Water Level Management Plan.	-
	Proposed changes to operational procedures and responsibilities	
4:	The Parrett IDB and the Environment Agency will adopt a flexible operating regime that allows variations in water levels and seasonal penning dates in response to weather conditions.	**Immediate**
5:	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.	**Complete by end 2013**
6:	The Parrett IDB, the Environment Agency and Natural England will establish and maintain a monitoring programme to support the implementation of the Plan and to ensure that water level management meets the agreed objectives.	**Establish winter 2010**
	Proposed changes to maintenance practices	
7:	The Environment Agency will complete its review of the maintenance of Main Rivers within and adjacent to the Plan area.	**Complete by end 2011**

West Moor WLMP
Map 1: Plan Area

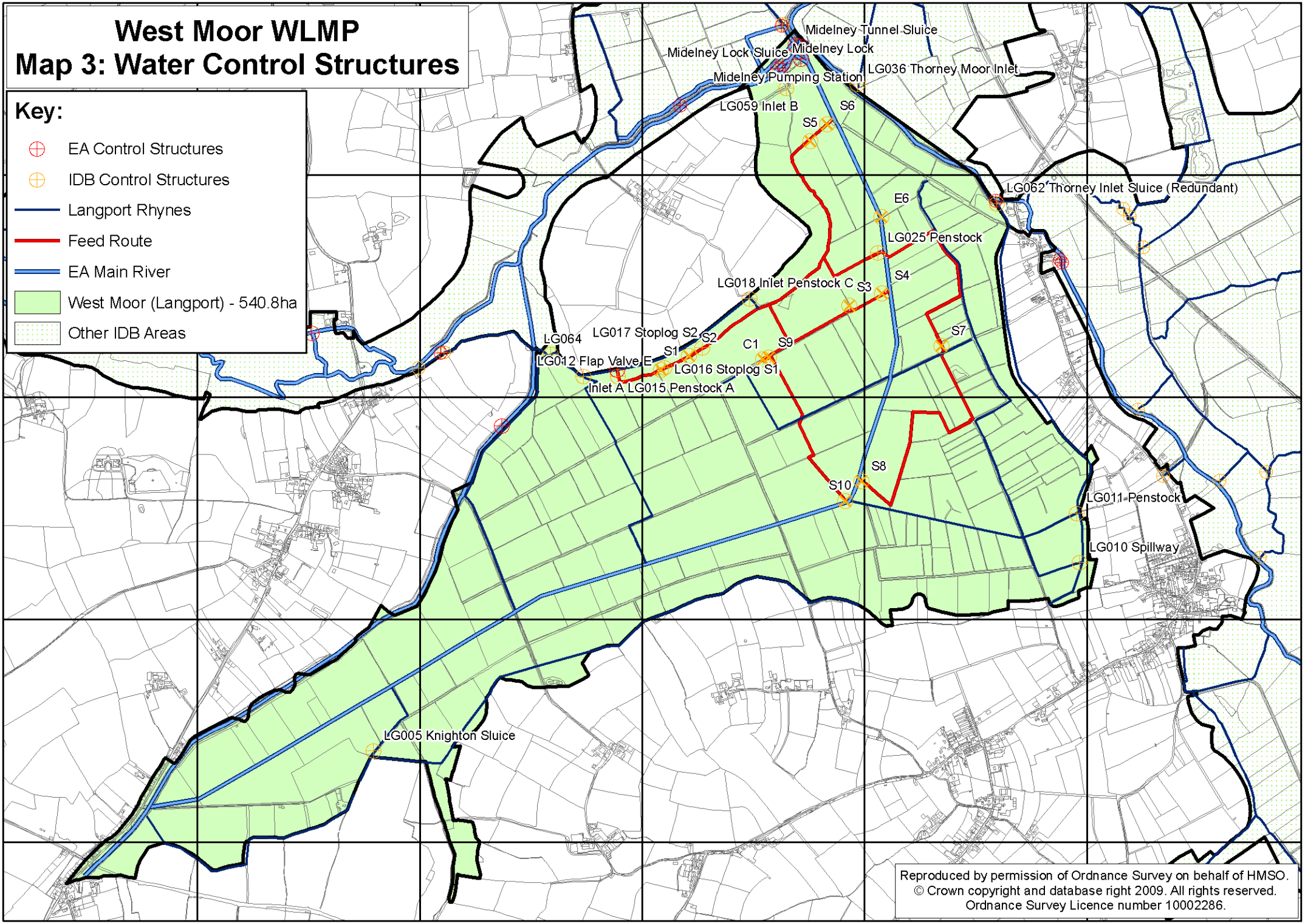


West Moor WLMP
Map 2: Arterial Watercourses



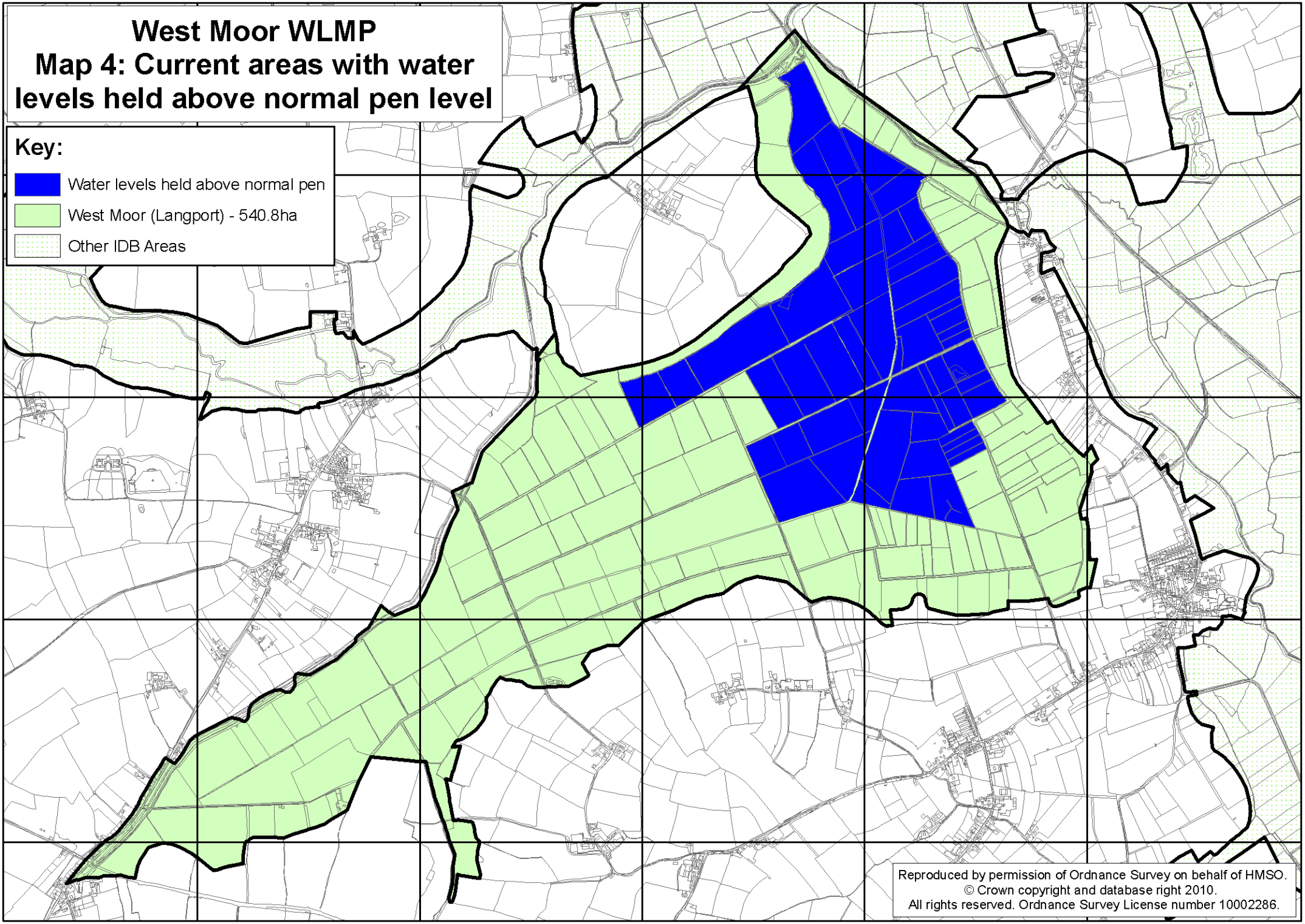
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West Moor WLMP
Map 3: Water Control Structures



