

Appendix D: Habitats Regulations Assessment



TECHNICAL NOTE

To	<i>Kevin House</i>	Date	<i>17 July 2014</i>		
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From	<i>GBV</i>	Ref	<i>122316 / 0800 / TN1_Rev D.0</i>		
Subject	<i>Rivers Parrett and Tone Dredging</i> <i>Habitats Regulations Assessment: Screening for Consultation with Natural England</i>				
Checked	<i>Kerry Quinton</i>	Reviewed	<i>Matt Clegg</i>	Approved	<i>Fabio Spaliviero</i>

Form HR01: Proforma for new applications within Stage 2 criteria.

ENVIRONMENT AGENCY RECORD OF ASSESSMENT OF LIKELY SIGNIFICANT EFFECT ON A EUROPEAN SITE (STAGE 2)
The new application for dredging an approximately 8km section of the River Parrett and River Tone, below, is within the Stage 1 criteria for the Somerset Levels and Moors Natura 2000 site, and in order to progress the application a Stage 2 assessment and consultation with Natural England is required.

PART A

To be completed by relevant technical/project officer in consultation with Conservation/Ecology section and Natural England

1. Type of permission/activity:	Rivers Parrett and Tone Dredge
2. Agency ref. no:	
3. National Grid reference:	River Tone: ST338278 to ST358302 River Parrett: ST358302 to ST331331
4. Site reference:	Upstream and downstream of the River Parrett and River Tone confluence
5. Brief description of proposal:	<p><u>Overview</u></p> <ul style="list-style-type: none"> An approximately 3.5km section of the River Tone upstream of its confluence with the River Parrett, and an approximately 4.5km section of the River Parrett downstream of where it is joined by the River Tone, will be widened to increase flow capacity and reduce flood risk. The River Parrett flows into the Severn Estuary at Bridgwater Bay, approximately 24km downstream of the river section to be dredged. No follow-up maintenance is proposed; therefore, the project comprises a one-off dredge limited to a total of 8km of river. Banks within the dredge area of the River Parrett are also to be restored to their 1960s profile; which will involve raising between 200mm and 600mm. The location in relation to the Somerset Levels and Moors and Severn Estuary Natura 2000 sites is shown on drawing 122316-00006 (Annex A). <p><u>Rationale</u></p> <ul style="list-style-type: none"> The sections of River Parrett and River Tone to be dredged were widened in 1960's to provide increased storage and flow in the main arterial rivers. Since then, sediment has built up on along banks, narrowing the channels. This has reduced flow capacity by between approximately 20% and 40% when compared to immediately after the 1960's scheme, with the amount of reduction varying between different sections. Cross sections of the existing and 1960's channel profiles are attached in Annex B. The bank restoration element will be delivered in tandem with a series of isolated defence improvements within the dredge reaches on the Parrett and Tone to help reduce the frequency, duration and extent of flooding for Curry Moor, Hay Moor and North Moor. The River Parrett and River Tone have a long history of overtopping their banks in both summer and winter. The project aim is to reduce the risk of flooding to properties, the road and rail network, and relieve existing flood extents and durations on Curry Moor, Hay Moor, North Moor and Salt Moor (which include both internationally and nationally designated nature conservation sites). The dredging works will reduce the risk of flooding within the area of benefit (Drawing 122316-00002, Annex A) for up to five years. The bank restoration will have longer term (up to 10 years) flood risk management benefits. <p><u>Location</u></p> <ul style="list-style-type: none"> The reach of the River Tone to be dredged is between Curload (NGR ST338278) and the confluence with the River Parrett and Burrowbridge (NGR ST358301). The reach of the River Parrett to be dredged is between Burrowbridge (NGR ST358301) and Moorland Court Farm (near Andersea) (ST329332).

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	<ul style="list-style-type: none"> • A stand-alone dredging scheme (Moorland House Farm Dredge) will be carried out before the main works commence, along a 200m section of the River Parrett immediately downstream of Moorland House Farm, (ST346319 to ST343320). • None of the reaches to be dredged are within a Natura 2000 site, but the works area is adjacent to the component parts of the Somerset Levels and Moors site at Curry Moor and Southlake Moor. • Bank restoration will be undertaken along the River Parrett within the same reaches as the dredge. Some bank raising is required in the Southlake Moor component of the Somerset Levels and Moors Natura 2000 site.
<p>Brief description of proposal (continued):</p>	<ul style="list-style-type: none"> • A map of the proposed reaches to be dredged in relation to Natura 2000 sites is shown on drawing 122316-00007 (Annex A). <p><u>Method of Dredging</u></p> <ul style="list-style-type: none"> • Material will be removed by mechanical plant. The majority will be dredged by an excavator from the river banks, but pontoon mounted excavators will need to be used in some locations on the River Parrett due to access difficulties. • Dredged material will be placed on the landward faces of flood defences, spread across farmland, or disposed of in a licenced landfill site depending on the contamination and salinity levels of the material. The material to be dredged will be tested before dredging starts to inform the disposal method. • Temporary stockpiling of dredged materials will be required in the short term whilst conditions improve for spreading; later in the programme silt will be spread direct to land without stockpiling, unless conditions deteriorate. • No material will be stockpiled or spread within a Natura 2000 site. • All licences to stockpile and dispose of material will be obtained by the dredging contractor. • There will be an average of 4, and up to 8, dredging teams working at any one time, with approximately 6 people per team including 2 tractor operators. <p><u>Method of bank restoration</u></p> <p>Dredged material will be used as construction material. The dredged material will be temporarily stockpiled behind the existing banks and then used to re-form the banks to their original design profile. Where there is insufficient space to stockpile material behind the existing flood banks, adjacent fields will be temporarily used for storage (subject to landowner agreement). No stockpiling will be carried out within Natura 2000 sites unless agreed with NE.</p> <p>Two distinct construction methods will be used to restore the profile of the banks dependent on whether minor raising or an engineered re-build is required:</p> <ul style="list-style-type: none"> • Minor bank raising will involve transporting material to the flood bank in agricultural trailers, tipping (if space is available) or unloading material using an excavator onto the bank and then carrying out informal compaction of the bank by tracking over with an excavator. • Engineered rebuilding of the embankment will require stripping/cutting back the embankment, cutting a bench into the embankment, placing material and compacting/re-forming with formal compaction plant. <p><u>Programme</u></p> <ul style="list-style-type: none"> • The Moorland House Farm Dredge will start in March 2014, and is predicted to last for approximately 6 weeks. • The main works are programmed for between April and October 2014. • There is potential for dredging to extend into winter 2014 depending on progress and weather conditions. • Dredging will be completed in spring/summer 2015 if necessary. • If dredging is needed over winter, then no works will take place within 250m of the boundary of the Somerset Levels and Moors Natura 2000 Site. The Moorland House Farm Dredge is greater than 1.5km from the nearest

