

Appendix F Revised Environmental Action Plan (EAP)

National Environmental Assessment Service

Environmental Action Plan

Project name	River Sowy and King Sedgemoor's Drain Enhancements Scheme: Phase 1
Project Reference	ENVRESW001353
Area	South West
Date	15/06/2021
Version number	11
Author	Megan David/Miriam Olivier

Revision history

Revision date	Summary of changes	Author	Version number
23/07/20	Update to reflect scheme design changes and internal review comments	Miriam Olivier	3
03/09/20	Update to reflect outcome of pre-construction ecology surveys	Miriam Olivier	4
17/09/20	SSSI Assent Measures Added	Gary Cutts	5
26/09/20	Split into Phase 1a and Phase 1b works	Miriam Olivier	6
09/10/20	Amended to reflect revised scope of works for Phase 1a	Miriam Olivier	7
22/10/20	Updated to include FBG review and revised scope of works for Phase 1a	Miriam Olivier	8
08/03/21	Phases 1a and 1b dates updated	Steve Maddison	9
24/03/21	Updated to reflect Phase 1a March 21 scope	Miriam Olivier	10
15/06/21	Updated to reflect additional measures identified through ES addendum preparation and revisions to SSSI Assent, Project level HRA Stage 2 Report and Detailed WFD Compliance Report	Miriam Olivier	11

EAP Approvals

Name	Signature	Title	Date	Version

Distribution

Name	Title	Date	Version

Purpose

This Environmental Action Plan (EAP) summarises the actions required to implement the environmental mitigation and outcomes contained within the Environmental Statement (ES) that will be prepared following the Environment Agency's Minimum Technical Requirements. It sets out specific objectives and targets defining the way in which we wish the ES and its relevant findings to be addressed during the implementation phase of the project (detailed design, construction and post-construction phases). It also details roles and responsibilities of those involved in the proposal and refers to all **temporary** and **permanent** works.

These actions form part of the contract documentation and must be adhered to.

Roles

Each action in the table below has **one** named person or organisation who is responsible for ensuring that the action is implemented. It is ultimately the contractor's responsibility for ensuring the EAP commitments, which may include planning conditions, are delivered.

The EA National Environmental Assessment and Sustainability (NEAS) team are responsible for agreeing any changes to the EAP and for signing off, or agreeing to the signing off of, the actions.

The contractor and Project Manager are responsible for advising NEAS on any changes to method statements or the planned construction work as these may result in changes to the EAP or additional consultation with statutory consultees. NEAS will assess the significance of these changes and determine the appropriate course of action.

The contractor is also responsible for implementing good environmental practice on site, in line with their own environmental management systems (EMS). The environmental clerk of works (ECoW) will monitor adherence to the EMS and EAP. Typical issues include:

- Any working hour restrictions
- Dust suppression measures
- Traffic management
- Site waste management
- Materials management
- Maintenance of the carbon calculator
- Vehicle maintenance and management
- Pollution prevention and control (including storage, refuelling and incident response)
- Response procedures e.g. services strike, contaminated land
- Hazardous materials handling and storage
- Noise management
- Securing and delineation of working areas including signage
- Vegetation protection measures

Environmental Audits

The appended template should be used when undertaking any site audits during construction. Such audits can be undertaken by NEAS Environmental Project Managers (EPM) or delegated by NEAS to the ECoW or other individuals. Technical assistance can be obtained from functional staff as appropriate. Site audits can potentially highlight good practice and can be separate to the

review of EAP actions as undertaken in progress meetings. They do not replace the regular checks undertaken by the ECoW during the works; no set template has been provided for this.

Environmental Incident Reporting system

All environmental incidents must be reported to the Environment Agency Incident Hotline 0800 80 70 60 as per the [Environmental Incident Reporting Poster](#) at the earliest opportunity and then to the ECC Project Manager, Site Supervisor, Environment Agency Project Manager and Environment Agency NEAS Environmental Project Manager. In addition, near misses must be reported via the hotline where there was/is the potential for a significant impact and where lessons can be learned.

Initial reports for such incidents and near misses must be followed by a written report using the contractor's in-house forms. This must include the following information (project/location, date, contractor, NIRS reference number, details of what happened, cause of incident, lessons learned). This final and comprehensive investigation report is to be provided by the Contractor to the ECC Project Manager, Environment Agency Project Manager and Safety, Health and Environment Manager within 14 days.

Summary of scope of works

Phase 1 of the River Sowy and King's Sedgemoor Drain Enhancements Scheme (referred to as the Scheme) focusses on capacity enhancements between Monk's Leaze Clyce on the Sowy and Parchey Bridge on the KSD as shown in Figure 1. These include (i) raising existing informal flood embankments and (ii) channel widening through creation of seven Water Framework Directive (WFD) enhancement features (embayments, lengths of two-stage channel and back waters) and (iii) raising the headwall of two existing water control structures on the KSD (Cossington Right Rhyne outfall and Chilton Right Rhyne outfall). Strengthening works to two culvert crossings of Chedzoy New Cut and Cossington Right Rhyne are also required to facilitate plant access.

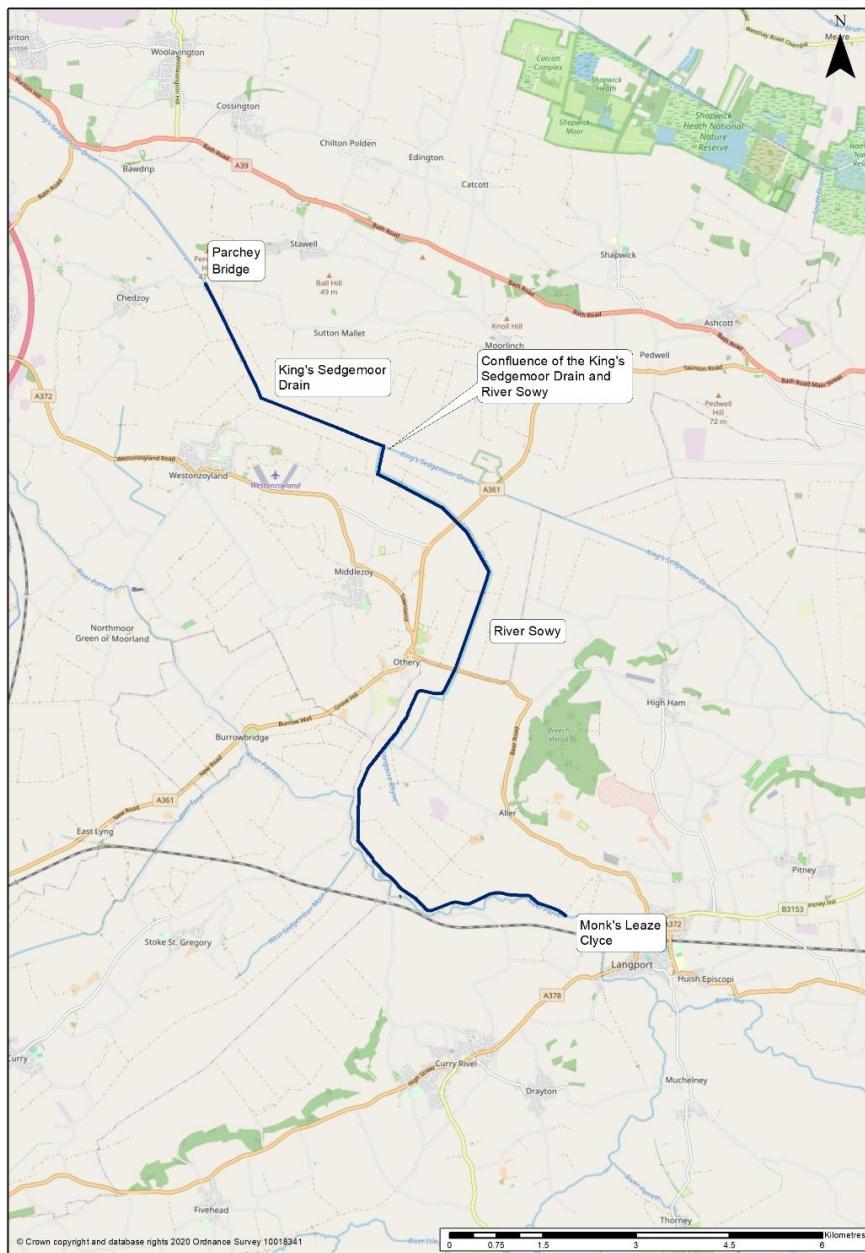


Figure 1 Scheme location

The works will be undertaken in two phases: Phase 1a (March 2021, with vegetation clearance for water vole displacement ongoing until Phase 1b commences) and Phase 1b (August 2021 – October 2021, with vegetation clearance for access during July 2021).

Phase 1a

Works to be undertaken under Phase 1a include the following:

- Scrub and field boundary vegetation clearance for access on the left bank of the KSD and left bank of the Lower Sowy (July 2021)
- Raising of existing informal flood embankments on the Upper Sowy using material won under CL:AIRE from an offsite source (June or July 2021)
- Vegetation clearance for water vole displacement under the EA's organisational licence (WML OR 23) on the right bank of the KSD and Lower Sowy (March 2021 until commencement of Phase 1b)
- Tree removals on the right bank of the KSD and Lower Sowy (June or July 2021)

No access to the right bank of the KSD will be required under Phase 1a except for tree removals and ongoing vegetation maintenance required under WML OR23 organisational licence at the Water Framework Directive (WFD) enhancement features (embayments, two-stage channels and back water) locations and at Chilton Right Rhyne and Cossington Right Rhyne outfalls.

As Phase 1a does not require tracking along the KSD at a frequency above the baseline usage which includes sporadic use by excavators, the conditions of the SMC do not apply to Phase 1a.

Phase 1b

Further works to be completed in 2021 as part of Phase 1b will include raising of the existing informal flood embankments on the KSD and Lower Sowy, excavation and planting of the Water Framework Directive (WFD) enhancement features (embayments, two-stage channels and back water) and upgrading of the Chilton Right Rhyne and Cossington Right Rhyne outfalls. Material required for raising of the existing informal embankments on the KSD will be won through reprofiling of existing embankments towards the north of the site. Material required for raising of the existing informal embankments on the Lower Sowy will be obtained under CL:AIRE from an offsite location, with material won from creation of WFD enhancement features also used for bank raising where suitable..

Please note that the numbering of measures within the EAP follows that set out within the Environmental Statement for the Scheme (document reference: ENVRESW001353-CH2-XX-400-RP-EN-1042), with additional measures added following completion of pre-construction surveys and consenting conditions are completed. The numbering of measures is therefore not contiguous throughout the document.

Relevant contact details

Project Sponsor	Rachel Burden	020 302 50283/07771 674639
Project Executive	Graham Quarrier	0203 0252248/07909 534620
Project Manager	Gary Cutts	020771 40686/07976 861 553
NEAS	Will MacLennan	020 8474 5492/ 07385 426998
ECoW	To be confirmed by the Environment Agency	To be confirmed
Project geomorphologist	To be confirmed by the Environment Agency	To be confirmed
LCoW	To be confirmed by the Environment Agency	To be confirmed
Contractor	Matt Phillips (Kiers)	To be confirmed

Site Supervisor	To be confirmed	To be confirmed
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Environmental Action Plan

Ref. No.	Objective	Action	Relevant phase	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
A. Pre-construction							
General							
A1	Compliance with environmental legislation and/or conditions of consent for the Scheme under EIA legislation	<p>Comply with all measures identified in:</p> <ol style="list-style-type: none"> 1. this EAP 2. the Environmental Statement (ES) and ES Addendum for Scheme (including any conditions imposed by the determining authority at consenting stage) 3. the Landscape Masterplan (LMP) for the Scheme, including provision of between seven WFD enhancement features as identified in this document 4. the Landscape Maintenance and Management Plan (LMMP) 5. any Protected Species (PS) licences found to be required following further ecological survey effort as detailed in the ES and EAP 6. Scheduled Monument Consents (SMCs), including any conditions imposed by Historic England (HE) on determination 	<p>Phase 1a (measures 1, 2, 5) Phase 1b (all measures)</p>	<p>EA (where identified in the following measures) Contractor (where identified in the following measures)</p>	<p>ES (document reference: ENVRESW001353-CH2-XX-400-RP-EN-1042) ES Addendum (document reference: ENVRESW001353-CH2-XX-400-RP-EN-1127) LMP (drawing numbers: ENVRESW001353-CH2-XX-400-DR-EN-5425 to 5439) LMMP (Document reference: ENVRESW001353-CH2-ZZ-400-PL-EN-1096)</p>		

Sowy and King's Sedgemoor Drain (KSD) Enhancements Scheme: Phase 1

Ref. No.	Objective	Action	Relevant phase	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
Water							
A2	Reduce the risk of pollution of the water environment.	Produce an Emergency Pollution Response Plan (EPRP)	Phase 1a Phase 1b	Contractor			
A3	Reduce the risk of pollution of the water environment.	Produce a Surface Water Management Plan (including measures to minimise site runoff) (SWMP) in agreement with our internal technical specialists	Phase 1a Phase 1b	Contractor			
A4	Reduce the risk of pollution of the water environment.	Register for flood warnings	Phase 1a Phase 1b	Contractor			
A5	Prevent the spread of invasive species	Carry out pre-construction survey for non-native invasive plant species.	Phase 1a	EA	Pre-construction INNS survey report (Phase 1a only): ENVRESW001353-CH2-XX-400-RP-EN-1117	Pre-construction INNS survey and reporting complete for Phase 1a. Note: Parrot's Feather was identified at Othery Rhyne near Egypt's Clyse subsequent to preparation of the Pre-construction INNS Survey Report	
A6	Prevent the spread of invasive species	Develop Invasive Species Management Plan in accordance with the recommendations provided in the INNS survey report and to include as a minimum: site briefings, cleaning of plant between moving locations, and checking for	Phase 1a Phase 1b	Contractor		Note: Parrot's Feather was identified at Othery Rhyne near Egypt's Clyse subsequent to preparation of the	