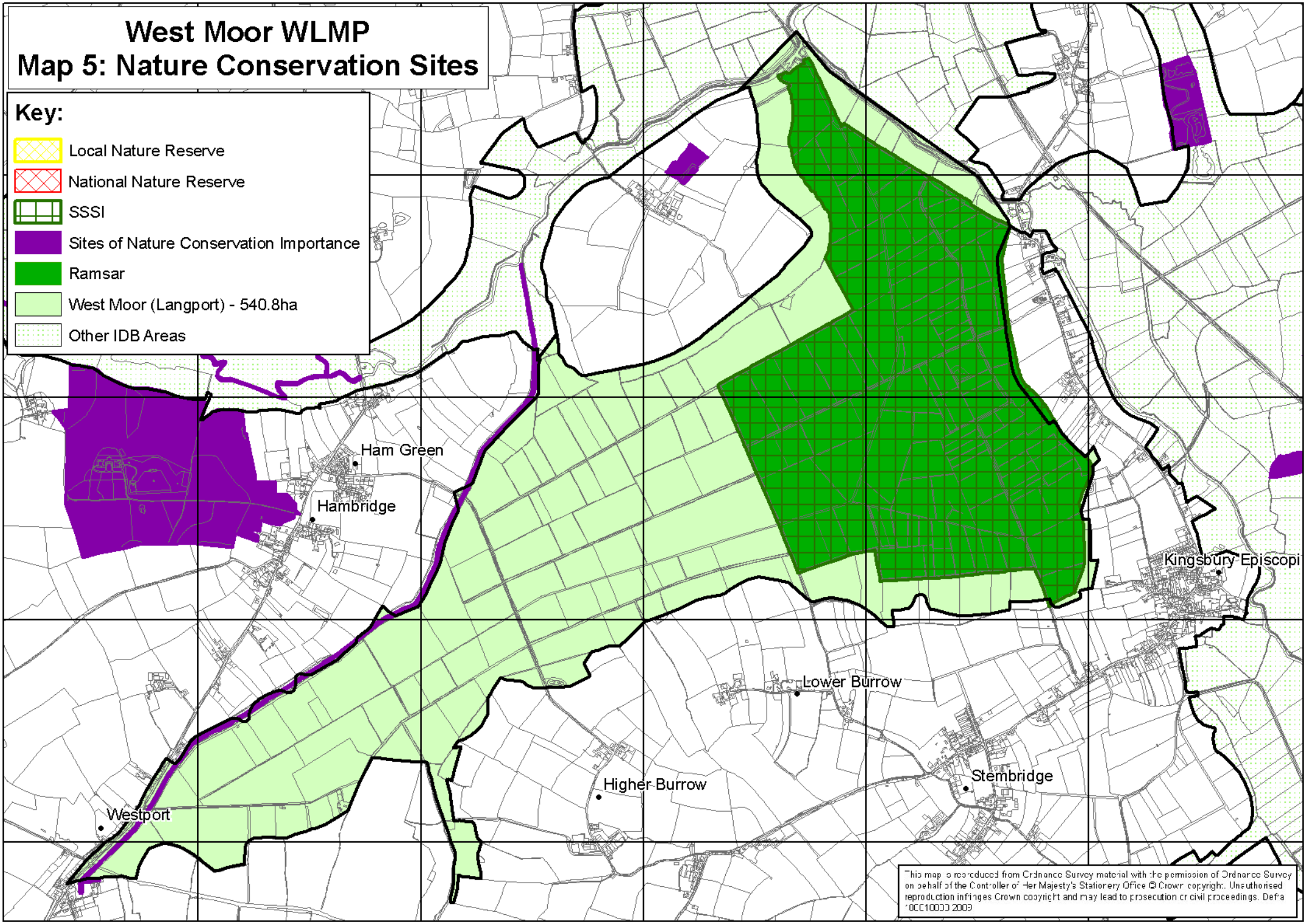
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West Moor WLMP
Map 4: Current areas with water levels held above normal pen level