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	<p>boundary.</p> <ul style="list-style-type: none"> • Bank restoration will be carried out in parallel to the dredging; beginning in August 2014 and finishing by end of October 2014. Bank restoration is expected to progress at a minimum rate of 100m/day.
6. European site name(s) and status:	<ul style="list-style-type: none"> • Somerset Levels and Moors SPA • Somerset Levels and Moors Ramsar site • Severn Estuary SAC • Severn Estuary SPA • Severn Estuary Ramsar site • Severn Estuary European Marine Site (comprises the SAC, SPA and Ramsar)
7. List of interest features:	
<ul style="list-style-type: none"> 1.12 Estuarine & intertidal habitats 1.13 Submerged marine habitats 2.5 Anadromous fish 2.6 Non-migratory fish & invertebrates of rivers 3.4 Birds of lowland wet grasslands 3.6 Birds of lowland freshwaters and their margins 3.7 Birds of farmland 3.9 Birds of estuarine habitats 	
<u>Somerset Levels and Moors Special Protection Area (SPA)</u>	
Species qualifying under article 4.1 of the Wild Birds Directive (Directive 2009/147/EC):	
<ul style="list-style-type: none"> • Bewick's swan <i>Cygnus columbianus bewickii</i> (over winter) [3.4, 3.6, 3.7] • European golden plover <i>Pluvialis apricaria</i> (over winter) [3.4, 3.7]. 	
Species qualifying under article 4.2 of the Wild Birds Directive (Directive 2009/147/EC):	
<ul style="list-style-type: none"> • Eurasian teal <i>Anas crecca</i> (over winter) [3.4, 3.6] • Northern lapwing <i>Vanellus vanellus</i> (over winter) [3.4, 3.7, 3.9]. • Internationally important assemblage of birds: over winter the area regularly supports 73,014 waterfowl (5 year peak mean 01/04/1998) including Bewick's swan, European golden plover, Eurasian teal, and northern lapwing [3.4, 3.6, 3.7, 3.9]. 	
Additional features identified by 2001 SPA review:	
<ul style="list-style-type: none"> • Eurasian wigeon <i>Anas penelope</i> (over winter) [3.6, 3.7, 3.9] • Northern shoveler <i>Anas clypeata</i> (over winter) [3.6, 3.9]. 	
<p><i>Note:</i> JNCC standing advice is that "the individual site accounts in 2001 Review should be taken as the definitive list of qualifying species at the SPAs concerned. However, at sites where there remain differences between that list of qualifying species and the extant site citation, then the relevant country agency should be contacted for further guidance" (http://jncc.defra.gov.uk/page-5485).</p>	
<u>Somerset Levels and Moors Ramsar site</u>	
The Somerset Levels and Moors qualifies under Ramsar criteria 2, 5, and 6 for the following reasons	
<ul style="list-style-type: none"> • Criterion 2: Supports 17 species of British Red Data Book invertebrates (see table below). • Criterion 5: Assemblages of international importance: Species with peak counts in winter: 97,155 waterfowl (5 year peak mean 1998/99-2002/2003) [3.4, 3.6, 3.7, 3.9] • Criterion 6: Species/populations occurring at levels of international importance: Bewick's swan Eurasian teal, Northern lapwing [3.4, 3.6, 3.7, 3.9]. 	
The designated invertebrate assemblage is associated with the moorlands and network of small rhynes and ditches. The 17 British Red Data Book invertebrates listed under Ramsar criterion 2 are:	

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<i>Hydrochara caraboides</i>	Lesser silver water beetle
<i>Bagous nodulosus</i>	Flowering Rush Weevil
<i>Odontomyia angulata</i>	Orange-horned green colonel (species of soldier fly)
<i>Oulema erichsoni</i>	
<i>Valvata macrostom</i>	Species of minute freshwater snail ('Parrett snail'?)
<i>Odontomyia ornate</i>	Ornate brigadier (species of soldier fly)
<i>Stethophyma grossum</i>	Large marsh grasshopper
<i>Pteromicra leucopeza</i>	Species of marsh fly
<i>Lejops vittat</i>	Sea club-rush hoverfly
<i>Cantharis fusca</i>	Type of soldier beetle
<i>Paederus caligatus</i>	
<i>Hydaticus transversalis</i>	Species of predatory water beetle
<i>Dytiscus dimidiatus</i>	Species of diving beetle
<i>Hydrophilus piceus</i>	Great Silver Water Beetle
<i>Limnebus aluta</i>	
<i>Laccornis oblongus</i>	Species of diving beetle

Severn Estuary Special area of Conservation (SAC)

Annex I Habitats:

- Estuaries (1.12)
- Mudflats and sandflats not covered by seawater at low tide (1.12)
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) (1.12)
- Sandbanks which are slightly covered by sea water all the time (1.13)
- Reefs (1.13).

Annex II Species:

- Sea lamprey (2.5)
- River lamprey (2.5)
- Twaite Shad (2.5).

Severn Estuary (SPA)

Species qualifying under **article 4.1** of the Wild Birds Directive (Directive 2009/147/EC):

- Bewick's swan *Cygnus columbianus bewickii* (over winter) [3.4, 3.6, 3.7]

Species qualifying under **article 4.2** of the Wild Birds Directive (Directive 2009/147/EC):

- Gadwall *Anas strepera* [3.6]
- White fronted goose *Anser albifrons* [3.6, 3.7, 3.9]
- Dunlin *Calidris alpina* [3.4, 3.7, 3.9]
- Shelduck *Tadorna tadorna* [3.6, 3.9]
- Redshank *Tringa totanus* [3.4, 3.7, 3.9]
- Internationally important assemblage of birds: over winter the area regularly supports 84,317 waterfowl (5 year peak mean 01/04/1998) including Bewick's swan, white-fronted goose, shelduck, gadwall, dunlin and redshank.

Severn Estuary Ramsar site

The Severn Estuary qualifies under Ramsar criteria 1, 2, 4, 5, 6 and 8 for the following reasons:

- Criterion 1: Immense tidal range (second-largest in world), this affects both the physical environment and biological communities.
- Criterion 2: Unusual estuarine communities, reduced diversity and high productivity.

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- Criterion 4: important for the run of migratory fish between sea and river via estuary. Species include Salmon *Salmo salar*, sea trout *S. trutta*, sea lamprey *Petromyzon marinus*, river lamprey *Lampetra fluviatilis*, allis shad *Alosa alosa*, twaite shad *A. fallax*, and eel *Anguilla anguilla*. It is also of particular importance for migratory birds during spring and autumn.
- Criterion 5: Assemblages of international importance: Species with peak counts in winter: 70919 waterfowl (5 year peak mean 1998/99-2002/2003).
- Criterion 6: Species/populations occurring at levels of international importance: Bewick's swan Eurasian teal, Greater white-fronted goose, common shelduck, gadwall, dunlin, common redshank
- Criterion 8: The fish of the whole estuarine and river system is one of the most diverse in Britain, with over 110 species recorded. Salmon, sea trout, sea lamprey, river lamprey, allis shad, twaite shad, and eel use the Severn Estuary as a key migration route to their spawning grounds in the many tributaries that flow into the estuary. The site is important as a feeding and nursery ground for many fish species particularly allis shad and twaite shad.

Designation Notes

Sites qualify to be an SPA under Article 4.1 of the Wild Birds Directive (Directive 2009/147/EC) if they are used regularly by 1% or more of the Great Britain populations of species listed on Annex 1 of the Directive in any season.

Sites qualify to be an SPA under Article 4.2 of the Wild Birds Directive (Directive 2009/147/EC) if they are used regularly by 1% or more of the biogeographical populations of regularly occurring migratory species (other than those listed under Annex 1), and/or regularly support an internationally important assemblage of waterbirds (waterbirds as defined by the Ramsar Convention) in any season.

Sites qualify to be an SAC under the Habitats Directive (92/43/EEC) if they support internationally important examples or populations of habitats listed on Annex I of the Directive and/or species listed on Annex II of the Directive.

Sites qualify as a wetland of international importance under the Ramsar Convention if they meet one or more of nine criteria used to identify wetlands of international importance.

8. Is the proposal directly connected with or necessary to the management of the site for nature conservation?

No.

The purpose of the proposal is to reduce the risk of flooding from the River Parrett and River Tone in order to protect properties.

However, reducing flood risk could also reduce the risk of summer floods within the Somerset Levels and Moors Natura 2000 site, and the duration that deep flood waters remain on the Somerset Levels and Moors Natura 2000 site over winter; this may have beneficial effects on Natura 2000 interest features. Removing river sediment that contains contaminants including heavy metals and hydrocarbons may have a long term beneficial effect as it removes a source of contamination from the river, moorland and estuary system.

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9. What potential hazards are likely to affect the interest features? (Refer to relevant sensitivity matrix and only include those to which the interest features are sensitive). Are the interest features potentially exposed to the hazard?