Sowy and King's Sedgemoor Drain (KSD) Enhancements Scheme: Phase 1

Ref. No.	Objective	Action	Relevant phase	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
		presence of INNS in excavated soils. Update EAP in accordance with MS requirements, ensuring responsibility and frequency of monitoring or treatment actions is made clear.				Pre-construction INNS Survey Report	
A7	Reduce the risk of pollution of the water environment.	Identify areas of possible contamination on the Site Management Plan and erect signage to indicate them on site.	Phase 1a Phase 1b	Contractor			
A25	Minimise risks to bivalves	Prepare Method Statement for recovery of bivalves from material excavated during construction of WFD enhancement works, to be agreed with EA technical specialists.	Phase 1b	Contractor		Not relevant to Phase 1a	N/A
Flora and Fauna							
A8	To minimise the risk of loss/injury of otters and ensure compliance with the Wildlife and Countryside Act 1981 (as amended) and the Species and Habitats Regulations 2017.	<ul style="list-style-type: none"> Carry out pre-construction check for otter holts should be conducted prior to works commencing. If otter holts present an European Protected Species (EPS) licence may be required to permit activities that would otherwise be unlawful 	Phase 1a Phase 1b	Contractor	Pre-construction otter survey report: ENVRESW001353-CH2-XX-400-RP-EN-1116	Pre-construction survey check for Phase 1a complete. Camera trap monitoring of potential holt complete (08/09/20). No further mitigation recommendations made with respect to Phase 1a.	
A9	Minimise risk of loss/injury of badgers ensure compliance with the Protection of	<ul style="list-style-type: none"> A pre-construction survey should be undertaken to determine if any new badger setts are present on site. Where active badger setts would lost/disturbed by the works a licence 	Phase 1a Phase 1b	Contractor	Pre-construction badger survey report: ENVRESW001353-CH2-XX-400-RP-EN-	Phase 1 pre-construction survey completed.	

Sowy and King's Sedgemoor Drain (KSD) Enhancements Scheme: Phase 1

Ref. No.	Objective	Action	Relevant phase	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
	Badgers Act 1992	may be required to permit activities that would otherwise be unlawful.			1107 Method Statement (all setts Phase 1a, and setts 1,3, 9 and 10 for Phase 1b): ENVRESW001353-CH2-XX-400-MS-EN-1122		
A10	Avoid loss of trees with potential bat roost features.	<ul style="list-style-type: none"> Trees with bat roost potential that are proposed for removal would be subject to appropriate survey effort to determine likely presence/absence of a roost. Trees found to be roosts would be retained. Pre-construction check of trees with bat roost potential proposed for removal would also be carried out immediately prior to felling. 	Phase 1a	Contractor	Pre-construction bat survey report: ENVRESW001353-CH2-XX-400-TN-EN-1112	Pre-construction bat survey completed in 2020– no roosts found. Pre-construction survey and check to be carried out prior to tree removal in Phase 1a.	
A24	To minimise the risk of loss/injury of otters and ensure compliance with the Wildlife and Countryside Act 1981 (as amended) and the Species and Habitats Regulations 2017.	Camera trap monitoring survey for potential otter holt on the right bank of the KSD identified during pre-construction survey. Implement any further mitigation measures identified following completion of the camera trap monitoring survey.	Phase 1a	EA	Pre-construction otter survey report: ENVRESW001353-CH2-XX-400-RP-EN-1116	Camera trap survey complete: 08/09/2020 No further mitigation requirements identified for Phase 1a as potential holt identified during pre-construction survey no longer present.	
A25	To minimise direct	Displacement of water vole from working	Phase 1a	EA under advice	Pre-construction water		

Sowy and King's Sedgemoor Drain (KSD) Enhancements Scheme: Phase 1

Ref. No.	Objective	Action	Relevant phase	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
	loss or injury of water voles and the loss of burrows.	areas at seven WFD enhancement areas and Cossington Right Rhyne outfall and Chilton Right Rhyne outfalls in accordance with EA organisational licence (WML OR23) in advance of construction activities commencing.		from accredited ecologist on WML OR23 licence)	vole survey report: ENVRESW001353-CH2-XX-400-TN-EN-1111		
A26	Minimise risk of loss/injury of badgers ensure compliance with the Protection of Badgers Act 1992	Contractor to erect weighted traffic cones and blue rope prior to works as indicated by post markers already on site, located at badger setts 2, 2a and 7. The fencing shall act as a guide and boundary for tracking plant to avoid damage to setts. Modification of sett entrances at sett 7 Any additional mitigation measures as recommended by the client's ecologist following completion of the Phase 1b pre-construction badger survey (see measure A9)	Phase 1b	Contractor (erection of traffic cones and blue rope fencing) EA (modification of sett entrances at sett 7)	EA Pre-construction survey report: 'Sowey River and King's Sedgemoor Drain Up-Date Survey for Badger Setts' (February 2021) – N.B blue cones and rope to replace Heras fencing, as agreed between NEAS and Country Contracts		
Cultural Heritage							
A11	Mitigate impact on archaeological remains and deposits of paleoenvironmental and geoarchaeological interest	Produce Written Scheme of Investigation (WSI) in agreement with internal technical specialists, South West Heritage Trust (SWHT) and Historic England (HE).	Phase 1b	EA	Draft WSI: ENVRESW001353-CH2-XX-400-RP-EN-1095	Draft WSI to be updated by Cotswold Archaeology prior to commencement of Phase 1b	
A12	Compliance with Ancient Monuments	Obtain SMCs for (i) tracking across SM and (ii) bank raising works within scheduled	Phase 1b	EA	SMC submission documents:	SMC S00240209 (plant tracking)	

Sowy and King's Sedgemoor Drain (KSD) Enhancements Scheme: Phase 1

Ref. No.	Objective	Action	Relevant phase	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
	and Archaeological Areas Act (1979)	area			ENVRESW001353-CH2-XX-400-RP-EN-1103 (plant tracking – ref S00240209) and ENVRESW001353-CH2-XX-400-RP-EN-1128 (bank raising – ref S00241479) SMC S00240209 (plant tracking) and associated documents (see Appendix 11 of the ECC Scope: document reference ENVRESW001353-CH2-XX-400-SO-Z-1084)	conditions have been added to the EAP SMC S00241479 (bank raising) application submitted 09/06/21 and acknowledged 10/06/21.	
A25	Compliance with Ancient Monuments and Archaeological Areas Act (1979)	Implement any mitigation identified as being required pre-construction, construction or post-construction as part of the SMC application process.	Phase 1b	Contractor	See measures A27-A29, and B42-B45	Not relevant to Phase 1a	N/A
A27	Compliance with Ancient Monuments and Archaeological Areas Act (1979)	At least 48 hours' notice (or such shorter period as may be mutually agreed) in writing of the commencement of each phase of work shall be given to Dr Helen Woodhouse (helen.woodhouse@HistoricEngland.org.uk) in order that a Historic England representative can inspect and advise on the works and their effect in compliance	Phase 1b	Contractor		Not relevant to Phase 1a	N/A

Sowy and King's Sedgemoor Drain (KSD) Enhancements Scheme: Phase 1

Ref. No.	Objective	Action	Relevant phase	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
		with this consent.					
A28	Compliance with Ancient Monuments and Archaeological Areas Act (1979)	All those involved in the implementation of the works granted by this consent must be informed by the Environment Agency that the land is designated as a scheduled monument under the Ancient Monuments and Archaeological Areas Act 1979 (as amended); the extent of the scheduled monument as set out in both the scheduled monument description and map; and that the implications of this designation include the requirement to obtain Scheduled Monument Consent for any works to a scheduled monument from the Secretary of State prior to them being undertaken	Phase 1b	EA		Not relevant to Phase 1a	N/A
A29	Compliance with Ancient Monuments and Archaeological Areas Act (1979)	No works shall take place until the applicant has confirmed in writing that the ground protection measures will be installed in accordance with a method statement in the interests of avoiding damage to the archaeological remains of the scheduled monument which has been submitted to and approved by the Secretary of State advised by Historic England	Phase 1b	EA		Not relevant to Phase 1a	N/A

Resource and Waste Management

A14	To minimise the amount of waste produced.	Develop a Materials Management Plan (MMP) to be followed throughout the scheme.	Phase 1a Phase 1b	Contractor			
A15	Ensure any waste is	Develop a Site Waste Management Plan	Phase 1a	Contractor			

Sowy and King's Sedgemoor Drain (KSD) Enhancements Scheme: Phase 1

Ref. No.	Objective	Action	Relevant phase	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
	disposed of appropriately	(SWMP) to be followed throughout the scheme.	Phase 1b				
Population and Human Health							
A16	To minimise disruption to agricultural businesses	<ul style="list-style-type: none"> Liaise with agricultural businesses to understand access needs and timings of key agricultural practices and plan construction access and works accordingly 	Phase 1a Phase 1b	EA			
A17	To minimise disruption to agricultural businesses	<ul style="list-style-type: none"> Liaise with agricultural businesses regarding temporary and permanent land take requirements, including any financial compensation for landowners Provide clear accessible public information regarding proposed works for agricultural landowners 	Phase 1a Phase 1b	EA		For Phase 1a: <ul style="list-style-type: none"> 3 comms letters and 2 notices of access to landowners Vegetation removal schedule sent to all affected landowners Individual meetings held with all landowners. Publicity banners to be displayed on site throughout Phase 1a works 	

Sowy and King's Sedgemoor Drain (KSD) Enhancements Scheme: Phase 1

Ref. No.	Objective	Action	Relevant phase	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
A18	Minimise disruption to recreational users of Public Rights of Way (PRoW) and bird watchers	<p>Inform the local community of the nature and duration of works and alternative provisions of access through signage and webpage updates</p> <p>Inform local communities within the study area about the proposed haulage routes through signage and webpage updates. In addition, notices should also be placed on PRoW immediately adjacent to the proposed haulage routes prior and during the construction period to notify users of these PRoW.</p>	Phase 1a Phase 1b	Contractor			
Landscape							
A19	Minimise adverse effects on landscape and visual amenity receptors	Confirm material excavated from WFD enhancement features to ensure material is suitable for reseeding and can be utilised in reprofiling of embankments without generating adverse impacts on landscape and visual amenity.	Phase 1b	Landscape Clerk of Works (LCoW) (client provided)		Not relevant to Phase 1a	N/A
A20	Minimise adverse effects on landscape and visual amenity receptors	Implement any design mitigation measures identified through the Tree Survey and Arboricultural Impact Assessment (AIA) (including 'Heads of Terms' Arboricultural Method Statement (AMS)) to ensure tree retention is prioritised	Phase 1b	Contractor	AIA and TCP: ENVRESW001353-CH2-XX-400-RP-EN-1118 AMS: ENVRESW001353-CH2-XX-400-MS-EN-1120	AIA, TCP and AMS complete (18/09/20)	
A21	Minimise adverse effects on landscape	Develop site specific AMS based on 'Heads of Terms' AMS and final scheme design (if	Phase 1b	Contractor	AMS: ENVRESW001353-	AMS complete (18/09/20). No	

Sowy and King's Sedgemoor Drain (KSD) Enhancements Scheme: Phase 1

Ref. No.	Objective	Action	Relevant phase	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
	and visual amenity receptors	required)			CH2-XX-400-MS-EN-1120	update needed as no change to scheme design required.	
Air Quality							
A22	To minimise the impact of dust emissions on human and ecological receptors.	Implement appropriate mitigation measures as recommended in Institute of Air Quality Management (IAQM) guidance Assessment of Dust from Demolition and Construction (IAQM, 2016).	Phase 1b	Contractor	IAQM guidance Assessment of Dust from Demolition and Construction (IAQM, 2016)		
A23	To minimise the impact of dust during construction.	Develop and implement a Dust Management Plan (DMP) in agreement with the EA.	Phase 1b	Contractor	IAQM guidance Assessment of Dust from Demolition and Construction (IAQM, 2016)		
Climate							
None identified							
Traffic							
A24	To minimise the impact from construction vehicles.	Prepare a Construction Traffic Management Plan (CTMP), which will set out measures to mitigate risks and minimise their impact of construction vehicles.	Phase 1a Phase 1b	Contractor			
B. During construction							
Water							
B1	To minimise risks to water quality and of harm to fish and aquatic ecology	<ul style="list-style-type: none"> During summer months take dissolved oxygen (DO) readings whilst undertaking channel works to ensure water quality does not deteriorate 	Phase 1b	Contractor, as advised by ECoW		Not relevant to Phase 1a	N/A