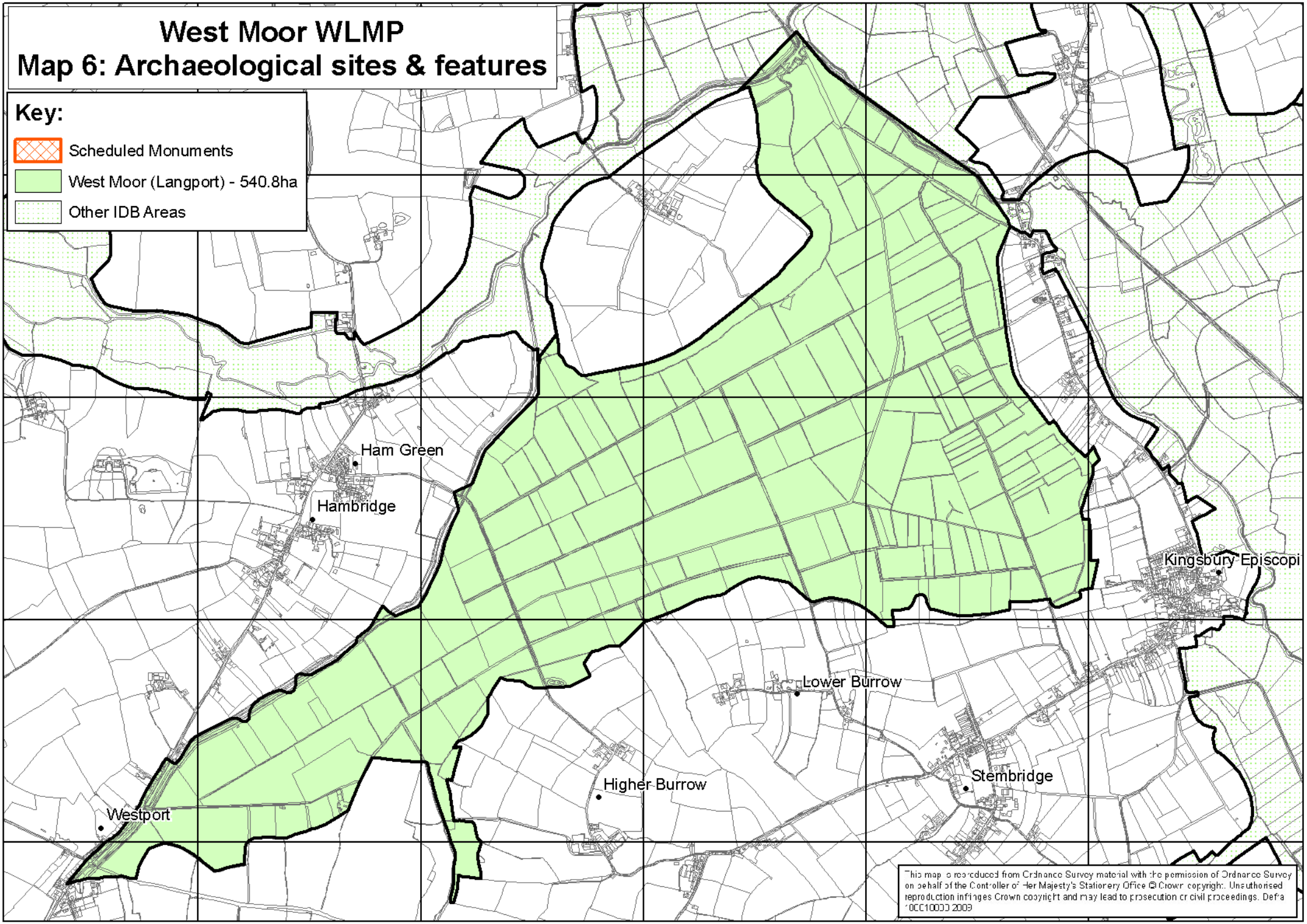


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