Sensitive Interest Feature:								Potential hazard:	Potential exposure to hazard and mechanism of effect/impact if known:								
1.12	Estuarine & intertidal habitats	1.13	Submerged marine habitats	2.5	Anadromous fish	3.4	Birds of lowland wet grasslands	3.6	Birds of lowland freshwaters & their margins	3.7	Birds of farmland	3.9	Birds of estuarine habitats	Assemblage of invertebrates			
				X	X					X					A	Habitat loss	<p>No dredging or disposal of dredged material will take place within Natura 2000 (N2K) sites. However, dredging may remove vegetation used as refuges and feeding areas by salmon, eels and other fish that form part of the Severn Estuary populations. Such habitat loss will be outside of the Natura 2000 site boundary.</p> <p>Bank restoration in Southlake Moor will result in up to 2m of additional land take from the existing toe of the flood defence embankment over approx. 150m where the bank is reprofiled.</p>
															B	Changes in physical regime (geomorphology)	<p>Widening river channels has potential to alter erosion and sedimentation regimes. However, the proposed scheme will only marginally reduce water levels upstream of the works (i.e. those sections of the River Tone within the N2K site) and will not alter the upstream sediment dynamics. The removal of intertidal sediment during the works will result in a temporary short-term change in hydromorphology which may affect downstream habitats within the Severn Estuary. As this is a one off dredging activity, this will be a negligible change within the wider context of the Severn Estuary and is unlikely to impact on intertidal habitats outside of normal range of natural variability. Further details are provided in the Water Framework Directive compliance assessment completed for the scheme.</p>

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			X						D	Turbidity	Dredging will cause a temporary increase in turbidity within the main river channels. Dredging will not take place within any N2K site, and the hydrological and tidal regime of the rivers mean that sediment mobilised by the works is not likely to reach either the Somerset Levels and Moors or the Severn Estuary N2K site. However, turbidity could affect mobile species of the of the Severn Estuary SAC/Ramsar site that use river channels outside of designated areas.
			X						E	Habitat/community simplification	Dredging could create uniformly steep sided channels lacking in shallow areas: shallow areas may be important during the summer for growth of juvenile fish that form part of the Severn Estuary populations.
			X	X	X	X			F	Disturbance	Potential to disturb migratory and overwintering birds if works start before April and / or extend beyond October. Potential to disturb nesting waterbirds that may contribute to the wintering population. Potential for noise and vibration to affect migratory fish species that use river channels outside of designated areas.
									G	Competition from non-native species	Japanese knotweed and Himalayan balsam are known to be in the project area; standard mitigation techniques will be used to avoid the spread of such species. Floating pennywort has been recorded historically on the River Tone but has not seen since floods of 2012/13.
									H	Changes to flow & velocity regime	Although widening river channels will increase channel capacity, it will not significantly alter the flow velocity due to the very shallow river gradients.

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			X	X	X		X	I	Changes to surface water flooding	Reduced overtopping of the Tone and Parrett could affect the condition of wet grassland and ditch habitats that support invertebrate and wintering bird species on Curry Moor; bank restoration would cause no significant change to this impact. Bank restoration could cause a very minor increase in tidal overtopping into Southlake Moor. There would be no impact to the hydrology West Sedgemoor or King Sedgemoor component parts of the Somerset Levels and Moors SPA/Ramsar.
		X						J	Changes to water chemistry	Dredging could cause temporary changes to water chemistry of the main river channels, including altered dissolved oxygen levels, contaminant levels and subsequent algal blooms. This could affect migratory fish species of the Severn Estuary SAC/Ramsar site that use river channels outside of designated areas.

10. Is the potential scale or magnitude of any effect likely to be significant?	
a) Alone?	<p>Yes (due to uncertainty)</p> <p><u>Anadromous fish</u></p> <p><i>Severn Estuary SAC species: within the Parrett & Tone</i></p> <p>Anadromous fish spend the adult part of their lifecycle in the sea but migrate to freshwater to spawn. A proportion of populations of the anadromous SAC species which could be said to belong to the Severn Estuary SAC will make use of the Parrett and Tone catchments for their freshwater life stages. There is no formal survey data on the species which utilise the Tone and Parrett and little other information, thus the actual extent to which these species use the rivers is unknown. However, whilst the proportion of the populations of the Severn Estuary SAC that rely on the other major rivers entering the Severn is significant (the Wye and Usk are known to host freshwater life stages of the species concerned in significant numbers), the support that the river habitat of the Parrett and Tone provides is likely to be of significantly less, because:</p> <ul style="list-style-type: none"> a) the lowland reaches of the Parrett and Tone are heavily modified, and arguably less inherently suitable to lamprey and shad; and b) the Parrett and the Tone are much smaller (thus offering less habitat of any type). <p>Thus, although the proportion of the SAC populations used by the Tone and Parrett is likely to be comparatively small, uncertainty surrounds the extent to which they are able to provide significant support to the SAC populations of anadromous fish species. Despite this it is very unlikely that the temporary loss and simplification of river habitat provided by the Tone and the Parrett in itself will lead to a significant effect on such fish populations due to its current sub-optimal condition.</p> <p>However, dredging has an inherently high risk of causing deterioration in water quality, particularly during periods of elevated temperature and reduced flow that are typically encountered in the summer, to the extent that fish mortality is possible. As a result water quality impacts are the primary mechanism of impact on fish species. Dredging will encompass the entire channel width for some length of the channel and this, plus the timing of the dredge during migratory periods, means that potentially all anadromous species entering the river will be exposed to changes in water quality. Additionally, noise and vibration caused by dredging have potential to affect fish in the direct vicinity of the dredge, acting in tandem with water quality effects.</p> <p>The magnitude of population effect will be to a large extent determined by the water quality consequences of the dredge and the proportion of the SAC population which is exposed to this effect, which are uncertain.</p> <p>Due to uncertainty, it cannot be concluded that there will be no likely significant effect on Severn Estuary SAC anadromous species within the Rivers Parrett and Tone.</p> <p><i>SAC species: within the Severn Estuary</i></p> <p>The potential for water quality impacts to extend beyond the Parrett and into the Severn Estuary Ramsar is considered to be highly unlikely due to the low energy/gradient of the rivers in this part of the catchment. Water quality effects will be localised in Tone and the Parrett.</p> <p>It can be concluded that there will be no likely significant effect from the dredging activities on Severn Estuary SAC anadromous species within the Estuary.</p>

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10 (a) Alone? (continued)	<p><i>Ramsar Criteria 4 – Migratory fish including salmon, sea trout, sea lamprey, river lamprey, shads and eel.</i></p> <p>Considerations for both lamprey and shads are identical to those outlined for the Severn Estuary SAC designation above. However, the Ramsar Criteria 4 designation requires additional consideration of Atlantic salmon, sea trout and eel (eels are catadromous, i.e. spend most of their adult lives in freshwater but migrate to the sea to breed).</p> <p>No systematic survey data exists on the extent to which the estuarine Ramsar salmon population utilises the Parrett and Tone catchment. However, it is regarded as a recovering system with regards to salmon, with an adult population size likely to be in the tens or possibly low hundreds, and with incidental visual observations during the 2013 spawning run suggesting the greatest number of returning adults in recent years (Andy Baines, EA Technical Specialist, Pers. Comm.). Such values are small in the context of the main rivers contributing to the Severn population (Usk, Wye and Severn) and neither the Parrett nor the Tone are designated as salmonid waters. However, the Parrett and the Tone populations should be considered as contributing to the resilience and diversity of the overall Severn Estuary SAC salmon population.</p> <p>Data on sea trout from the Parrett and Tone is similarly not available. Data from the Severn Estuary and the other main Severn rivers indicates that sea trout are numerically much less abundant than salmon, perhaps indicating that the rivers and estuary are inherently not conducive to sea trout. Nonetheless, it is conceivable that the Parrett and Tone do receive sea trout.</p> <p>Data on the upstream migration of glass eels into the catchment is recorded at Oath Lock. This samples a proportion of the run, with over 146,000 glass eels being recorded in 2013. This is likely to equate to several million glass eels entering the system annually (Andy Baines, EA Fish Technical Specialist, Pers. Comm.).</p> <p>Salmon and sea trout are susceptible to reduced water quality, in particular low dissolved oxygen, which is one likely temporary consequence of dredging when material needs to be removed from below the water line. Combined with elevated suspended solids, there is a significant prospect of mortality of salmon and sea trout as a result of dredging below the water line. Additionally, noise and vibration caused by dredging have potential to affect fish in the direct vicinity of the dredge and this may act in tandem with water quality effects.</p> <p>Glass eels are considered less susceptible to water quality effects, and significant mortalities are not considered likely.</p> <p>Whether water quality and noise / vibration effects are significant in a Habitats Regulations context is largely dependent on the water quality consequences of the dredge and the proportion of the Ramsar population which is likely to be exposed to this effect, which is uncertain.</p> <p>Due to uncertainty, it cannot be concluded that there will be no likely significant effect on Ramsar Criteria 4 fish species of eel, salmon and sea trout.</p> <p><i>Ramsar Criteria 8 - Severn Estuary Ramsar general fish community</i></p> <p>The fish community (all species) of the Severn Estuary fall within the scope of the Habitats Regulations by virtue of the Estuary's Ramsar designation, specifically via criterion 8. Potential effects of the scheme therefore need to be considered within the rivers, where estuarine or anadromous species are potentially present.</p>