Sowy and King's Sedgemoor Drain (KSD) Enhancements Scheme: Phase 1

Ref. No.	Objective	Action	Relevant phase	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
		<p>rapidly. If DO levels drop below 20%, all operations stop immediately, and inform client of the need to cease the operation of pumping stations</p> <ul style="list-style-type: none"> • Stop works if the works combined with higher temperatures threaten to deplete dissolved oxygen as advised by the ECoW. • Construction programming to include contingency for changing the work rate and/or methodology if needed. 					
B2	To minimise risk of water pollution	Toolbox talks regarding water quality risks	Phase 1a Phase 1b	ECoW (client provided)			
B3	To minimise risk of water pollution and to ensure best ecological value obtained by guiding design of features to suit individual sites	Suitably experienced ECoW and project geomorphologist to advise the contractor on the creation of WFD enhancement features	Phase 1b	EA ECoW (client provided) Project geomorphologist (client provided)		Not relevant to Phase 1a	N/A
B4	To minimise risk of water pollution	Use of silt curtains/booms for in channel works	Phase 1b	Contractor		Not relevant to Phase 1a	N/A
B5	To minimise risk of water pollution	Use impermeable bases, flood bunds, and temporary covering of exposed material to minimise risks of leachate from material stockpiles	Phase 1b (Note: assumes no stockpiling required for Phase 1a)	Contractor		Not relevant to Phase 1a	N/A
B6	To minimise risk of water pollution	Use of drip trays, which will be of adequate capacity and regularly maintained	Phase 1a Phase 1b	Contractor			

Sowy and King's Sedgemoor Drain (KSD) Enhancements Scheme: Phase 1

Ref. No.	Objective	Action	Relevant phase	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
B7	To minimise risk of water pollution	Store fuels in appropriately bunded areas, with refuelling activities will take place in designated areas away from the river	Phase 1a Phase 1b	Contractor			
B8	To minimise risk of water pollution	Compliance with best practice pollution prevention measures	Phase 1a Phase 1b	Contractor			
Flora and Fauna							
B9	To minimise the disturbance of qualifying wintering bird features.	Ensure that there are working restrictions in the event of any severe, cold weather that would make bird displacement due to disturbance an issue.	Phase 1a Phase 1b	ECoW (client provided)			
B10	To minimise the disturbance of qualifying wintering bird features.	Suitably experienced ECoW to monitor and record presence of any significant numbers of birds (>1% of the current 5-year peak mean for any species) within the disturbance zone of influence (up to 250m), identify any potentially unforeseen impacts and alert EA PM accordingly.	Phase 1a Phase 1b	ECoW (client provided)			
B11	To reduce the loss of suitable foraging and roosting habitat for wintering bird features of designated sites	Implement measures identified in River Sowy and King's Sedgemoor Drain Enhancement Scheme Mitigation Action Plan (MAP) Version 5 as provided in Appendix J of the ES for the Scheme and Appendix A of this document.	Phase 1a Phase 1b	EA NE SDBC (individual measures as indicated with MAP, Appendix A)	ES (document reference: ENVRESW001353-CH2-XX-400-RP-EN-1042)		
B12	To minimise risk of loss or damage to notable habitats (coastal grazing marsh) and notable plant species (water	Install protective fencing and define working areas to exclude construction areas from surrounding habitats of value to be retained.	Phase 1b	Contractor	LMP (drawing numbers: ENVRESW001353-CH2-XX-400-DR-EN-5425 to 5439) Note: LMP and LMMP	Not relevant to Phase 1a	N/A

Sowy and King's Sedgemoor Drain (KSD) Enhancements Scheme: Phase 1

Ref. No.	Objective	Action	Relevant phase	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
	dropwort and frogbit)				to be updated during consenting process for Phase 1b works		
B13	To minimise risk of loss or damage to notable habitats (coastal grazing marsh)	<ul style="list-style-type: none"> Reseeding of grassland areas with an appropriate seed mix (to be agreed with NE). Riparian planting to one backwater WFD enhancement feature, planting of WFD enhancement features with pre-vegetated coir rolls/pallets and reseeding of disturbed channel bank areas with appropriate seed mix (to be agreed with NE) 	Phase 1b	Contractor	<p>LMP (drawing numbers: ENVRESW001353-CH2-XX-400-DR-EN-5425 to 5439)</p> <p>Note: LMP and LMMP to be updated during consenting process for Phase 1b works</p>	Not relevant to Phase 1a	N/A
B14	To minimise risk of loss/mortality or damage/disturbance to priority habitat, notable plant species, eel, water vole and aquatic invertebrates	<p>Implementation of standard good practice measures to control risk of water pollution through run-off/drainage management as detailed in the EPRP and SWMP</p> <p>Minimising the temporary working area required for tracking across the embankment and/or embankment (SSSI and non-SSSI). Temporary working area shown in general arrangement plans.</p>	Phase 1a Phase 1b	Contractor	<p>General arrangement plans: ENVRESW001353-CH2-ZZ-4KS-DR-C-2011-2013</p>		
B15	To minimise disturbance of qualifying wintering bird features within statutory designated and non-designated sites	<p>No working or lighting after dark close to any areas known to be favoured by birds (to be identified and agreed with NE)</p> <ul style="list-style-type: none"> All works on site, including commuting to and from the working area, to commence during daylight hours only and cease at least two hours before 	Phase 1a Phase 1b	Contractor (following advice of ECoW)			

Sowy and King's Sedgemoor Drain (KSD) Enhancements Scheme: Phase 1

Ref. No.	Objective	Action	Relevant phase	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
		<p>sunset.</p> <ul style="list-style-type: none"> • If works undertaken in autumn, minimise unnecessary, sudden noise generated by plant e.g. sudden revving of engines, loud music/radio or shouting. Ensure use of a modern plant fitted with appropriate noise silencers. • If works undertaken in autumn, undertake as much preparatory work as possible before arriving on site (from within the site compound). • Stop works to the SSSI during periods of severe weather and minimising time that plant or personal are in the working area to minimise disturbance to breeding and roosting birds. • All works will stop if the temperature during any 24-hour period falls below 0°C for 7 consecutive days. Works will restart when 48 hours have passed that do not fulfil the criteria for freeing conditions (the temperature does not remain below 0°C for eighteen consecutive hours). Daily temperature readings to be logged throughout the works, using a maximum and minimum thermometer located within the site compound. 					
B42	To minimise	<ul style="list-style-type: none"> • If works undertaken in November, an 	Phase 1b	EA		Not relevant to Phase	N/A

Sowy and King's Sedgemoor Drain (KSD) Enhancements Scheme: Phase 1

Ref. No.	Objective	Action	Relevant phase	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
	disturbance of qualifying wintering bird features within statutory designed and non-designated sites	<p>ornithological watching brief is required to monitor for birds within the area of works of the SSSI</p> <ul style="list-style-type: none"> Weekly calls with NE shall be set up to provide regular communications, update on conditions and results of ornithological watching brief. 		ECoW (client provided)		1a	
B16	To reduce the risk of direct loss of aquatic invertebrates	Pull back excavated material by a short distance from the margin of the existing river and allow to rest for a short time to allow animals that can escape back in to the water.	Phase 1b	Contractor		Not relevant to Phase 1a	N/A
B17	To reduce the risk of death or injury to great crested newt (GCN) and grass snakes.	Carry out vegetation works under a method statement (to include two-stage clearance) and supervision by an ECoW	Phase 1a Phase 1b	Contractor	Reptile MS: ENVRESW001353-CH2-XX-400-MS-EN-1110		
B18	To reduce the risk of disturbance of breeding birds (both those which are qualifying features or designated sites and those which are not)	Works shall be conducted outside of the main breeding bird period (March to August inclusive) where practicable, and ECoW should check potential nesting habitat prior to construction works. Vegetation clearance will be undertaken in a phased and directional manner. Where nesting is occurring, appropriate restrictions for the species shall be put in place to avoid the nest from being damaged or abandoned	Phase 1a Phase 1b	Contractor (as advised by ECoW)	SSSI Assent V3 02/06/2021HRA1 (Record of screening for significant effects) ref: 1353/SOWYKSD/VEG/TREE/HRAv2		
B19	Minimise risk of disturbance/mortality	Carry out works under a Badger Method Statement.	Phase 1a Phase 1b	Contractor (as advised by	Badger Method Statement:		

Sowy and King's Sedgemoor Drain (KSD) Enhancements Scheme: Phase 1

Ref. No.	Objective	Action	Relevant phase	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
	of badgers ensure compliance with the Protection of Badgers Act 1992		(Note: Badger Method Statement may require update pending outcome of Phase 1b pre-construction surveys)	ECoW)	ENVRESW001353-CH2-XX-400-MS-EN-1122		
B20	To minimise direct loss or injury of water voles and the loss of burrows.	<ul style="list-style-type: none"> Maintain 5m buffer from all watercourses except in areas where displacement has been completed under EA organisational licence WML OR23 Pre-construction checks for burrows at any locations where a 5m standoff from watercourses cannot be maintained. 	Phase 1a Phase 1b	EA (displacement and vegetation maintenance until commencement of construction, and ecological supervision throughout construction) Contractor (post-commencement of construction, including vegetation maintenance and destructive	Pre-construction water vole survey report: ENVRESW001353-CH2-XX-400-TN-EN-1111 EA organisational licence: WML OR23	Pre-construction check complete. Displacement required for works near outfalls.	

Sowy and King's Sedgemoor Drain (KSD) Enhancements Scheme: Phase 1

Ref. No.	Objective	Action	Relevant phase	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
				searches)			
B46	Minimise risks to bivalves	Implement Bivalve Method Statement during construction and management of WFD enhancement features	Phase 1b	Contractor		Not relevant to Phase 1a	N/A
B47	Minimise risks to habitats and features of King's Sedgemoor SSSI	Phase 1a works to be carried out outside 1 st -31 st March 2021	Phase 1a	Contractor	SSSI Assent V3 02/06/2021		
B48	Minimise risks to habitats and features of King's Sedgemoor SSSI	Access to King's Sedgemoor SSSI for Phase 1a vegetation clearance works would be via the raised flood bank on the left bank of the River Sowy.	Phase 1a	Contractor	SSSI Assent V3 02/06/2021		
B49	Minimise risks to habitats and features of King's Sedgemoor SSSI - invertebrate assemblages	All access routes and working areas subject to ecological check prior to Phase 1a vegetation clearance works commencing.	Phase 1a	ECoW (client provided)	SSSI Assent V3 02/06/2021		
B50	Minimise risks to habitats and features of King's Sedgemoor SSSI – M22, MG13, MG5 and MG8 grassland	All vegetation cleared using tractor and flail,	Phase 1a	Contractor	SSSI Assent V3 02/06/2021		
B51	Minimise risks to habitats and features of King's Sedgemoor SSSI –	Vegetation to be inspected for evidence of otter prior to clearance. Vegetation clearance undertaken in phased manner and under ecological supervision.	Phase 1a	EcoW (client provided)	SSSI Assent V3 02/06/2021		

Sowy and King's Sedgemoor Drain (KSD) Enhancements Scheme: Phase 1

Ref. No.	Objective	Action	Relevant phase	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
	otter						
B52	Avoid risk of disturbance to Schedule 1 breeding birds	All access routes and working areas plus any areas of potentially suitable habitat within a 50m buffer will be subject to an ecological check prior to any works starting. If the ECoW identifies any nests during this walkover the nest will be cordoned off as per normal ecological best practice.	Phase 1a	ECoW (client provided)	SSSI Assent V3 02/06/2021HRA1 (Record of screening for significant effects) ref: 1353/SOWYKSD/VEG/TREE/HRAv2		
Cultural Heritage							
B21	Minimise risks to Prehistoric wooden trackway located approximately 670m to the south-east of Parchey Bridge (NHLE 1014430)	Install temporary matting where vehicle access required, and implement any other measures identified as required within SMCs tracking over SM and bank raising within SM) and conditions. Archaeological monitoring of groundworks in accordance with archaeological WSI (as per A11)	Phase 1b	Contractor	LMP (drawing numbers: ENVRESW001353-CH2-XX-400-DR-EN-5425 to 5439)	Not relevant to Phase 1a	N/A
B22	Minimise risks to non-designated heritage assets as identified on the LMPs LMP (drawing numbers: ENVRESW001353-CH2-XX-400-DR-EN-5425 to 5439)	Archaeological monitoring of groundworks during topsoil stripping in accordance with archaeological WSI (as per A11)	Phase 1a Phase 1b	Contractor	LMP (drawing numbers: ENVRESW001353-CH2-XX-400-DR-EN-5425 to 5439)	Not relevant to Phase 1a	N/A
B23	Minimise risks to unstratified finds	Archaeological monitoring of groundworks augmented by metal detector survey in	Phase 1b	Contractor	LMP (drawing numbers:	Not relevant to Phase 1a	N/A