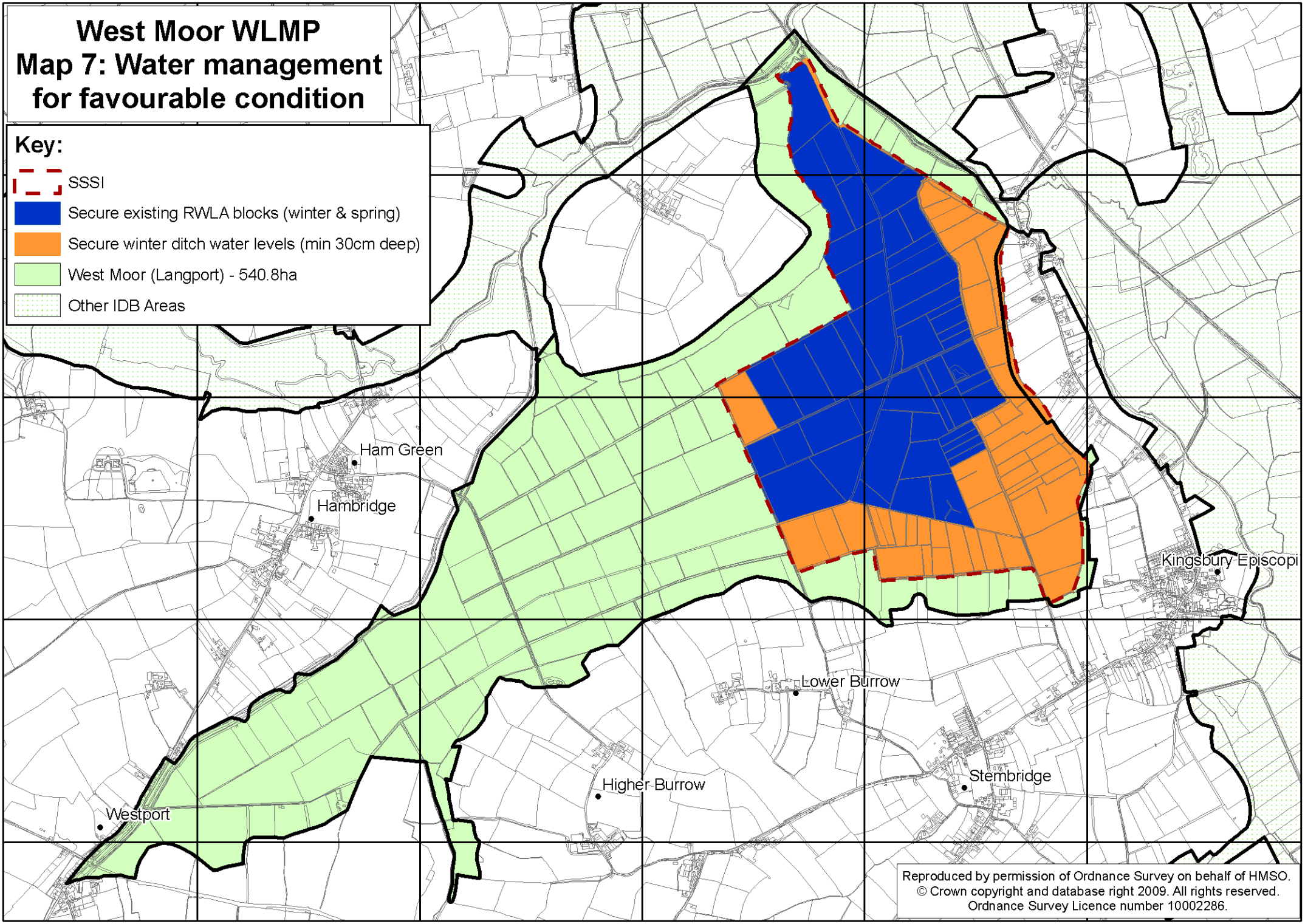
West Moor WLMP
Map 5: Nature Conservation Sites