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<p>10 (a) Alone? (continued)</p>	<p><u>Within the Severn Estuary:</u></p> <p>The impacts within the Estuary are essentially identical as those outlined above in respect of anadromous species, although the Ramsar element also requires consideration of the wider estuarine fish community (110 species). Due to the low energy/gradient of the river system, the dredge plume will be retained within the Parrett and Tone and no effect is anticipated within the estuary.</p> <p><u>Within the Parrett and Tone:</u></p> <p>As noted in respect of the Severn Estuary SAC anadromous population, this entity will require migratory passage through the rivers. However, considering the wider Ramsar Severn fish community various species will enter the lower river from the Estuary and make use of it for feeding and refuge, particularly juvenile stages of a number of species, in the summer. Dredging related water quality deterioration together with noise and vibration impacts would have potential to impact on such species (sub lethal and lethal effects) and removal of naturally occurring substrate may also have implications for feeding opportunities for benthic species such as juvenile flatfish.</p> <p>The area affected will be small in the context of the Severn as a whole, and the life stages affected (mainly juvenile) are those from which compensatory survival may operate. However, there is uncertainty about the effects of the dredge on water quality and habitats and about the proportion of the Ramsar population which is likely to be exposed to adverse effects.</p> <p>Due to uncertainty, it cannot be concluded that there will be no likely significant effect on Ramsar Criteria 8 fish community.</p> <p><u>Wintering birds: disturbance over winter</u></p> <p>The majority of dredging work is scheduled to take place between April and October 2014; bank restoration will occur between August and October 2014. This will avoid disturbance to overwintering birds.</p> <p>The Moorland House Farm Dredge is programmed to start in March 2014, but the works will be greater than 1.5km from the nearest boundary of the Somerset Moors and Levels Natura 2000 site at Southlake Moors. Therefore, wintering birds will not be disturbed. Movement of machinery to get to the dredge is considered to be similar to farming practices, to which birds will be habituated.</p> <p>There is potential for dredging to extend beyond October into winter 2014. The dredging schedule will be organised so that all areas within 250m of a Natura 2000 site boundary (i.e. the sections of river adjacent to Curry Moor and Southlake Moor) will be dredged before November to avoid disturbing overwintering birds.</p> <p>With this mitigation, there will be no likely significant effects on wintering birds from disturbance.</p> <p><u>Wintering birds: disturbance to breeding water birds that form part of designated overwinter populations</u></p> <p>The Somerset Levels and Moors support breeding water birds including lapwing, snipe, curlew and redshank. However, the habitats at Curry Moor, Southlake Moor, and also the North Moor SSSI, are managed for wintering birds and not breeding birds. The key breeding area is at the RSPBs Greylake reserve and birds also breed on Kings Sedgemoor; both these sites are more than 5km from the dredging and bank restoration works.</p> <p>There will be no likely significant effects on breeding water birds from disturbance.</p>
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TECHNICAL NOTE

10 (a) Alone? (continued)

Wintering birds: changes in habitat quality from ~~reduced~~ changes to surface water flooding

No dredging will take place within the Somerset Levels and Moors SPA and Ramsar site, and no dredged material will be disposed of within the site; therefore, there will be no direct effects on habitats that support wintering birds.

The splashy conditions required to maintain suitable wintering bird conditions can largely be controlled by water level management measures within the moors drainage systems.

There is potential for indirect effects due to changes in habitat condition from reduced overtopping of the River Tone into Curry Moor. Changes in habitat quality could affect wintering waterbird populations of both the Somerset Levels and Moors and the Severn Estuary SPA and Ramsar sites; the Severn Estuary population use the Somerset Levels and Moors as an alternative wintering site. The effects of dredging on the frequency of overtopping into Curry Moor, and on the resultant condition of habitats, are uncertain. Bank restoration would have no noticeable additional impact to that of the dredge.

Bank restoration, in combination with the dredge, will not have any significant effects to the hydrology of the designated sites, specifically:

1. Southlake Moor is deliberately flooded when required from a structure on the River Sow. Bank restoration will not effect this operation. The only impacts on Southlake will be from increased tidal overtopping from the Parrett but this will just be for a short duration during high tides and will be in the form of small increases to existing flows. Although this overtopping comes as a result of high tides, the tide effectively prevents the fluvial flow from continuing downstream. Therefore the overtopping at Southlake mainly consists of non-saline water. In addition salinity levels would be much diluted from other fluvial flows entering Southlake during such an event. Therefore there would be no significant impact from a salinity perspective.
2. There would be no impact to West Sedgemoor or King Sedgemoor component parts of the SPA/Ramsar. For West Sedgemoor this is because the banks are designed so that the right bank (into Aller Moor) is lower than the left bank (into West Sedgemoor). Therefore the impact of higher tide levels is that there is increased overtopping over the right bank, but minimal or no overtopping on the left bank into West Sedgemoor. Tidal overtopping over the right bank will generally take place around Beasleys spillway. This overtopping will generally be then carried in bank in the Sow, and will be combined with the fluvial flow. If there is significant overtopping into the neighbouring moors (Aller Moor, Kings Sedgemoor and Southlake) then this will be due to the fluvial component of the flow which will be the same as before the bank restoration works.
3. Through the bank raising on the Parrett there will be an increased tidal peak on the River Tone. This will result in slightly higher overtopping over the banks and Hookbridge spillway in extreme events. However the volume of this overtopping will be minimal due to the duration of it (and will be a small fraction of the overtopping volumes in a fluvial event). It will also be contained within the drainage network within the moor. Therefore the further increase in flooding to Curry Moor and Hay Moors from bank restoration would be negligible.

The effects of the dredge will last up to five years; the effects of the restoration will last at least 10 years.

TECHNICAL NOTE

<p>10 (a) Alone? (continued)</p>	<p>There will be no likely significant effects on habitat quality from increased tidal overtopping.</p> <p>Due to uncertainty, it cannot be concluded that there will be no likely significant effect on wintering birds due to reduced changes in surface water flooding on Curry Moor.</p> <p><u>Wintering birds: loss of supporting habitat.</u></p> <p>Bank restoration in Southlake Moor will result in up to 2m additional land take from the existing toe of the flood defence embankment over approx. 150m where the bank is reprofiled. As this habitat is on the periphery of the site, adjacent to the existing flood embankment, it is not likely to be core supporting habitat for either wintering or breeding waterbirds that form part of the designated overwintering populations. Banks will be sown with NVC MG5c mix.</p> <p>Given size and location of the land affected there will be no likely significant effects on wintering birds from land take.</p> <p><u>Assemblage of invertebrates</u></p> <p>The designated Ramsar assemblage of Red Data Book invertebrates is associated with moorland habitats, including the networks of small rhynes and ditches. No dredging will take place within the Ramsar site, and no dredged material will be disposed of within the Ramsar site. As a result, there will be no direct effects on habitats that support invertebrates within the designated area.</p> <p>As for wintering birds, there is potential for indirect effects due to changes in habitat condition from reduced overtopping of the River Tone into Curry Moor. The effects of dredging on the frequency of overtopping and the condition of habitats are uncertain.</p> <p>Due to uncertainty, it cannot be concluded that there will be no likely significant effect on the Ramsar Criteria 2 invertebrate assemblage in Curry Moor.</p> <p>Bank restoration may cause a slight increase in tidal flooding into Southlake Moor but the banks already overtop during high tides. The salinity levels are diluted by the fluvial flows at these times and this change will not impact habitat quality of the rhynes and ditches (see <i>wintering birds</i> above). There will be no likely significant effects on assemblage of invertebrates.</p>
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T E C H N I C A L N O T E