Sowy and King's Sedgemoor Drain (KSD) Enhancements Scheme: Phase 1

Ref. No.	Objective	Action	Relevant phase	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
	within the Battle of Sedgemoor Registered Battlefield (NHLE 1000032)	accordance with archaeological WSI (as per A11)			ENVRESW001353-CH2-XX-400-DR-EN-5425 to 5439)		
B24	Minimise risks to previously unknown archaeological assets and deposits of paleoenvironmental and geoarchaeological interest	Archaeological investigation and recording (excavation and recording if preservation in-situ not achievable) in accordance with archaeological WSI (as per A11) during creation of WFD enhancement features (embayments, two stage channels and backwater)	Phase 1b	Contractor	LMP (drawing numbers: ENVRESW001353-CH2-XX-400-DR-EN-5425 to 5439)	Not relevant to Phase 1a	N/A
B25	Minimise risks to previously unknown archaeological assets (prehistoric metalwork and later finds) in the Greylake area	Archaeological monitoring of groundworks augmented by metal detector survey in accordance with archaeological WSI (as per A11)	Phase 1b	Contractor	LMP (drawing numbers: ENVRESW001353-CH2-XX-400-DR-EN-5425 to 5439)	Not relevant to Phase 1a	N/A
B42	Compliance with Ancient Monuments and Archaeological Areas Act (1979)	Photographs to a scale and quality to be agreed in writing shall be prepared of the monument before the start and after completion of each episode of the works and a set of the prints in digital formats shall be sent to Historic England (Dr Helen Woodhouse) within 1 month of the completion of the works (or such other period as may be mutually agreed	Phase 1b	Contractor	SMC S00240209 (plant tracking) and associated documents (see Appendix 11 of the ECC Scope: document reference ENVRESW001353-CH2-XX-400-SO-Z-1084)	Not relevant to Phase 1a	N/A

Sowy and King's Sedgemoor Drain (KSD) Enhancements Scheme: Phase 1

Ref. No.	Objective	Action	Relevant phase	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
B43	Compliance with Ancient Monuments and Archaeological Areas Act (1979)	Equipment and machinery shall not be used or operated in the scheduled area in conditions or in a manner likely to result in damage to the monument or any ground disturbance.	Phase 1b	Contractor	SMC S00240209 (plant tracking) and associated documents (see Appendix 11 of the ECC Scope: document reference ENVRESW001353-CH2-XX-400-SO-Z-1084)	Not relevant to Phase 1a	N/A
B44	Compliance with Ancient Monuments and Archaeological Areas Act (1979)	All ground protection measures shall be removed from within the scheduled area within 2 weeks of the conclusion of each phase of works	Phase 1b	Contractor	SMC S00240209 (plant tracking) and associated documents (see Appendix 11 of the ECC Scope: document reference ENVRESW001353-CH2-XX-400-SO-Z-1084)	Not relevant to Phase 1a	N/A
B45	Compliance with Ancient Monuments and Archaeological Areas Act (1979)	Following removal of the ground protection measures from site the Environment Agency shall consult with Historic England in advance of taking any restorative steps for the grassland within the scheduled monument in accordance with the Landscape Management and Maintenance Plan submitted in support of the Environment Agency's Environmental Statement for the River Sowy & King's Sedgemoor Drain (KSD) Enhancements Scheme Phase 1.	Phase 1b	EA	SMC S00240209 (plant tracking) and associated documents (see Appendix 11 of the ECC Scope: document reference ENVRESW001353-CH2-XX-400-SO-Z-1084)	Not relevant to Phase 1a	N/A

Sowy and King's Sedgemoor Drain (KSD) Enhancements Scheme: Phase 1

Ref. No.	Objective	Action	Relevant phase	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
Resource and Waste Management							
No mitigation measures during construction have been identified for Resource and Waste Management.							
Population and Human Health							
B26	To minimise disruption to users of Public Rights of Way (PRoW)	<p>Inform local communities of the nature and duration of the works through signage and webpage updates.</p> <p>Ensuring local communities within the study area are kept informed about the proposed haulage routes through signage and webpage updates. Notices will also be required on PRoW immediately adjacent to the proposed haulage during the construction period to notify users of these PRoW.</p>	Phase 1a Phase 1b	Contractor			
B27	To minimise disruption to agricultural businesses	<p>Sign post any diversions to farm access routes required</p> <p>Provide access to drinking water for stock or implement alternative provisions</p>	Phase 1a Phase 1b	Contractor			
Landscape and Visual Amenity							
B28	To reduce the risk of damage to the wetland vegetation.	Temporarily re-locate and store marginal wetland vegetation which cannot be retained in appropriate conditions conducive to its continuing survival for re-placement once the WFD enhancement features have been completed.	Phase 1b	Contractor	LMP (drawing numbers: ENVRESW001353-CH2-XX-400-DR-EN-5425 to 5439)	Not relevant to Phase 1a	N/A
B29	To minimise any damage to the	Any damage to sward/vegetation at Sowy maintenance access route shall be	Phase 1b	Contractor	LMP (drawing numbers:	Not relevant to Phase	N/A

Sowy and King's Sedgemoor Drain (KSD) Enhancements Scheme: Phase 1

Ref. No.	Objective	Action	Relevant phase	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
	access route.	remediated as part of works			ENVRESW001353-CH2-XX-400-DR-EN-5425 to 5439)	1a	
B30	Minimise adverse impacts on landscape and visual amenity receptors	Reseeding of areas of bare ground created by vehicle access, bank raising and reprofiling works on the KSD using a bespoke neutral wet grassland (NWG) mix or other appropriate seed mix following pre-seeding preparatory works (weed control and cultivation).	Phase 1b	Contractor	LMP (drawing numbers: ENVRESW001353-CH2-XX-400-DR-EN-5425 to 5439)	Not relevant to Phase 1a	N/A
B31	Minimise adverse impacts on landscape and visual amenity receptors	Reseeding of areas of bare ground created by vehicle access, bank raising and reprofiling works on the Sowy using a bespoke NWG mix or other appropriate seed mix following pre-seeding preparatory works (weed control and cultivation).	Phase 1b	Contractor	LMP (drawing numbers: ENVRESW001353-CH2-XX-400-DR-EN-5425 to 5439)	Not relevant to Phase 1a	N/A
B32	Minimise adverse impacts on landscape and visual amenity receptors	Reseeding of any newly created channel bank (through creation of embayments, two-stage channels and backwater) and any maintenance access routes with a bespoke NWG mix or other appropriate seed mix agreed with NE following pre-seeding preparatory works (weed control and cultivation).	Phase 1b	Contractor	LMP (drawing numbers: ENVRESW001353-CH2-XX-400-DR-EN-5425 to 5439)	Not relevant to Phase 1a	N/A
B33	Minimise adverse impacts on landscape and visual amenity	Newly created marginal shelves on the embayments and two-stage channels and the backwater channel will be planted with appropriate marginal wetland species	Phase 1b	Contractor	LMP (drawing numbers: ENVRESW001353-CH2-XX-400-DR-EN-	Not relevant to Phase 1a	N/A

Sowy and King's Sedgemoor Drain (KSD) Enhancements Scheme: Phase 1

Ref. No.	Objective	Action	Relevant phase	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
	receptors	<p>introduced by installing:</p> <ul style="list-style-type: none"> • Pre-vegetated coir rolls along the riverside edge of the marginal shelves or edges of the backwater channel • Pre-vegetated coir pallets closer to the landward edge of the marginal shelves • Pre-planting any marginal plants lifted from the channel edges at WFD enhancement locations prior to excavation and stored on site in suitable locations <p>Backwater islands will be planted with appropriate wet scrub species (grey willow, goat willow, osier, downy birch, dog rose, elder, hawthorn and bramble) to provide biodiversity habitat value for a range of species and to assist provide long-term stabilisation of the banks.</p>			5425 to 5439)		
B34	Minimise adverse impacts on landscape and visual amenity receptors	Implement measures under site specific Arboricultural Method Statement (SS AMS) as relevant to the working area for each Phase	Phase 1a Phase 1b	Contractor	AMS: ENVRESW001353-CH2-XX-400-MS-EN-1120		
B35	Minimise adverse impacts on landscape and visual amenity receptors	Mark up Root Protection Areas (RPAs) in working areas and areas where heavy plant tracking in excess of baseline frequency for any trees not included within the SS AMS and install tree protection barriers as	Phase 1a Phase 1b	Contractor			

Sowy and King's Sedgemoor Drain (KSD) Enhancements Scheme: Phase 1

Ref. No.	Objective	Action	Relevant phase	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
		advised by the ECoW. Avoid tracking within these areas where practicable. Where not practicable, install appropriate ground protective measures as advised by a suitably qualified arboriculturalist.					
Noise							
B36	To minimise the potential for disturbance.	Ensure Best Practical Means (BPM), including noise shrouding and plant specification and maintenance, will be applied throughout the construction period.	Phase 1a Phase 1b	Contractor			
B37	To minimise the potential for noise disturbance to sensitive receptors located near haulage routes and access points	Implement measures including: 1. Minimise the use of rapid breaking or accelerating 2. Avoid the use of horns, unless required for safety reasons on narrow tracks 3. Brief drivers on the existing quiet nature of the areas surrounding haul routes and the need to minimise noise generated through haulage • Inform residents of Church Path, Church Drove, Aller Drove and Coombe Lane regarding the nature of vehicles passing, timescales and durations of the works	Phase 1a (measures 1-3) Phase 1b (all measures)	Contractor			
Climate							
B38	Minimise impact on CO ₂ emissions	Maintain carbon calculator for the Scheme	Phase 1a	Contractor			

Sowy and King's Sedgemoor Drain (KSD) Enhancements Scheme: Phase 1

Ref. No.	Objective	Action	Relevant phase	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
	during construction		Phase 1b				
B39	Minimise impact on CO ₂ emissions during construction	Implementing the following targets as part of the works: <ul style="list-style-type: none"> Avoiding the use of inefficient or oversize machinery to complete the works No idling of vehicles Use of new plant where necessary Reduction of the overordering of material to reduce waste onsite 	Phase 1a Phase 1b	Contractor			
Traffic							
B41	To minimise the impact from construction vehicles on traffic and minimise risks to archaeological remains and deposits	Store construction plant in a site compound or on site overnight to reduce the movements to and from site and within the site boundary	Phase 1a Phase 1b	Contractor			
C. Post construction							
Water							
C1	To reduce the risk of adverse water quality from maintenance activities	Monitor the oxygen levels using a dissolved oxygen monitor and stop maintenance works should they approach trigger levels.	Phase 1b	Contractor		Not relevant to Phase 1a	N/A
C2	To minimise risks to	Carry out erosion control planting as per	Phase 1b	Contractor	LMP (drawing numbers:	Not relevant to Phase	N/A

Sowy and King's Sedgemoor Drain (KSD) Enhancements Scheme: Phase 1

Ref. No.	Objective	Action	Relevant phase	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
	water quality.	landscape drawings.			ENVRESW001353-CH2-XX-400-DR-EN-5425 to 5439)	1a	
C3	To ensure successful establishment of landscaping planting proposals	Post-construction monitoring and maintenance, supervised by LCoW	Phase 1b	Contractor, following advice from LCoW (client provided)	LMP (drawing numbers: ENVRESW001353-CH2-XX-400-DR-EN-5425 to 5439)	Not relevant to Phase 1a	N/A
Flora and Fauna							
C4	Comply with requirements of EA organisational licence for water vole displacement	Post-construction monitoring as required under organisational licence	Phase 1b	EA		Not relevant to Phase 1a	N/A
C5	To reduce the loss of suitable foraging and roosting habitat wintering bird features of designated sites and minimise adverse effects on agricultural land holdings	Implement measures identified in River Sowy and King's Sedgemoor Drain Enhancement Scheme Mitigation Action Plan (MAP) Version 5 as provided in Appendix J of the ES for the Scheme and Appendix A of this document.	Phase 1b	EA NE SDBC (individual measures as indicated with MAP, Appendix A)	ES (document reference: ENVRESW001353-CH2-XX-400-RP-EN-1042)	Not relevant to Phase 1a	N/A
Cultural Heritage							

Sowy and King's Sedgemoor Drain (KSD) Enhancements Scheme: Phase 1

Ref. No.	Objective	Action	Relevant phase	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
		None identified					
Resource and Waste Management							
None identified							
Population and Human Health							
C6	To minimise adverse effects on agricultural land holdings	Ensure effective liaison with agricultural businesses to discuss mitigation measures agreed with NE regarding environmental stewardship agreements and any potential financial compensation for landowners	Phase 1a Phase 1b	EA			
Landscape and Visual Amenity							
C7	To minimise effects on the landscape and visual amenity	Monitoring and maintenance of landscape planting in accordance with the LMMP	Phase 1b	EA (following completion of initial maintenance period as identified in LMMP) Contractor (for initial maintenance period as identified in LMMP) LCoW (client provided) (for initial maintenance period as	LMMP (Document reference: ENVRESW001353-CH2-ZZ-400-PL-EN-1096)	Not relevant to Phase 1a	N/A

Sowy and King's Sedgemoor Drain (KSD) Enhancements Scheme: Phase 1

Ref. No.	Objective	Action	Relevant phase	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
				identified in LMMP)			
Noise							
None identified							
Air Quality							
None identified							
Climate							
None identified							
Traffic							
None identified							

Environmental audit record

Project		Project ref.:	
Project Manager:		NEAS EPM:	
Location		Grid reference	

Site Visit Audit Details

Visit During/Post Construction:		Date of Visit:		Time of Visit:	
Audit Officer:		Photos taken (y/n):		Referenced to Pre-Photos(y/n):	

Does the Site Supervisor have an up to date copy of the EAP? Yes / No

General comments

Appendix A

River Sowy and King's Sedgemoor Drain Enhancements Scheme

Parrett Dredging and River Sowy and King's Sedgemoor Drain Enhancements Scheme Mitigation Plan

Version 5: update to IDB Mitigation Plan for Parrett Dredge (Version 3: published in IDB Environmental Statement) to also include River Sowy and King's Sedgemoor Drain Enhancements Scheme (hereon referred to as Sowy projects for ease) effects (Table B & Maps 3 & 4) and incorporate an Implementation plan (Table 3) for mitigation actions for both projects. Version 4 used for comment to update in version 3

Tables 3 & 4 and Maps 3 & 4 are included in Annex 1.