West Moor WLMP
Map 6: Archaeological sites & features

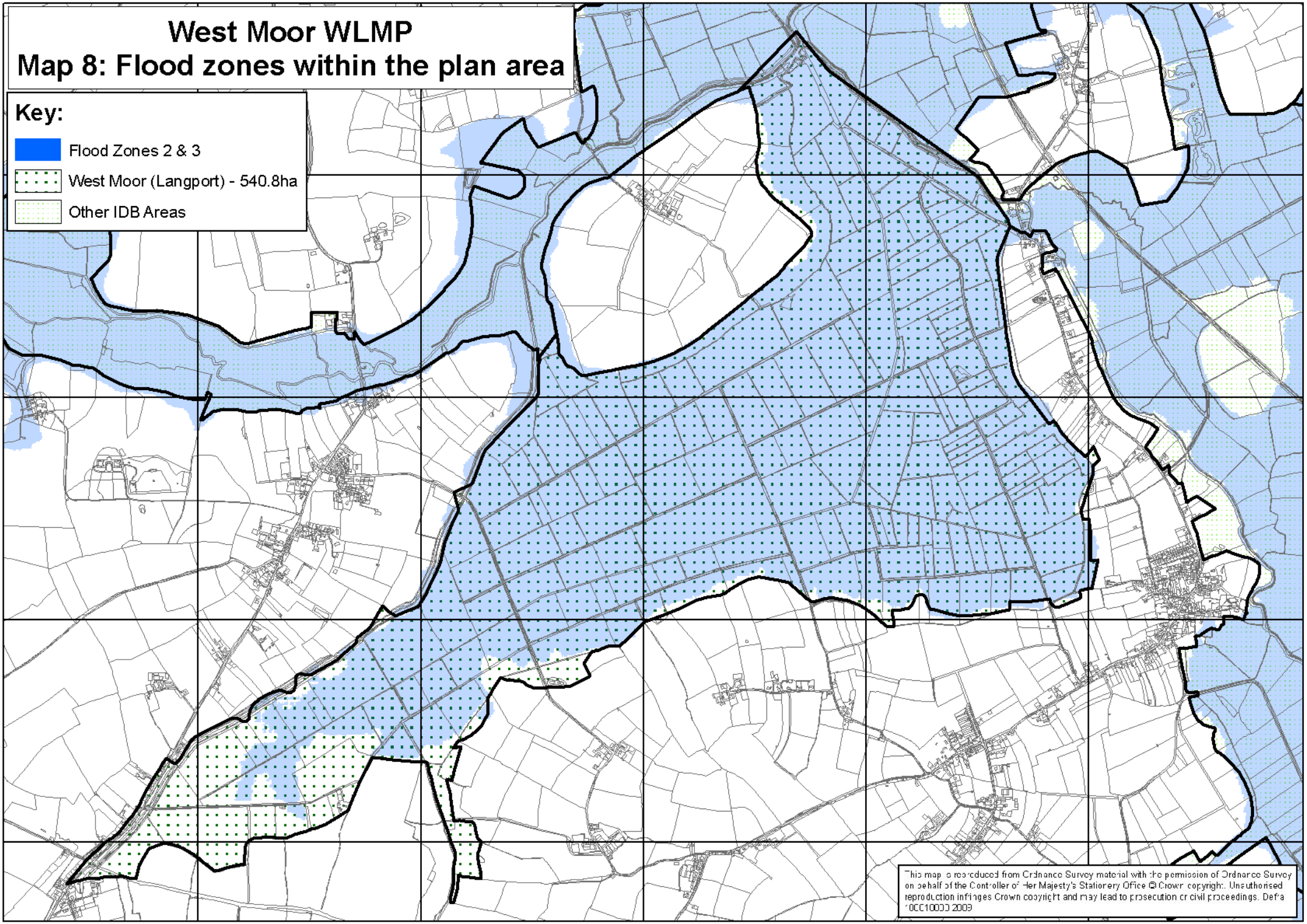


West Moor WLMP
Map 7: Water management for favourable condition



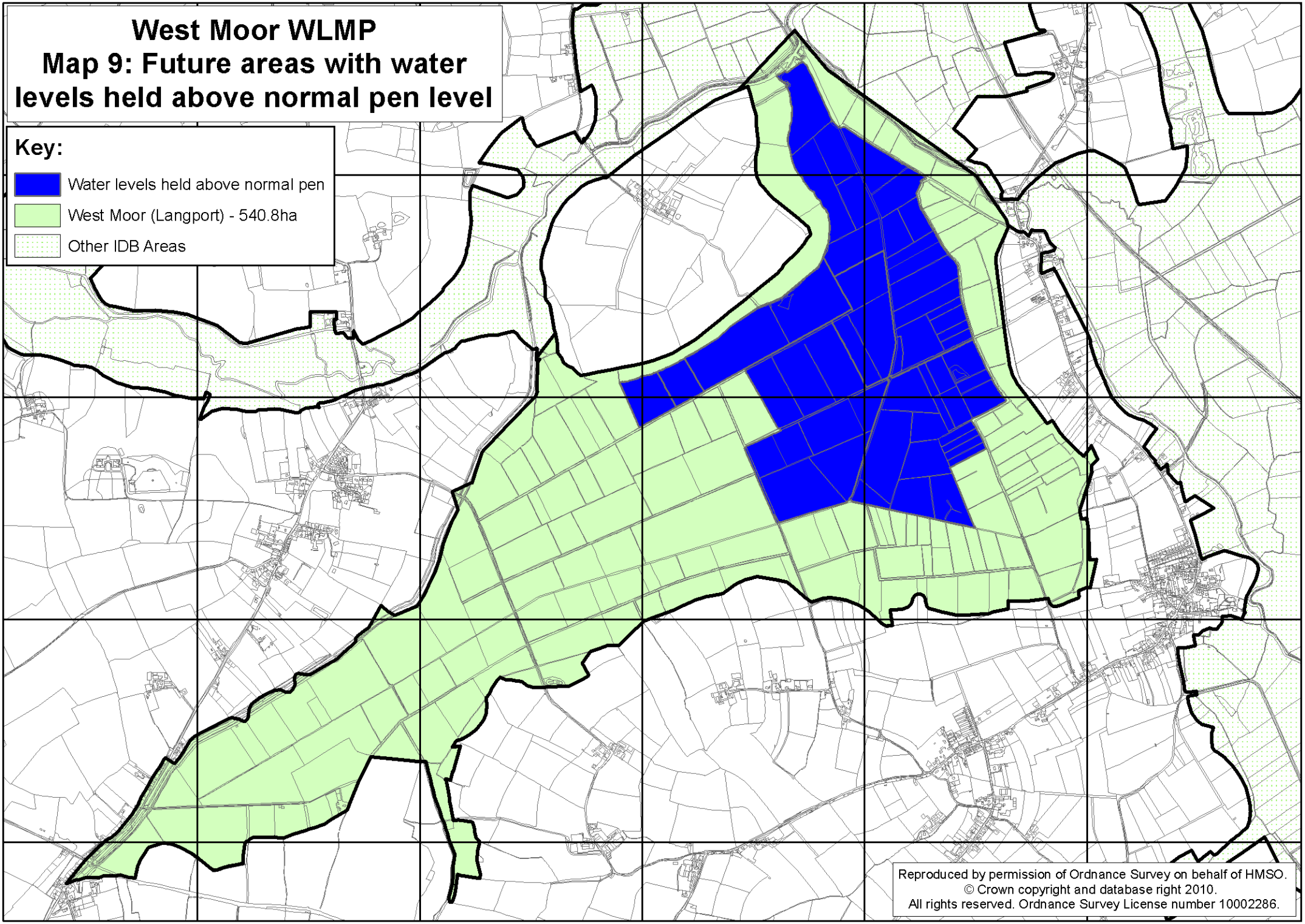
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West Moor WLMP
Map 8: Flood zones within the plan area



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West Moor WLMP
Map 9: Future areas with water levels held above normal pen level



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