<p>b) In combination with other Environment Agency permissions and/or other plans or projects?</p>	<p>No.</p> <p>Maintenance work to various structures that form the Curry Moor flood storage reservoir (including walls, embankments and at a pumping station) will be carried out between April and October 2014. Although these works will take place within the Somerset Levels and Moors SPA and Ramsar site, they comprise maintaining existing structures and will be outside of the wintering bird period. Therefore, there is no potential for significant effects in combination with the Rivers Parrett and Tone Dredge.</p> <p>The Environment Agency and Local Authorities are working together to develop a long-term plan to manage flood risk and water levels on the Somerset Levels and Moors. Details of the Somerset Levels and Moors Flood Action Plan were released in March 2014, setting out a number of objectives including to reduce flooding, increase resilience, maintain and enhance connectivity with Somerset to the rest of the country and to protect the special characteristics of the local environment over the course of the next 20 years. The plan includes a number of different approaches to flood risk management including dredging and river management, land management, urban water management and building of local resilience. The measures listed within the plan include a combination of short and long term and relatively cheap and expensive plans. Most works are not likely to commence until after the majority of the dredging and associated bank restoration works are complete, other than routine maintenance works. If any works associated with the 20 year plan require a Habitats Regulations Assessment (HRA) and/or an EIA, an assessment of cumulative effects, giving regard to the dredging of the rivers Parrett and Tone and reinstatement of bank profiles, will be undertaken and documented within the HRA/ Environmental Statement.</p> <p>Asset recovery works along the sections of the Parrett and Tone being dredged will involve a combination of hard and soft engineering techniques. Only the restoration of the river bank profiles using dredged material is considered as EIA development and are assessed within this document and the associated ES addendum. This soft river bank raising is limited to the River Parrett.</p> <p>Minor civil works on the hard defences will be undertaken over a broadly similar construction programme to the dredging and bank restoration works. The works will typically involve a combination of raising walls, installing and raising piles with reinforced concrete caps and construction of new hard defences. Exact details of these works are currently unknown, however, the mitigation actions that form part of the Environmental Action Plan (EAP) for the dredge and bank restoration works will form the basis of the subsequent EAPs that will be prepared for the minor civil works.</p> <p>Consequently environmental impacts will be subject to the same degree of mitigation, control and monitoring and no significant cumulative impacts are expected.</p> <p>Any minor civil works that require further consents such as SSSI Assent, planning or Listed Building Consent will consider the cumulative impacts of the dredging and bank restoration.</p> <p>The assessment above takes into account bank restoration for both hard and soft defences along the River Parrett. Additional minor capital works on the Tone, between Hook bridge and the confluence with the Parrett, are likely to comprise re-enforced concrete capping of existing sheet piles in localised locations. The impact of raising these piles would not have any further impact of the hydrology of Curry Moor.</p>
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T E C H N I C A L N O T E

<p>c) In combination with permissions and/or plans/projects of other Competent Authorities?</p>	<p>No</p> <p>There are no other known permissions, plans or projects that have potential to interact with the proposed dredging works.</p>	
<p>11. Conclusion: Is the proposal likely to have a significant effect ‘alone and/or in combination’ on a European site? (Justification – attach any relevant supporting information and the reasons for coming to the particular conclusion)</p>	<p>Yes</p> <p>The assessment of likely significant effects is described in section 10, above. The assessment found that, due to uncertainty, it cannot be concluded that there will be no likely significant effects on the following sites and features:</p> <p><u>Somerset Levels and Moors SPA:</u></p> <ul style="list-style-type: none"> • Wintering waterbirds <p><u>Somerset Levels and Moors Ramsar</u></p> <ul style="list-style-type: none"> • Wintering waterbirds • Assemblage of Red data Book invertebrates <p><u>Severn Estuary SAC and Ramsar:</u></p> <ul style="list-style-type: none"> • Migratory fish species <p><u>Severn Estuary SPA and Ramsar:</u></p> <ul style="list-style-type: none"> • Wintering waterbirds (the Severn Estuary population also use the Somerset Levels and Moors as an alternative wintering site). 	
<p>12. Justification for Reduced Consultation review process: A brief justification should be written outlining why each application is thought to be minor or large/complex, and thus why you are sending to Natural England for either information or consultation.</p>	<p>The project is considered to be a priority for the Environment Agency in order for works to be completed before winter 2014/15 to reduce flood risk to communities.</p>	
<p>13. Name of EA Officer:</p>		<p>Date:</p>
<p>14. Natural England comment on assessment</p>		
<p>15. Name of Natural England Officer:</p>		<p>Date:</p>
<p>IF THE PROPOSAL IS LIKELY TO HAVE A SIGNIFICANT EFFECT AN APPROPRIATE ASSESSMENT WILL BE REQUIRED (see part B for suggested scope).</p>		

<p>Part B - SUGGESTED SCOPE OF THE APPROPRIATE ASSESSMENT:</p>		
<p>16. Natural England Comment on scope of appropriate assessment:</p>		
<p>16. Name of Natural England Officer:</p>		<p>Date:</p>

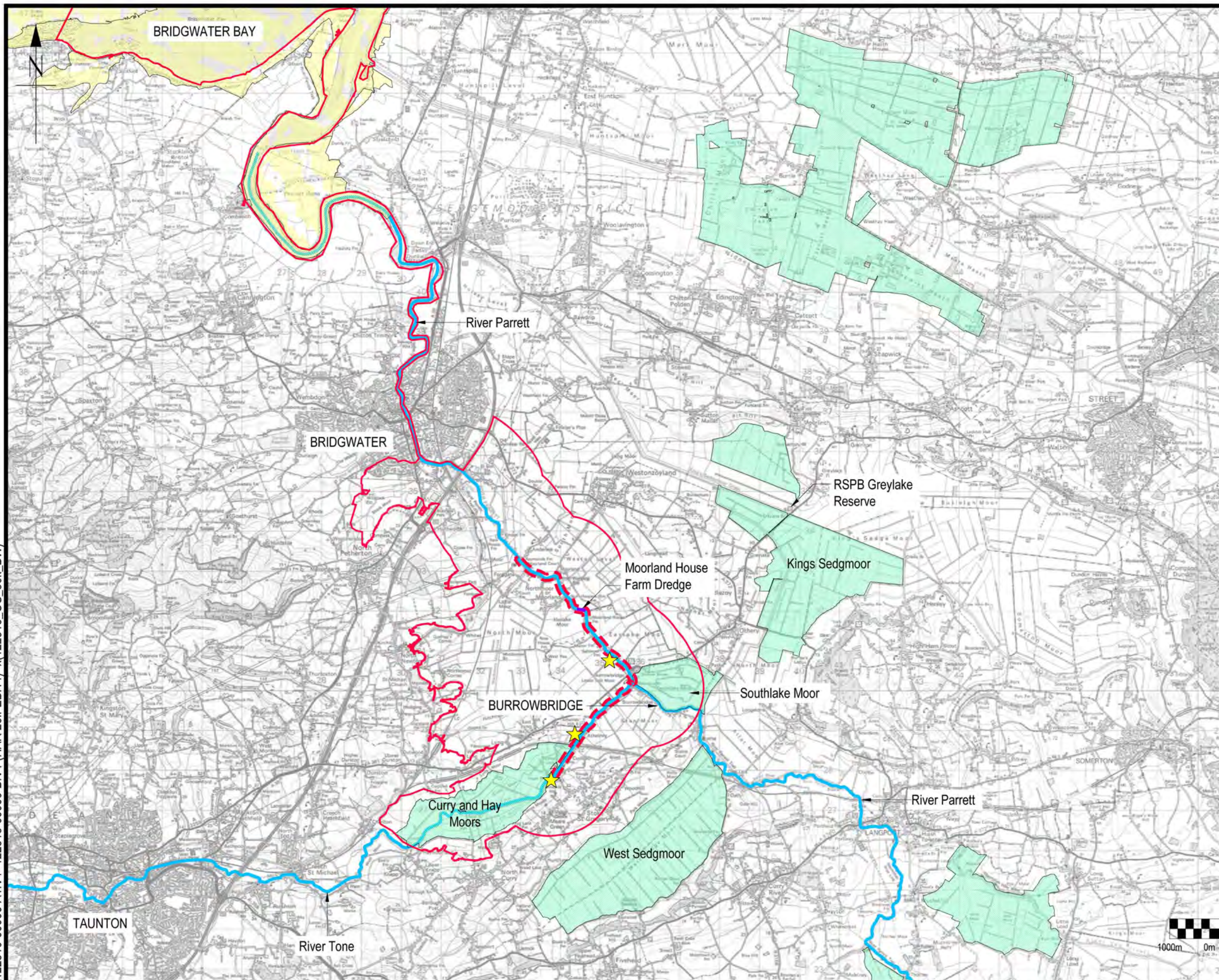


A GALLIFORD TRY,
BLACK & VEATCH
JOINT VENTURE

T E C H N I C A L N O T E

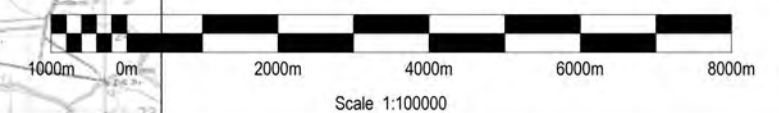
Annex A: Drawings

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- Legend**
- Rivers Parrett and Tone
 - Proposed dredging extent
 - Moorland House Farm Dredge
 - Extent of environmental study area
 - Proposed welfare facilities in Environment Agency Pumping Stations
 - Somerset Levels and Moors Natura 2000 Site (Special Protection Area, Ramsar)
 - Severn Estuary Natura 2000 Site (Special Area of Conservation, Special Protection Area, Ramsar)