Version 1- 4 10/6/2020 Philip Brewin Parrett IDB	Version 5 22/06/2020 John Rowlands Environment Agency
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1. Introduction

The Somerset Levels and Moors provides exceptional wetland habitat for 10,000s of over-wintering wildfowl and waders (waterbirds). The availability and quality of this habitat depends on effective water level management. The conservation requirements for water level management include maintenance of extensive wet grasslands with wet ditches and large areas of splash flooding in the winter months of December, January and February. For the Parrett Dredging and Sowy projects to be legally compliant, the work must not cause a deterioration in these conditions.

The primary purpose of this mitigation plan is to ensure no deterioration in SPA habitat availability or quality, as a consequence of the Dredging and Sowy projects. It is important to highlight that this plan covers the effects of a full River Sowy and KSD Enhancements scheme (increasing capacity up to 24 cubic metres of water - cumecs) and an IDB dredge project which was planned to increase conveyance by 8 cumecs. The impact of both these projects will initially be less than shown by the modelling outputs within this plan. The Phase 1 Sowy projects will deliver a 17 cumec capacity and the dredge a 3- 4 cumec increase. This plan will allow any future phases of work to have agreed mitigation in place and therefore be legally compliant. It was agreed by all partners that this strategic and phased plan would be the best approach to take in delivering such a large project.

This change will be most apparent for the Langport Moors and the Sowy/KSD corridor. Small winter floods, resulting from minor overtopping of spillways or simply from rainfall and runoff overwhelming watercourses on the Moors, are beneficial to waterbirds. Especially important is their dynamic nature and the consequential fluctuations in water levels that result in the short-term wetting up of low-lying meadows. Another important

aspect is how the projects affect areas of suitable habitat beyond the boundaries of the protected sites. These areas provide supporting habitat (functionally linked land) and are typically wet grassland meadows with few trees that provide feeding opportunities (areas of splash flooding) in wet conditions and are important refuges during larger floods, when waterbirds are displaced from the lower, wetter, sites by deep floods. Hydraulic modelling indicates the projects will, in effect, reduce the magnitude, and therefore the frequency, of small winter floods.

2. Mitigation Objectives

Over the last 30 years, an extensive network of Raised Water Level Areas (RWLA) has been developed and operated across many of the moors. Water levels are maintained close to ground level in these wetland schemes to create surface water conditions in winter months, which are used by waterbirds as night-time feeding sites or daytime safe roost sites. RWLAs are the primary mechanism for achieving the conservation objectives of the SPA. The total area of land under RWLA management in the Parrett catchment is 2,000ha. These areas help mitigate the effects of flood and water management, which generally reduce the wetness of the low-lying meadows in winter and therefore prevent the habitat requirements of the SPA from being met. RWLAs will also act to protect the SPA from the potential impacts of the Dredging and Sowy projects on small winter floods. It is essential that this mitigation plan supports the ongoing maintenance and operation of the existing RWLA network.

This mitigation plan proposes to sustain the existing area of RWLA, recognising that investment will be required for renewal, operation and maintenance of these schemes. If the total area was to fall below current levels, then the mitigation plan will seek to replace the lost area with an equivalent area elsewhere. This is a basic requirement for ensuring that there is no deterioration in SPA habitat availability or quality, and that the SPA retains its favourable status.

The existing Water Level Management Plans (WLMPs) will be complied with and the WLMPs will be reviewed and updated to take account of infrastructure improvements and operational changes and ensure favourable conditions are sustained.

This mitigation plan also includes actions for each Moor to ensure no change to the impact of the Dredging and Sowy projects on the extent, duration and frequency of small winter floods outside of RLWAs. As hydraulic modelling indicates the majority of change will occur outside of protected areas, these actions should focus on the functionally linked land (outside designated areas). Mitigation actions include changing target water levels in winter, to ensure ditches remain wet and surface water features are created during wet conditions.

Alternative options for mitigation have also been identified, including the potential to develop new RWLAs, on functionally linked land. Similar mitigation actions can also be undertaken within designated sites, where there is potential to

extend/consolidate existing wetland schemes or generally improve water level management. Mitigation actions will take into account the broader conservation objectives for each area, including condition status and any remedial actions required to achieve favourable condition.

3. Impacts

The impacts of the Dredging and Sowy projects on the duration and extent of small, environmentally beneficial, winter floods have been identified through hydraulic modelling and mapping. This is summarised in Figures D3.1 and D3.2, which were included in the HRA Appropriate Assessments (see text box below). Table D3.1 further summarises the model output for each area.

Extract from HRA Appropriate Assessment: Summary of hydraulic modelling of the potential impact of the Dredging and Sowy projects on the duration and extent of small, environmentally beneficial, winter floods.

A hydrological modelling study compiled by SDBC has been used to inform this HRA (Appendix 1). The EA hydraulic flood model for the lower Parrett and Tone was used to assess the potential effects of conveyance improvements. Light Detecting and Ranging (LiDAR) land level data were used to calculate the area of land which the model indicated would have at least 50 mm depth of water (splash conditions) at the peak flood level of model runs for the 2012 summer floods. The 2012 summer floods are considered to be a suitable reference event for winter floods that have an estimated probability in occurrence (i.e. a 1 in 3 year to a 1 in 5 year flood event).

The modeling includes the following caveats and assumptions:

The model is calibrated to analyse large flood flows and not changes in more frequent small flood events which are the focus of the study to inform the HRA;

The model uses reference flow events, rather than flows of known probability;

The model does not include the ditch networks or water level management infrastructure; and

Modelling includes the length of the River Parrett from Oath to Burrowbridge which is approximately 50% more than the actual length of proposed dredging from Stathe to Burrowbridge, therefore the actual increase in conveyance will be less.

The model has used the full Sowy scheme outputs (24 cumecs) but with a phase 1 scheme (17 cumecs) being promoted, the impacts will be less than modelled and shown here.

The model has predicted changes to the level and duration of winter surface splash flooding in the following areas outlined in Table D3.1 as a result of the dredging of the River Parrett. The results of the hydrological modelling are also presented in Figures D3.1 and D3.2.

Using the 2012 summer floods as a proxy for a small winter flood, hydraulic modelling of current baseline conditions indicates a total flood area across all Parrett Moors of nearly 3,500 ha. This reduces by nearly 300 ha as a result of the Parrett dredging in the model. Across all moors there is an approximate 7% reduction in flood area. Changes in flood extent are greatest (70%) outside the areas of SSSI (200 ha) and 80% is outside of Raised Water Level Areas (RWLAs) (230 ha). It must be noted that the reductions will in fact be smaller initially for the proposed project dredging and Sowy projects, as the dredging is approximately 50% of the modelled scheme and the improved conveyance for the Phase 1 Sowy projects is less than the full scheme improvements.

Langport Moors, West Sedgemoor, Aller Moor, King's Sedgemoor and Chedzoy experience the greatest change in flood extent and have a predicted minimum 10% reduction in flooding. Reductions in flood duration are relatively small: typically, a 12-hour to a 2-day reduction in flooding due to increased flood flow conveyance of the River Parrett.

RWLAs considerably contribute to achieving and sustaining wetland condition of the SPA and maintain the required conditions during December to February. It is possible to compare RWLA to the effect of dredging in terms of area and duration: ha/days (the length time flooded multiplied by area). Assuming 50% the area within RWLAs achieves the required winter conditions, RWLAs contribute 167,300 ha/days, which compares with a reduction of 1500 ha/days for a typical winter flood as a consequence of the proposed Parrett Dredge. This represents a 1% reduction in SPA winter flood conditions due to dredging, when compared to the combined contribution of RWLAs. The potential effect associated with water level management upon the Somerset Levels and Moors SPA and Ramsar site is predicted to be minor adverse.

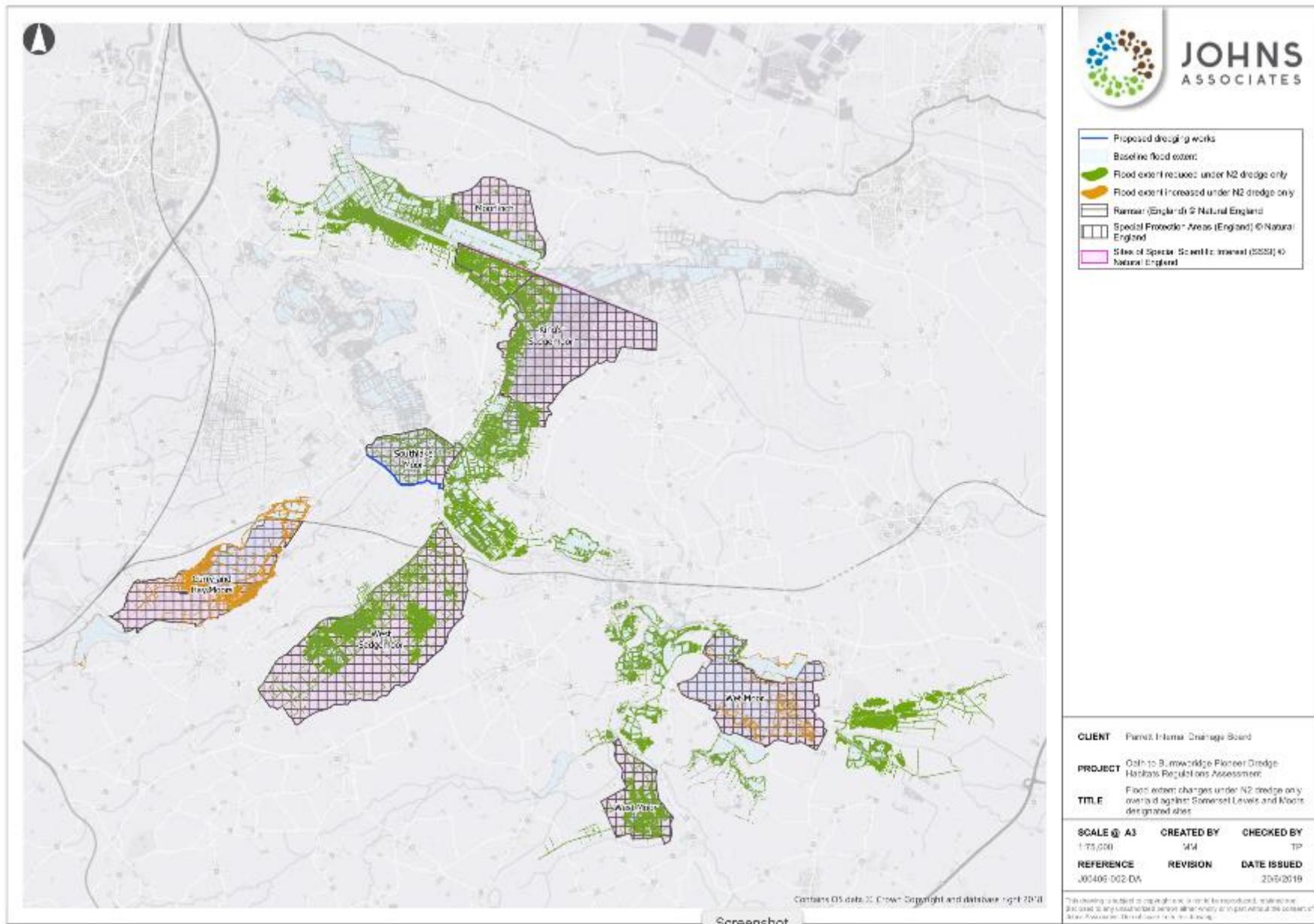


Figure D3.1 (from HRA and Appropriate Assessment): Analysis of Indicative Changes in Flood Extent for the Parrett Dredge

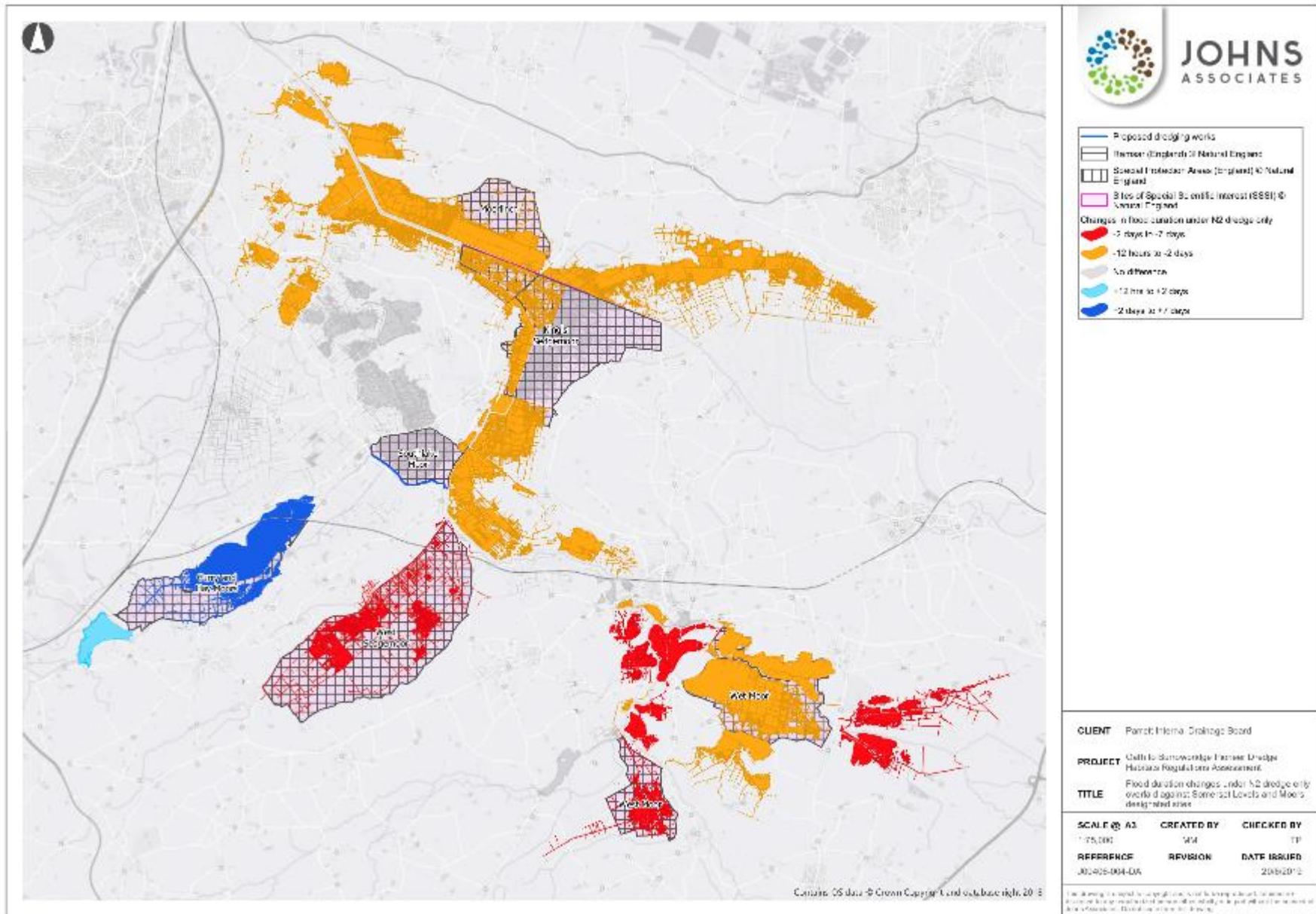


Figure D3.2 (from HRA and Appropriate Assessment): Analysis of Indicative Changes in Flood Duration for the Parrett Dredge

Table D3.1 - Indicative change in flood extent and duration for the Parrett Dredge

Hydraulic modelling was used to identify potential changes in the level and duration of flooding, for a small winter flood, as a consequence of the Parrett Dredge. Table D3.1.

Area	Change (ha)	Change within SSSI	Change outside SSSI	Change within RWLAs	Change outside RWLAs	Change in flood duration
Long Load	-69.4	0	-69.4	0	-69.4	-2 days to -7 days
Wet Moor	-29.7	0.3	-30	1.21	-31.09	6 Areas: -12 hrs to -2 days 4 Areas: -2 days to -7 days
West Moor	-22	-21.8	-0.2	-12.78	-9.22	-2 days to -7 days
South Moor	-2.2	0	-2.2	0	-2.2	1 Area -2 days to -7 days 1 Area: -12 hrs to -2 days 3 Areas: No difference
Huish Level	-4.9	0	-4.9	0	-4.9	-2 days to -7 days
Langport Moors	-0.9	0	-0.9	0	-0.9	1 Area: -12 hrs to -2 days 1 Area: No difference
West Sedgemoor	-58.5	-57.7	-0.8	-36.42	-22.08	2 Areas: No difference 1 Area: -2 days to -7 days
Stanmoor	0	0	0	0	0	No difference
Currymoor	59	43.5	15.5	2.41	56.59	1 Area +12 hrs to +2 days 2 Areas: +2 days to +7 days

Area	Change (ha)	Change within SSSI	Change outside SSSI	Change within RWLAs	Change outside RWLAs	Change in flood duration
Northmoor	0	0	0	0	0	No difference
Aller Moor	-65.2	-6.1	-59.1	-6.24	-58.96	7 Areas: -12 hrs to -2 days
						1 Area: No difference
King's Sedgemoor (SSSI)	-39.3	-35.9	-3.4	-1.05	-38.25	4 Areas: -12 hrs to -2 days
						1 Area: No difference
King's Sedgemoor (Butleigh & Walton)	0	0	0	0	0	No difference
Moorlinch	-7	-2	-5	-3.65	-3.35	-12 hrs to -2 days
Southlake	-1.8	-1.7	-0.1	-1.78	-0.02	No difference
Earlake	0	0	0	0	0	No difference
Langmead & Weston	0	0	0	0	0	No difference
Chedzoy	-47.2	0	-47.2	0	-47.2	-12 hrs to -2 days
Bawdrip & Bradney	0	0	0	0	0	No difference
TOTAL	-289	-81	-208	-58	-231	

4. Mitigation Action Plan

Based on the impacts identified from the modelling, mitigation options have been attributed to each area and developed into actions, through consultation with EA, NE and PIDB.

The following Table 1 “General Water Management Mitigation Measures” identifies mitigation actions that are applicable to all areas. Site specific and detailed actions are included in section 5 and Table 2 “Site Specific Water Management Mitigation Measures”

Following implementation of the mitigation measures identified in Table 2, the proposed Dredging and Sowy projects are unlikely to have a significant effect on the Somerset Levels and Moors SPA.

Table 1. General Water Level Management Mitigation Measures: These actions apply to all areas. Site specific actions are identified in Table 2 below.

General actions	Description	Type	Responsible Body	When	Actions
All areas	Ensure water level management (especially in winter) meets the operational requirements (target water levels) of the agreed WLMPs. Report annually on status of WLMP implementation.	WLMP compliance	IDB/EA	ongoing	All WLMPs for the Parrett area are nearly 10 years old and need updating to take account of investments and operational changes since the plans were last produced. WLMPs will be the primary documents for ensuring protected sites achieve and sustain favourable condition status and to implement mitigation actions for Parrett Dredging and the Sowy.
All areas	Maintain and update WLMPs, extend WLMPs to include Functionally Linked Land (FLL) here necessary. Report annually on status of WLMP development outside of SSSIs.	WLMP update	IDB	Autumn 2020	Areas impacted by Dredging and Sowy projects, where current WLMPs do not include winter penning levels for nature conservation including: Aller Moor, Chedzoy and Kings Sedgemoor.
All areas	Sustain existing RWLA network. Maintain existing schemes, seek opportunities to improve the operation, or extend existing schemes. Implement new areas if existing schemes fall out of operation. Report annually on status of RWLA network.	RWLAs	IDB/EA	Ongoing	Significant investment has been made in recent years to improve RWLA management. Existing RWLAs that are currently failing to meet this requirement include West Moor and Moorlinch.
All areas	Maintain and improve existing water management infrastructure required to achieve the conservation objectives of the protected sites and the wider area (FLL). Report annually on status of water management infrastructure.	Water management infrastructure	IDB/EA	Ongoing	Significant investment has been made in recent years to improve water management infrastructure. Notable areas, where further investment is required, include: King's Sedgemoor and West Moor.
All areas	Channel maintenance. Ensure channel maintenance is sympathetic to nature conservation. In particular, ensure maintenance is undertaken at the most appropriate time of year and in accordance with agreed specifications. Report annually on maintenance programme.	Operations (channel maintenance)	IDB/EA/farmers (supported by agri-environment funding)	Spring 2020	Parrett IDB will review maintenance programmes before the end of 2019 and will agree maintenance specifications and timings with NE.

General actions	Description	Type	Responsible Body	When	Actions
Within SSSIs See Table 2 (below) for details	Mitigate for the predicted changes in small winter floods as a consequence of Dredging and the Sowy projects. Modelling indicates that the combined impact of these schemes across all Parrett wetland SSSIs is 100ha less of splash flooding, with duration of flooding typically reduced, by 2 days, to one week for a flood of the same magnitude as the summer 2012 flood. No assessment of the impacts on flood frequency could be made, but it can be assumed that Dredging and the Sowy projects will reduce the frequency of small floods in winter. Report annually on this requirement.	Strategic planning and operational delivery. Structures and operations (water levels).	IDB/EA	Spring 2020	See site specific actions (Table 2) for a list of potential measures that can, in combination, meet this requirement. Not all actions identified in Table 2 will be practical and achievable. Given potential uncertainties over the achievability of some actions, more actions have been identified than will be required for mitigation. The minimum requirement is to mitigate for reduced winter flooding on 100ha SSSI land.
Outside SSSIs See Table 2 (below) for details	Mitigate for the predicted changes in small winter floods as a consequence of Dredging and the Sowy projects. Modelling indicates that the combined impact of these schemes across all non-designated areas of the Parrett is 500ha less of splash flooding, with duration of flooding typically reduced, by 2 days, to one week for a flood of the same magnitude as the summer 2012 flood. No assessment of the impacts on flood frequency could be made, but it can be assumed that Dredging and the Sowy projects will reduce the frequency of small floods in winter. Report annually on this requirement.	Strategic planning and operational delivery. Structures and operations (water levels).	IDB/EA	Spring 2020	See site specific actions (Table 2) for a list of potential measures that can, in combination, meet this requirement. Not all actions identified in Table 2 will be practical and achievable. Given potential uncertainties over the achievability of some actions, more actions have been identified than will be required for mitigation. The minimum requirement is to mitigate for reduced winter flooding on 500ha of non-designated land.

5. Site Specific Mitigation Actions

5.1. Monitoring of effects

- 5.1.1. Ecological monitoring** – The primary source of ecological data, relating to the SPA, is bird count data from the British Trust for Ornithology (BTO). BTO data will be collected by Natural England and analysed once a year to identify any changes in the number of birds using the SPA. This data will help identify ecological change that may require mitigation.
- 5.1.2. Water level monitoring** – Where detrimental change is likely as a consequence of the Dredging or Sowy projects, continuous water level data will be collected by the Environment Agency at key locations for each moor and analysed once a year for any discernible trends that might be attributed to the Dredging or Sowy projects. Historical water level records will be used to identify trends in data collected after the Dredging and Sowy projects have been implemented. If necessary, new telemetry will be installed to monitor conditions in specific locations. Data analysis will focus on identifying changes in the frequency and duration of small winter floods. If detrimental trends in water levels are detected, further meteorological and climate data such as rainfall and temperature will be analysed in order to better understand the causes of those trends.

5.2. Mitigation measures including Water Level Management Mitigation Measures

Where detrimental change, as a consequence of the Dredging or Sowy projects, has been identified and confirmed by monitoring, appropriate mitigation measures will be deployed. Mitigation measures will be agreed with the partners (Natural England, IDB and EA) prior to implementation.

- 5.2.1. Replacement or new water control structures** – Replace failing structures, or build new structures, that are necessary to effect ‘no change’ to existing surface water conditions during winter months (December to February) and ensure no detrimental change in SPA condition as a consequence of the Dredging and Sowy projects.
- 5.2.2. Operational protocols** – Where monitoring indicates it is necessary, and it is agreed that other measures are less suitable, existing water level control structures such as pumping stations and sluices can be operated to effect ‘no change’ to existing conditions during winter months (December to February) and ensure no detrimental change as a consequence of the Dredging and Sowy projects. This could be achieved by evacuating excess flood water in accordance with existing protocols but suspending evacuation for a short period of time once an agreed level is achieved to safeguard the ‘splash conditions’ that would

otherwise be lost. If required, these changes will only be implemented during small winter floods that pose no increased flood risk to homes, businesses and infrastructure (e.g. local roads). And the operational risk for each location will need to be carefully considered and the agreed protocols incorporated into the Water Level Management Plan for each area.

- 5.2.3. Water Level Management Plan (WLMP)** – Water Level Management Plans will be reviewed with partner organisations by 2022. Changes to water control structures and water levels, agreed in the intervening period, will be incorporated in WLMPs.
- 5.2.4. Maintain a depth of water (minimum of 300mm) in ditches through the winter period** – This will include the ditch network within and outside the designated sites where ditches have sufficient depth to achieve this without increasing flood risk.
- 5.2.5. Creation of in-field wet features** – To maintain surface water conditions for waterbirds in winter, such as creation of shallow water scrapes and wet field gutters.

Table 2. Site specific Water Level Management Mitigation Measures: the current condition status of Parrett SSSIs, and existing remedial actions required for each site to achieve favourable condition status, have been used to inform selection of mitigation measures required to effect ‘no change’ to existing surface water conditions during winter months (December to February) and ensure no detrimental change in SPA condition as a consequence of the Dredging and Sowy projects. Refer to Table D3.1 (above): for potential size and probably location of effect.