Note : The scale ratios defined in this drawing apply when printed at A3-size only

Rev.	Nature of revision	Drawn	Check	Review	Approved	Date	Approved:	EST	21.FEB.14
B	FINAL ISSUE	HAR	ABu	ABu	EST	26FEB14	Checked:	ABu	21.FEB.14
A	FOR INCLUSION IN REPORT	HAR	ABu	ABu	EST	21FEB14	Reviewed:	ABu	21.FEB.14
							Drawn:	HAR	21.FEB.14


RIVERS PARRETT AND TONE DREDGE

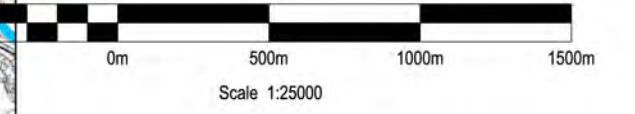
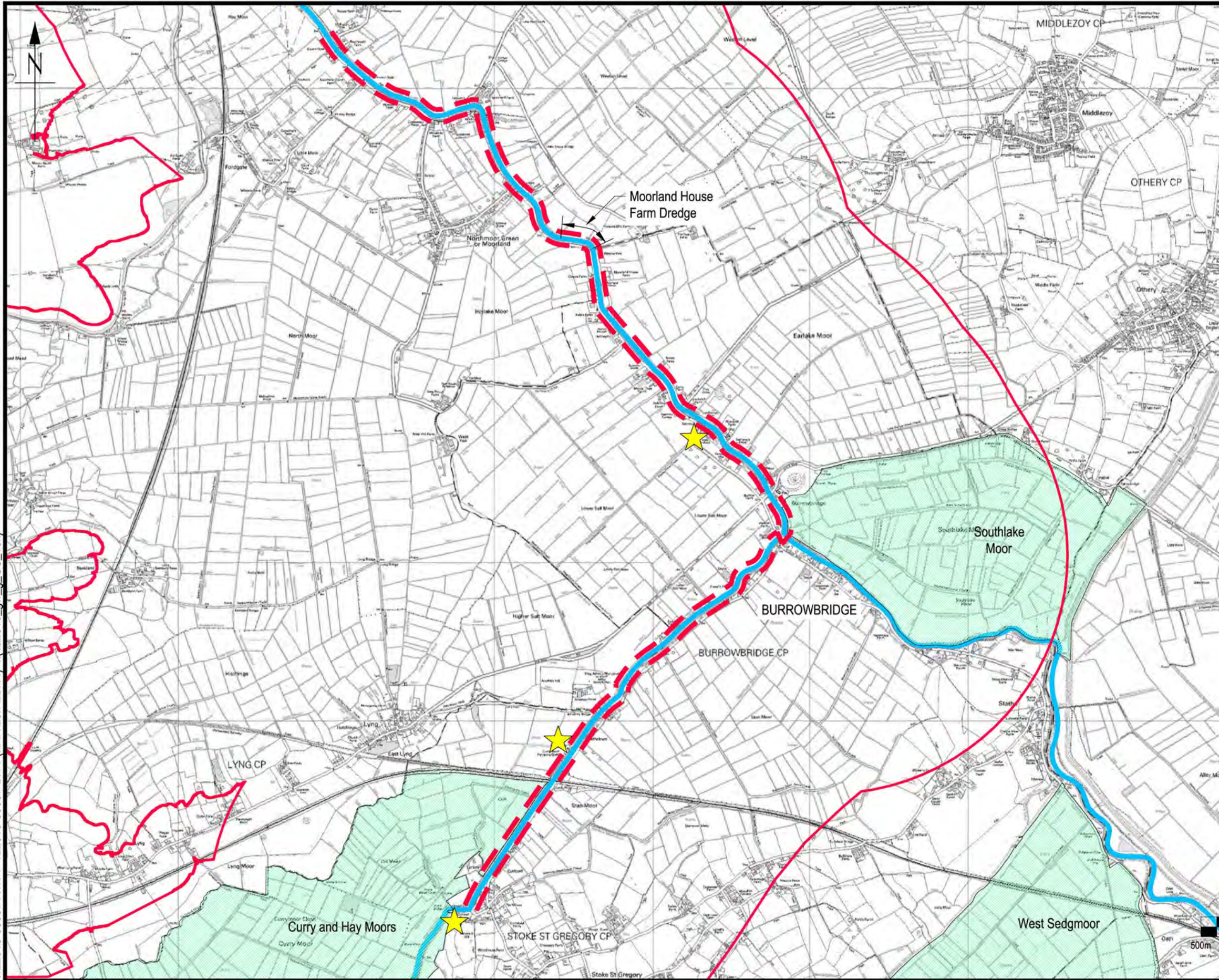
LOCATION OF NATURA 2000 SITES



Drawing no.
122316 - 00006

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- Legend**
-  Rivers Parrett and Tone
 -  Proposed dredging extent
 -  Environmental study area extents
 -  Moorland House Farm Dredge
 -  Proposed welfare facilities in Environment Agency pumping stations
 -  Somerset Levels and Moors Natura 2000 Site (Special Protection Area, Ramsar)



122308150150.0200150.0201122316-00007-A.1.V1>122316-00007-B.V1 (HAR.26.FEB.14)-x(122316_gw_g_OS_10k)