Area	Description	Mitigation type	Responsible Body	When	Actions
Aller Moor	Monitor surface water conditions in winter, new telemetry required for Aller Moor, upstream of Aller Drove.	Monitoring	IDB/EA	Report annually	Implement operational changes to effect ‘no change’ in winter months. Informed by monitoring.
	Remedial Work at Beer Wall to prevent water bypassing structure during high flows.	Rebuild structures	EA	Completed 2019	Part of Sowy project, but not mitigation, due to defect causing unanticipated changes in surface water conditions on Aller Moor in winter.
	Implement changes in the operation of Langacre and Beer Wall or IDB structures on Aller Moor	Operational Protocols	EA/IDB	Winter 2020/21	Implement operational changes to effect ‘no change’ in winter months. Informed by monitoring. Use EA structures Church Drove, Oxleaze Drove and IDB structure Stathe Drove to pen winter level. Operate IDB weirs Lucas Rhyne, Black Withies and Leazeway to maintain water levels in winter.
King Sedgemoor (Non SSSI) Butleigh and Walton Moor, 18 ft rhyne	Monitor surface water conditions in winter, new telemetry required for Butleigh and Walton Moor, 18 ft rhyne.	Monitoring	IDB/EA	Report annually	Implement operational changes to effect ‘no change’ in winter months. Informed by monitoring.
	Update WLMP.	WLMP	IDB	2022	To agree and formalise target water levels and operational protocols.
	Land purchase to create new RWLA.	New structures	IDB/NE	2025	Potential to mitigate changes in surface water conditions in winter.

Area	Description	Mitigation type	Responsible Body	When	Actions
	Monitor water levels using telemetry at Greylake and Nythe structure.	Monitoring	IDB	2020 – 2022	Operate to effect 'no change' in winter months. Informed by monitoring.
	Implement changes in the operation of Greylake sluice, or other alternative.	Operating protocols	IDB	2022	If required and feasible, as informed by monitoring.
West Sedgemoor	Monitor surface water conditions in winter.	Monitoring	IDB/EA	Report annually	Implement operational changes to effect 'no change' in winter months. Informed by monitoring.
	Update WLMP.	WLMP	IDB	2022	To agree and formalise target water levels and operational protocols.
Long Load	Monitor surface water conditions in winter.	Monitoring	IDB/EA	Report annually	Area has low SPA potential due to disturbance and flood risk management constraints.
	Implement changes in the operation of Long Load pumping station and siphon.	Operational protocols	EA	2021	Operate to effect 'no change' in winter months. Only if effect seen through monitoring?
	Prepare WLMP (no existing WLMP for this area).	WLMP	IDB	2025	To agree and formalise target water levels and operational protocols. Area has low SPA potential due to land use and disturbance constraints.
Wet Moor SSSI	Monitor surface water conditions in winter.	Monitoring	IDB/EA	Report annually	Implement operational changes to effect 'no change' in winter months. Informed by monitoring.
	Implement changes in the operation of North barrier Sluice to sustain surface water conditions in winter.	Operational protocols	EA	2021	Operate to effect 'no change' in winter months. Informed by monitoring.
	Update WLMP.	WLMP	IDB	2022	To agree and formalise target water levels and operational protocols.

Area	Description	Mitigation type	Responsible Body	When	Actions
West Moor	Monitor surface water conditions in winter.	Monitoring	IDB/EA	Report annually	Implement operational changes to effect 'no change' in winter months. Informed by monitoring.
	Rebuild and maintain existing RWLA including syphons, bunds and flap valves.	Refurbishment / Rebuild structures	EA construction IDB maintenance and operation	2020/21	Refurbish 68 structures in total (works varying from replacing fences to replacement of trench sheet dams) Possibility to extend the RWLA, re resilient wet grassland project.
	Update WLMP.	WLMP	IDB	2022	To agree and formalise target water levels and operational protocols.
Huish Level	Monitor surface water conditions in winter.	Monitoring	IDB/EA	Report annually	Area has low SPA potential due to disturbance and flood risk management constraints.
	Prepare WLMP (no existing WLMP for this area).	WLMP	IDB	2025	To agree and formalise target water levels and operational protocols. Area has low SPA potential due to disturbance and flood risk management constraints.
Moorlinch	Monitor surface water conditions in winter.	Monitoring	IDB/EA	Report annually	Implement operational changes to effect 'no change' in winter months. Informed by monitoring.
	Rebuild and maintain existing RWLA, including bunds and flap valves, and consider extension to the east.	Refurbishment / Rebuild structures and operational changes	EA construction IDB maintenance and operation	2020/21	Refurbish 28 structures in total (works varying from replacing fences to refurbishment of existing structures) Restoration of neglected ditch habitats (low water depth and very poor water circulation through SSSI ditches) is impacting habitat quality and water level management.
	Implement changes in the operation of IDB weirs to extend existing RWLA to the east.	Operational changes	IDB	2021	Operate to effect 'no change' in winter months. Informed by monitoring.

Area	Description	Mitigation type	Responsible Body	When	Actions
	Update WLMP.	WLMP	IDB	2022	To agree and formalise target water levels and operational protocols.
King Sedgemoor (SSSI)	Monitor surface water conditions in winter.	Monitoring	IDB/EA	Report annually	Implement operational changes to effect 'no change' in winter months. Informed by monitoring.
	Rebuild Egypt Clyse.	Rebuild structures	Rebuild structures	2020/21	Refurbishment of upstream headwall and discharge culvert. Maintain current operational practices (closed in winter).
	Maintain existing RWLA.	Rebuild structures	IDB	2020	Extreme high silt levels in SSSI ditches and rhynes have compromised the summer feed to KSM and is impacting SSSI condition. Bunds and fencing need repair and maintenance.
	Update WLMP.	WLMP	IDB	2022	To agree and formalise target water levels and operational protocols.
Currymoor	Monitor surface water conditions in winter.	Monitoring	EA	Continuation of existing EA mitigation programme	Monitor surface water conditions in winter
	Update WLMP.	WLMP	IDB	2022	To agree and formalise target water levels and operational protocols.
Southlake Moor	Monitor surface water conditions in winter.	Monitoring	IDB/EA	Report annually	Implement operational changes to effect 'no change' in winter months. Informed by monitoring.
	Update WLMP.	WLMP	IDB	2022	To agree and formalise target water levels and operational protocols.
Chedzoy	Monitor surface water conditions in winter.	Monitoring	IDB/EA	Report annually	Implement operational changes to effect 'no change' in winter months. Informed by monitoring.

Area	Description	Mitigation type	Responsible Body	When	Actions
	Update WLMP.	WLMP	IDB	2022	To agree and formalise target water levels and operational protocols.

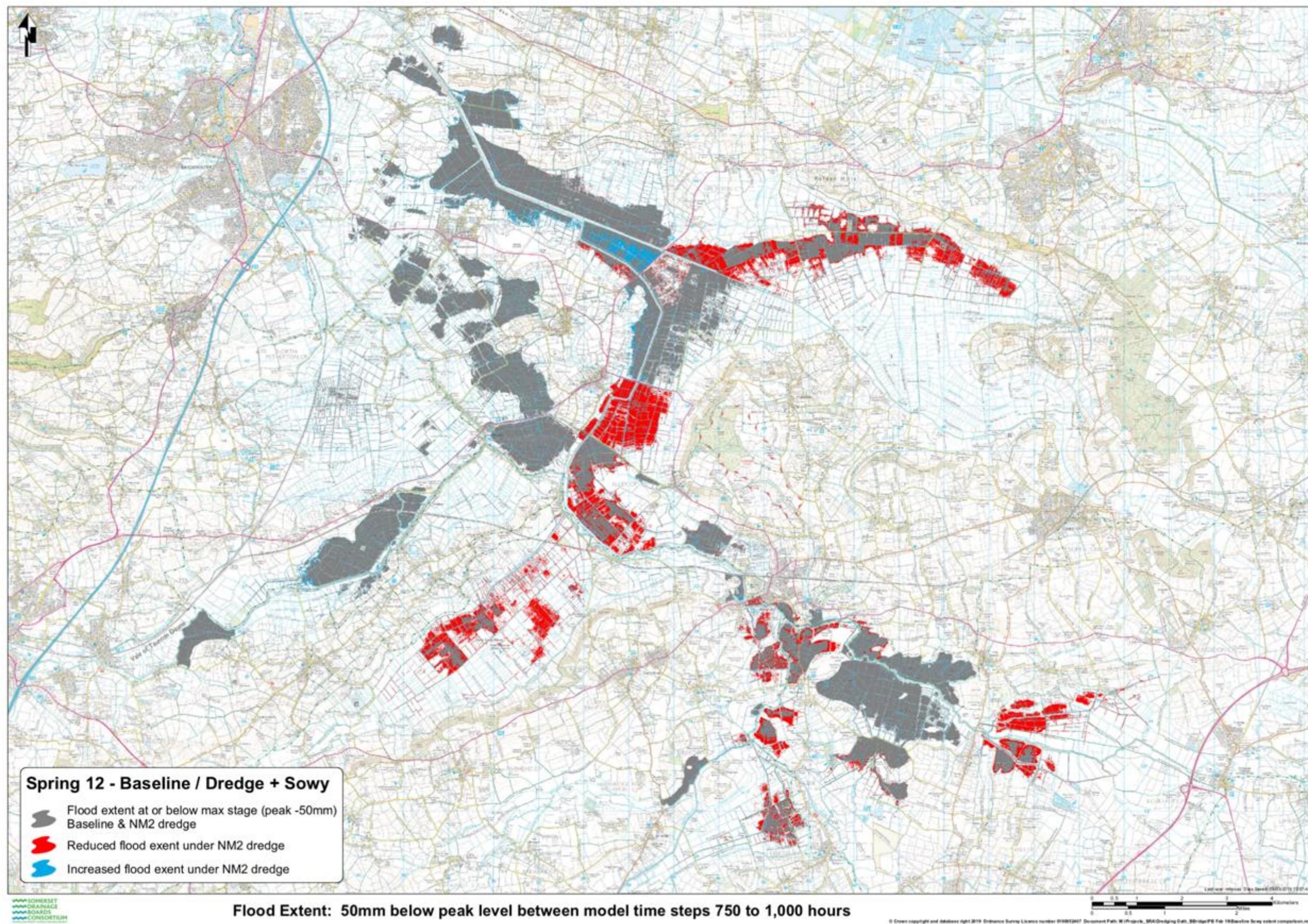
ANNEX 1

Table 3: Indicative change in flood extent and duration for the Parrett Dredge and Sowy Project combined

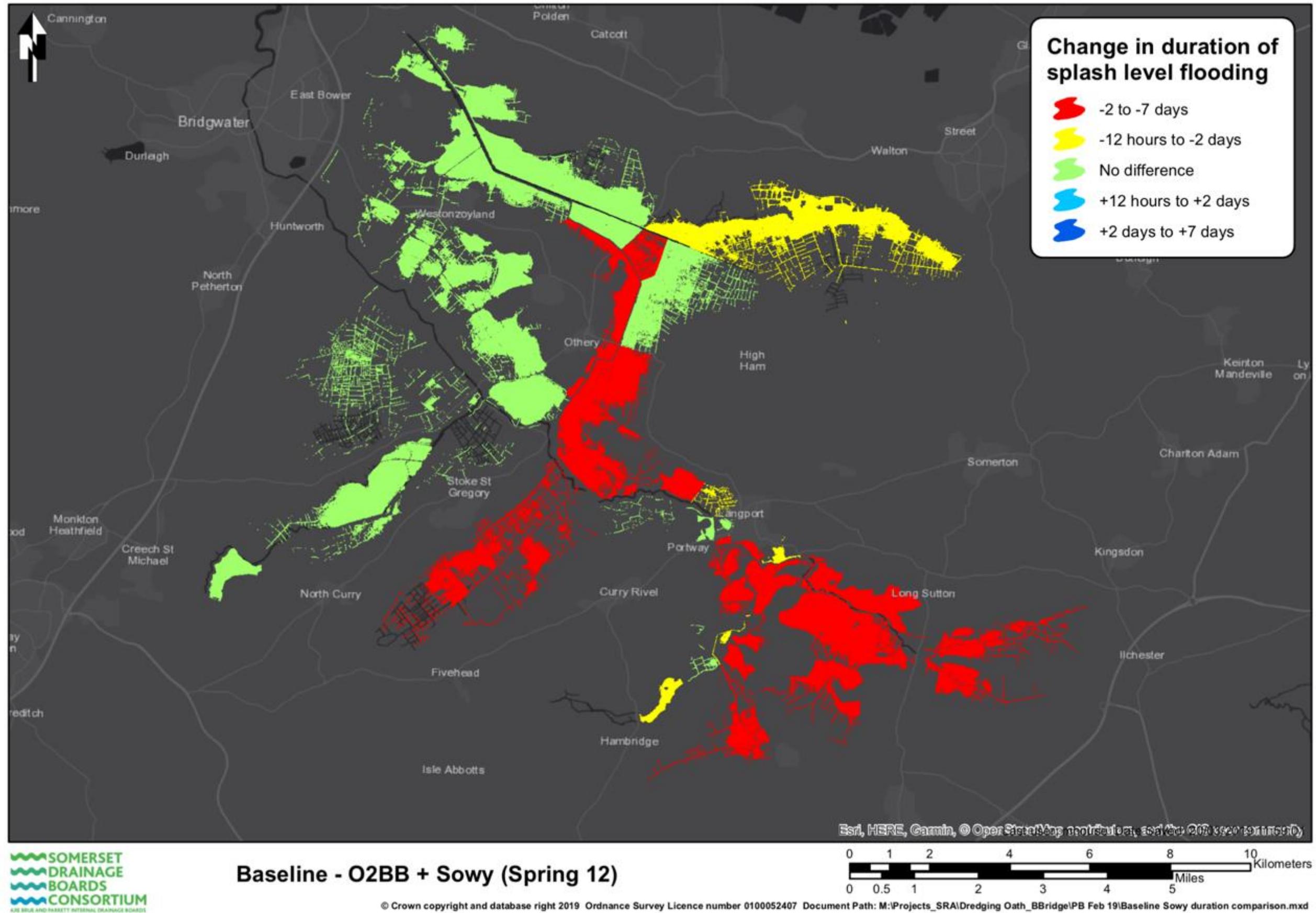
Hydraulic modelling was used to identify potential changes in the level and duration of flooding, for a small winter flood, as a consequence of the combined Parrett Dredge and River Sowy and King's Sedgemoor Drain Enhancement Scheme.