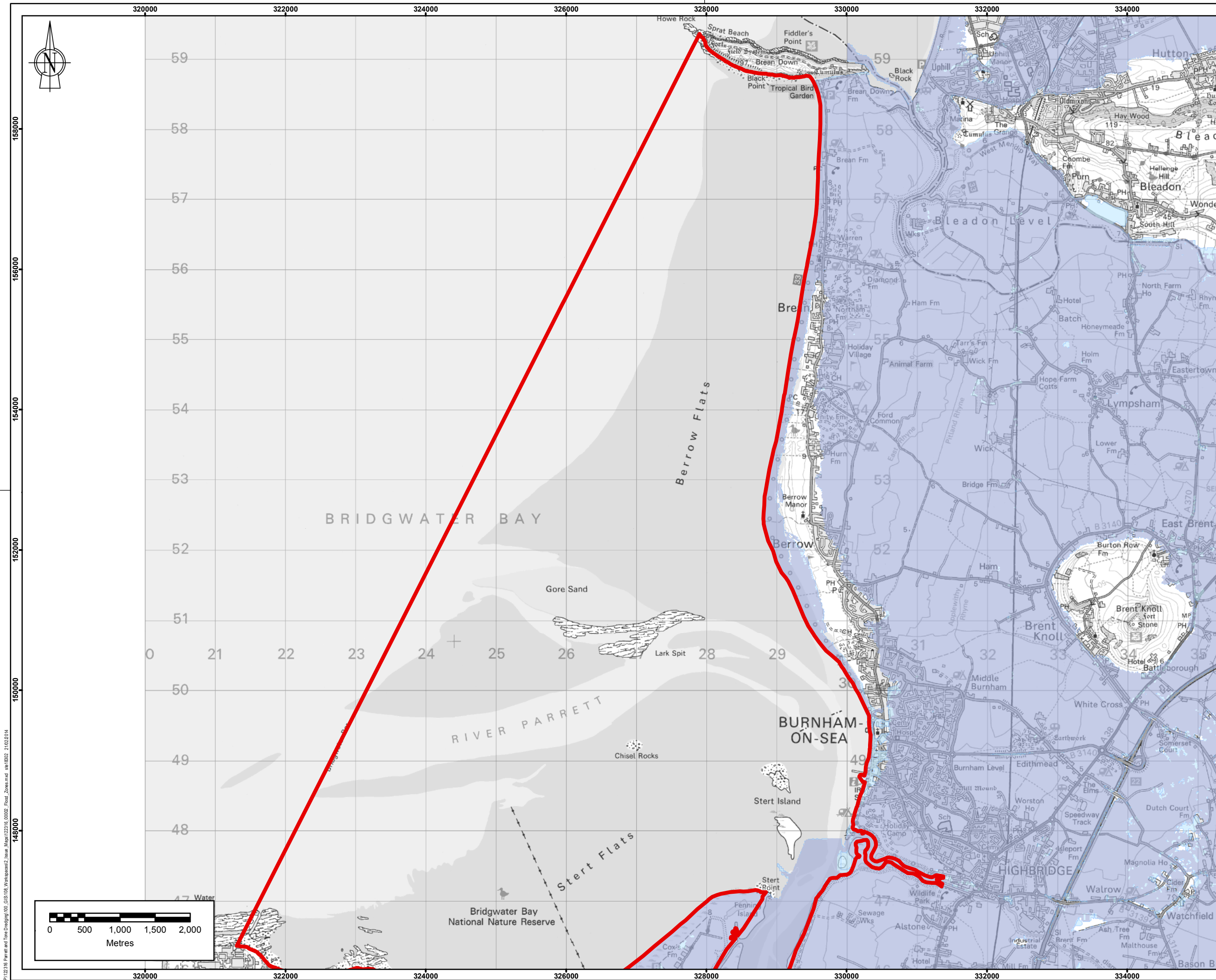
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Rev.	Nature of revision	Drawn	Check	Review	Approved	Date	Approved:	EST	21.FEB.14
B	FINAL ISSUE	HAR	ABu	ABu	EST	26FEB14	Checked:	ABu	21.FEB.14
A	FOR INCLUSION IN REPORT	HAR	ABu	ABu	EST	21FEB14	Reviewed:	ABu	21.FEB.14
							Drawn:	HAR	21.FEB.14

PARRETT AND TONE DREDGE
NATURA 2000 SITES IN RELATION TO DREDGING AREA








Drawing no. 122316 - 00007



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- Legend:**
-  Study Area
 -  Watercourse to be dredged
 -  Area benefiting from works
 -  Flood Zone 2
 -  Flood Zone 3



A0	ONV	AJS	KQ	EB	20/02/2014	FIRST ISSUE
Rev	Drawn	Chkd	Rwd	Apprvd	Date	Description

Designed by: AJS Date: FEB 2014



Client Drawing No. _____ Revision _____



Project: RIVERS PARRETT AND TONE DREDGE

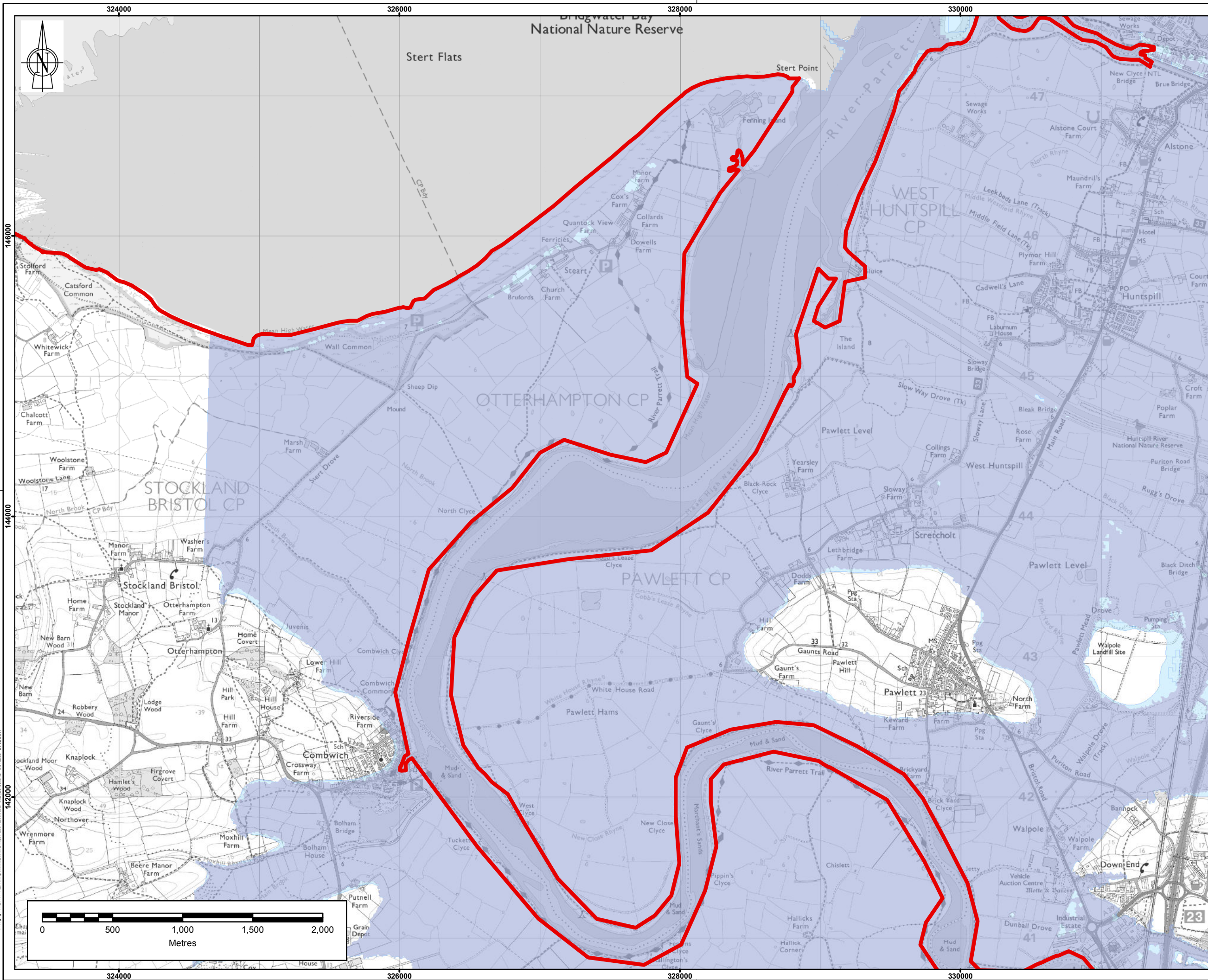
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SHEET 1 OF 5

Drawing scale: 1:50,000 @ A3 Sheet size: A3

Drawing no. 122316 - 00002 Revision A.0

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 - Watercourse to be dredged
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 - Flood Zone 2
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Rev	Drawn	Chkd	Rvwd	Apprvd	Date	Description

Designed by: AJS Date: FEB 2014



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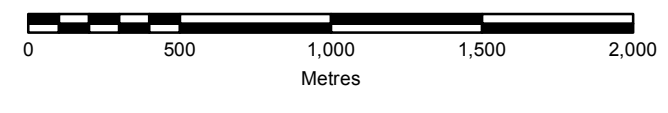
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RIVERS PARRETT AND TONE DREDGE