Area	Change (ha)	Change within SSSI	Change outside SSSI	Change within RWLAs	Change outside RWLAs	Change in flood duration
Long Load	-84.1	0	-84.1	0	-84.1	-2 days to -7 days
Wet Moor	-63.4	-1.3	-62.1	0.94	-64.48	-2 days to -7 days
West Moor	-26.1	-25.8	-0.3	-15.26	-10.84	-2 days to -7 days
South Moor	-3.9	0	-3.9	0	-3.9	1 Area -2 days to -7 days
						2 Areas: -12 hrs to -2 days
						2 Areas: No difference
Huish Level	-21.7	0	-21.7	0	-21.7	-2 days to -7 days
Langport Moors	-5.8	0	-5.8	0	-5.8	1 Area -2 days to -7 days
						1 Area: -12 hrs to -2 days
West Sedgemoor	-88.9	-87.7	-1.2	-54.49	-34.41	2 Areas: No difference
						1 Area: -2 days to -7 days
Stanmoor	0	0	0	0	0	No difference
Currymoor	11.8	8.5	3.3	0.8	11	No difference
Northmoor	0	0	0	0	0	No difference

Area	Change (ha)	Change within SSSI	Change outside SSSI	Change within RWLAs	Change outside RWLAs	Change in flood duration
Aller Moor	-205.4	-33.7	-171.7	-15.61	-189.79	6 Areas: -2 days to -7 days
						1 Area: -12 hrs to -2 days
						1 Area: No difference
King's Sedgemoor (SSSI)	47.3	45.4	1.9	-1.1	48.4	3 Areas: -2 days to -7 days
King's Sedgemoor (Butleigh & Walton)	-188.8	0	-188.8	-5.81	-182.99	No flood duration model output available
Moorlinch	7.4	-0.5	7.9	-0.84	8.24	No difference
Southlake	-3.8	-3.8	0	-3.8	0	No difference
Earlake	0	0	0	0	0	No difference
Langmead & Weston	0	0	0	0	0	No difference
Chedzoy	21.7	0	21.7	0	21.7	No difference
Bawdrip & Bradney	0	0	0	0	0	No difference
TOTAL	-604	-99	-505	-95	-509	



Map 3. Indicative change in flood extent for a typical annual winter flood determined from hydraulic modelling of the Parrett Dredging and Sowy projects



Map 4. Indicative change in flood duration for a typical annual winter flood determined from hydraulic modelling of the Parrett Dredging and Sowy projects.

Table 4. Implementation of operational protocols: the current condition status of Parrett SSSIs, and existing remedial actions required for each site to achieve favourable condition status, has been used to inform the selection of mitigation measures. These are required to effect ‘no change’ to existing surface water conditions during winter months (December to February) and ensure no detrimental change in SPA condition as a consequence of the Parrett Dredging and Sowy projects. Indicative change in flood extent and duration for a typical annual winter flood determined from hydraulic modelling (see Table 3 and maps 3 and 4). Abbreviations: WLMP – Water Level Management Plan, RWLA – Raised Water Level Area.

Early warning monitoring – Where there is a high degree of certainty that there will be no adverse effect. Monitoring could provide early warning of any adverse effects.

Validation monitoring – A monitoring plan put in place to validate predicted effects after implantation of required mitigation.

Area	Projected indicative change extent and duration for a typical annual winter flood	Potential mechanism off change (typical winter flood)	Mitigation type	Mitigation objective	Short-term infrastructure improvements	Required mitigation operational protocols	Responsible Body	WLMP update (to incorporate mitigation protocols)	Strategic mitigation options
Long Load	Reduced flood duration (2 to 7 days) and reduced extent (25-100ha).	Increased conveyance in Sowy and Parrett.	Validation monitoring and operational protocols.	Manage water levels to effect ‘no change’ in winter months. Confirm with monitoring.	None proposed.	Adjust winter operation of Long Load pumps and siphon to maintain a minimum water level in ditches and mitigate reduced flood conditions.	EA develop and implement operational protocols (winter 2020/21 - Dec 20 to Feb 21)	No WLMP (prepare 2025)	Operate pumps to sustain wetland conditions in winter.
Wet Moor	Reduced flood duration (2 to 7 days) and reduced extent (25-100ha).	Increased conveyance in Sowy and Parrett.	Validation monitoring and operational protocols.	Manage water levels to effect ‘no change’ in winter months. Confirm with monitoring.	None proposed.	Adjust winter operation of HEPS pumps and North Barrier Sluice to mitigate reduced flood conditions.	EA develop and implement operational protocols (winter 2020/21- Dec 20 to Feb 21)	2022	None proposed.
West Moor	Reduced flood duration (2 to 7 days) and reduced extent (25-100ha).	Increased conveyance in Sowy and Parrett.	Validation monitoring, infrastructure improvements and operational protocols.	Manage water levels to effect ‘no change’ in winter months. Confirm with monitoring.	Refurbish and maintain existing RWLA including refurbishment works on 68 structures.	Adjust winter operation of Midelney pumps to mitigate reduced flood conditions.	EA infrastructure (2020) EA develop and implement operational protocols (2020)	2022	Remove RWLA structures to restore connectivity and operate pumps to sustain wetland conditions in winter.
South Moor	Reduced flood duration (2 to 7 days) and reduced extent (<25ha).	Increased conveyance in Sowy and Parrett.	Early warning monitoring.	Provide evidence of adverse effects.	None proposed.	None proposed.		No WLMP	None proposed.
Huish Level	Reduced flood duration (2 to 7 days) and reduced extent (<25ha).	Increased conveyance in Sowy and Parrett.	Early warning monitoring.	Provide evidence of adverse effects.	None proposed.	None proposed.		No WLMP	None proposed.
Langport Moors	Reduced flood duration (2 to 7 days) and reduced extent (<25ha).	Increased conveyance in Sowy and Parrett.	Early warning monitoring.	Provide evidence of adverse effects.	None proposed.	None proposed.		No WLMP	None proposed.
West Sedgemoor	Reduced flood duration (2 to 7 days) and reduced extent (25-100ha).	Increased conveyance in Sowy and Parrett.	Validation monitoring and operational protocols.	Manage water levels to effect ‘no change’ in winter months. Confirm with monitoring.	None proposed.	Adjust winter operation of IDB weirs (North East Block) to maintain a minimum water level in ditches. Adjust winter operation of pumps and Black Smock Sluice to mitigate reduced flood conditions.	EA/IDB develop and implement operational protocols (2020)	2022	Consolidation of Northside RWLA and operational protocols for enhance floodplain connectivity and floodwater storage in Southside Black Smock system.

Area	Projected indicative change extent and duration for a typical annual winter flood	Potential mechanism off change (typical winter flood)	Mitigation type	Mitigation objective	Short-term infrastructure improvements	Required mitigation operational protocols	Responsible Body	WLMP update (to incorporate mitigation protocols)	Strategic mitigation options
Stanmoor	No change in flood duration(<12hrs) or extent (<25ha).	None. Small pump system unconstrained by river flows and no bank overtopping.	Early warning monitoring.	Provide evidence of adverse effects.	Monitoring: telemetry required for Saltmoor (remote from pumps).	None proposed.		No WLMP	
Currymoor	No change in flood duration(<12hrs) or extent (<25ha).	Pump system influenced by level at Parrett Tone confluence. Interaction between increased conveyance in Parrett and Sowy.	Early warning monitoring and operational protocols.	Provide evidence of adverse effects.	None proposed.	None proposed.		2022	Operate pumps to sustain wetland conditions in winter by either increasing winter pen level or the retention of splash conditions.
Northmoor	No change in flood duration(<12hrs) or extent (<25ha).	None. Pump system unconstrained by river flows and no spillway flow.	Early warning monitoring and operational protocols.	Provide evidence of adverse effects.	None proposed.	Adjust winter operation of Banklands Bridge Weir to maintain a minimum water level in ditches.	IDB develop and implement operational protocols (2020)	2022	
Aller Moor	Reduced duration (2 days) and reduced max extent (100-250ha) of surface water.	Increased conveyance in Sowy and reduced spillway flow after dredge.	Validation monitoring, infrastructure improvements and operational protocols.	Manage water levels to effect 'no change' in winter months. Confirm with monitoring.	Monitoring: telemetry required for Church Drove and Aller Drove.	Adjust winter operations of IDB and EA weirs to maintaining a minimum water level in ditches (IDB: Lucas Rhyne, Black Withies and Leazeway - EA: Beer Wall, Church Drove, Oxleaze Drove and IDB structure Stathe Drove). Adjust winter operation of Langacre Rhyne at Beer Wall, or IDB structures on Lucas, Leazeway and Black Withies Rhyne to mitigate reduced flood conditions.	EA/IDB develop and implement operational protocols (winter 2020/21 – Dec 20 to Feb 21)	2022	Increase floodplain connectivity of Langacre system.
King Sedgemoor SSSI	Reduced flood duration (2 to 7 days) and reduced extent (25-100ha).	Increased conveyance in Sowy and reduced spillway flow after dredge.	Validation monitoring, infrastructure improvements and operational protocols.	Manage water levels to effect 'no change' in winter months. Confirm with monitoring.	Rebuild Egypt Clyse (EA 2020). Maintain existing RWLA (IDB). Monitoring: telemetry required for Middlezoy Moor, Othery Rhyne and RWLA Block 3.	Recent operational changes for Langacre and Othery Rhyne system already provide adequate mitigation.	EA construction (2020) No operational changes required IDB provision of telemetry	2022	Further enhance floodplain connectivity of Langacre system.
Butleigh & Walton KSM	Reduced max extent (100-250ha). No flood duration model output available.	Interaction between increased volume in KSD and reduced spillway flow from Parrett.	Validation monitoring, infrastructure improvements and operational protocols.	Manage water levels to effect 'no change' in winter months. Confirm with monitoring.	Monitoring: telemetry required for 18ft Rhyne and Butleigh Drove.	Adjust operation of Greylake sluice to mitigate reduced flood conditions or seek suitable alternative. For example, adjust winter operation in adjacent areas, Sutton Moor, Pitney, Somerton Moor, Low Ham Moor to maintain a minimum water level in ditches.	EA/IDB develop and implement operational protocols (2020)	2022	Potential for RWLA type schemes.

Area	Projected indicative change extent and duration for a typical annual winter flood	Potential mechanism off change (typical winter flood)	Mitigation type	Mitigation objective	Short-term infrastructure improvements	Required mitigation operational protocols	Responsible Body	WLMP update (to incorporate mitigation protocols)	Strategic mitigation options
Moorlinch	No change in flood duration(<12hrs) or extent (<25ha).	Interaction between increased volume in KSD and reduced spillway flow from Parrett.	Early warning, infrastructure improvements and operational protocols.	Provide evidence of adverse effects.	Rebuild and maintain existing RWLA, including bunds and flap valves. Rebuild Parchey tilting weir.	Restore operation of micro-roost (NE). Adjust winter operation of Shapwick Right Rhyne (IDB) to buffer RWLA and sustain ditch levels and splash conditions across SSSI.	EA construction (2020) IDB develop and implement operational protocols (winter 2020/21 – Dec 20 to Feb 21)	2022	Remove RWLA structures to restore connectivity and operate IDB structures to sustain wetland conditions in winter. Potential to extend winter splash conditions to include Sutton Hams.
Southlake	No change in flood duration(<12hrs) or extent (<25ha).	None	Early warning monitoring.	Provide evidence of adverse effects.	None proposed.	None proposed		2022	Permit warping in February
Earlake	No change in flood duration(<12hrs) or extent (<25ha).	None	Early warning monitoring.	Provide evidence of adverse effects.	None proposed.	None proposed		2022	None proposed.
Langmead & Weston	No change in flood duration(<12hrs) or extent (<25ha).	None	Early warning monitoring.	Provide evidence of adverse effects.	None proposed.	None proposed		2022	None proposed.
Chedzoy	No change in flood duration(<12hrs) or extent (<25ha).	Interaction between increased volume in KSD and reduced spillway flow from Parrett.	Early warning monitoring and operational protocols.	Provide evidence of adverse effects.	None proposed.	Adjust winter operation of Chedzoy Sluice to maintain a minimum depth of water in ditches.	EA develop and implement operational protocols (2020)	2022	Potential for RWLA type scheme, Sedgemoor Drove.
Bawdrip & Bradney	No change in flood duration(<12hrs) or extent (<25ha).	Interaction between increased volume in KSD and reduced spillway flow from Parrett.	Early warning monitoring.	Provide evidence of adverse effects.	None proposed.	None proposed		2022	None proposed.