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FLOOD ZONES

SHEET 2 OF 5

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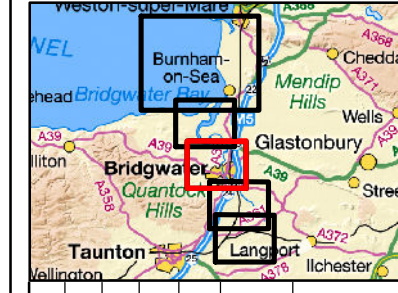
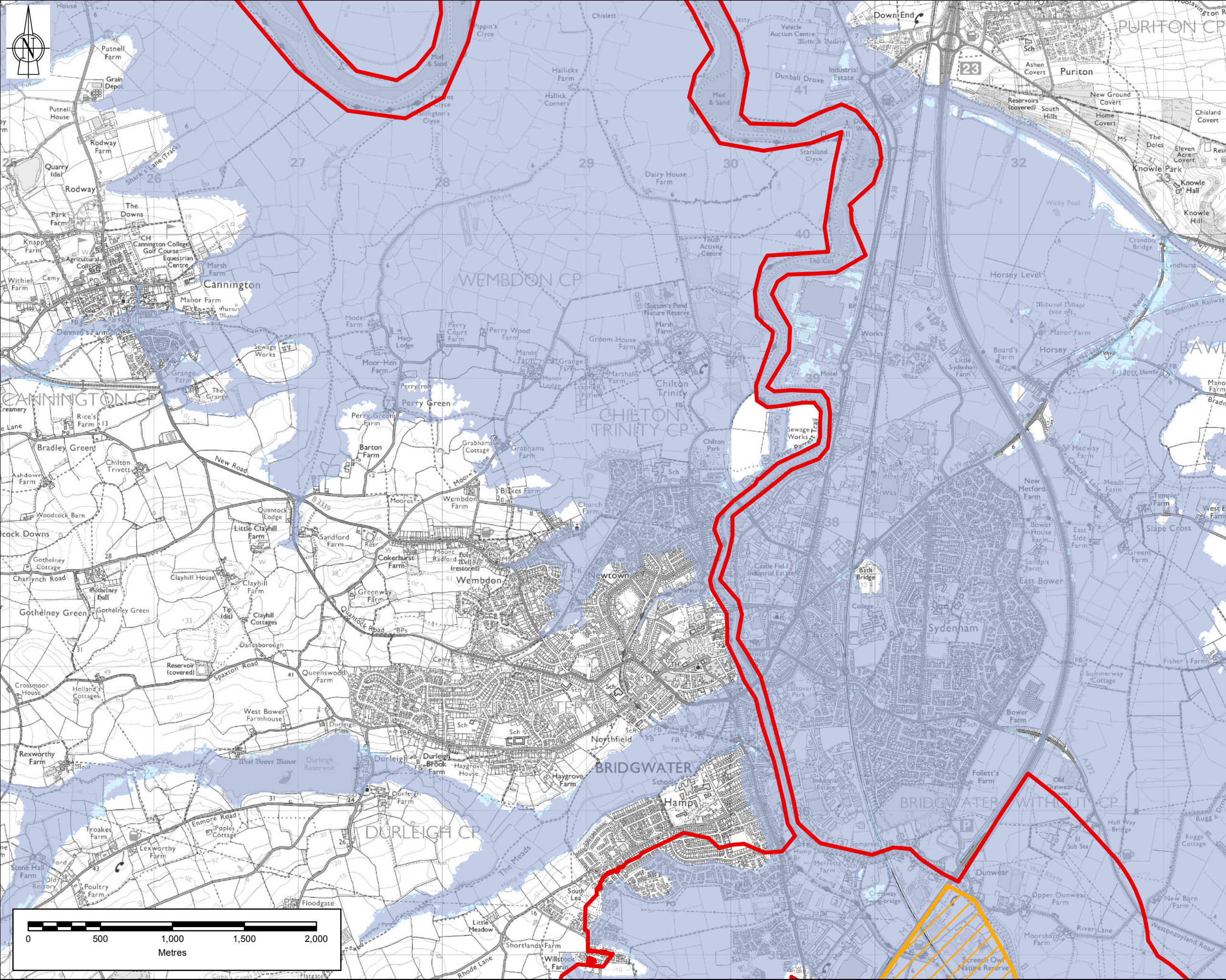
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- Legend:**
-  Study Area
 -  Watercourse to be dredged
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 -  Flood Zone 2
 -  Flood Zone 3



Rev	Drawn	Chkd	Rwtd	Apprvd	Date	Description
A0	ONV	AJS	KQ	EB	20/02/2014	FIRST ISSUE

Designed by: AJS Date: FEB 2014



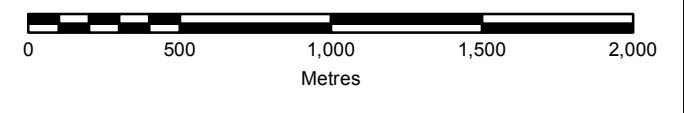
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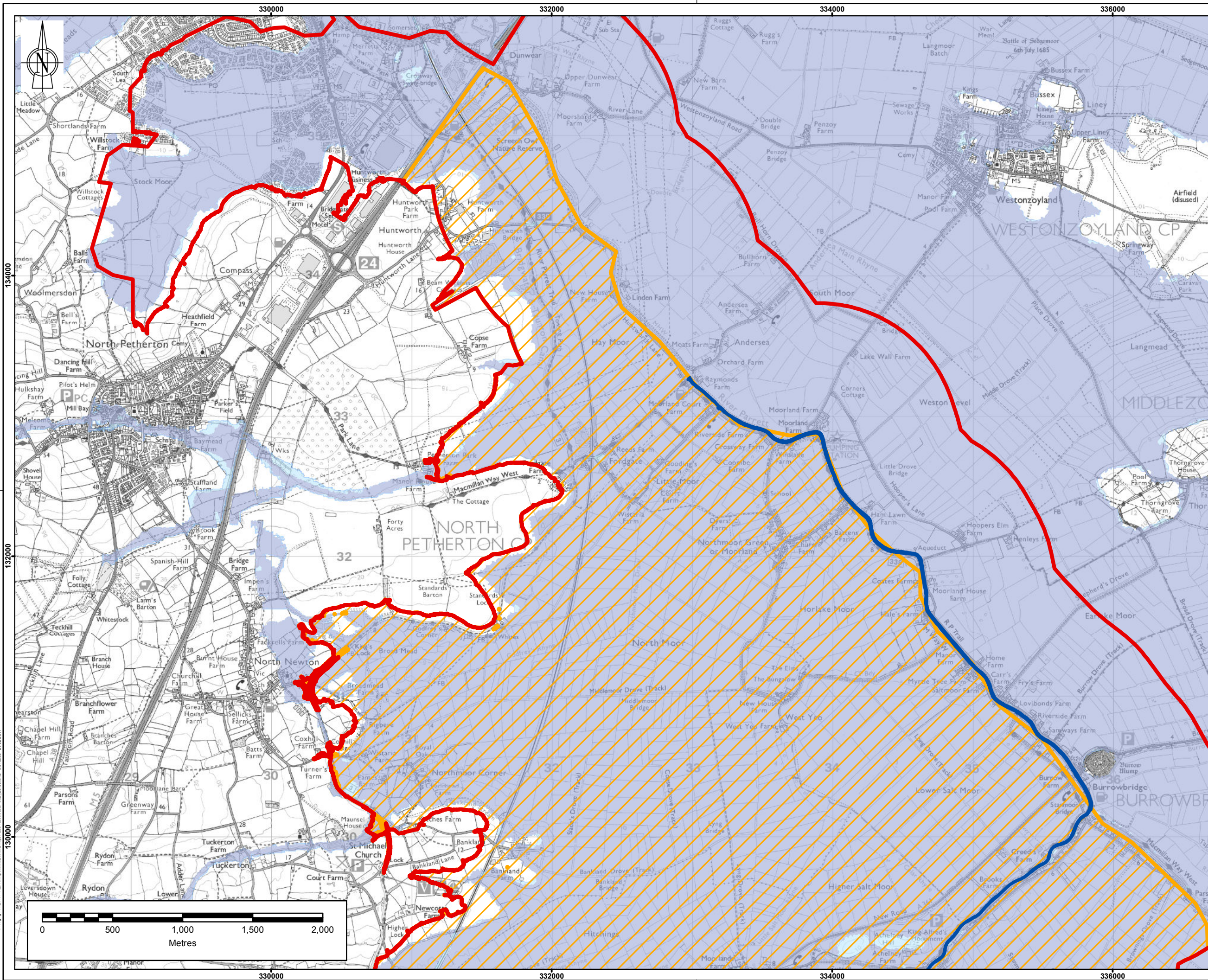
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Drawing title: **FLOOD ZONES**
SHEET 3 OF 5

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Drawing no. 122316 - 00002 Revision A.0



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- Legend:**
- Study Area
 - Watercourse to be dredged
 - Area benefiting from works
 - Flood Zone 2
 - Flood Zone 3



A0	ONV	AJS	KQ	EB	20/02/2014	FIRST ISSUE
Rev	Drawn	Chkd	Rwd	Apprvd	Date	Description

Designed by: AJS Date: FEB 2014



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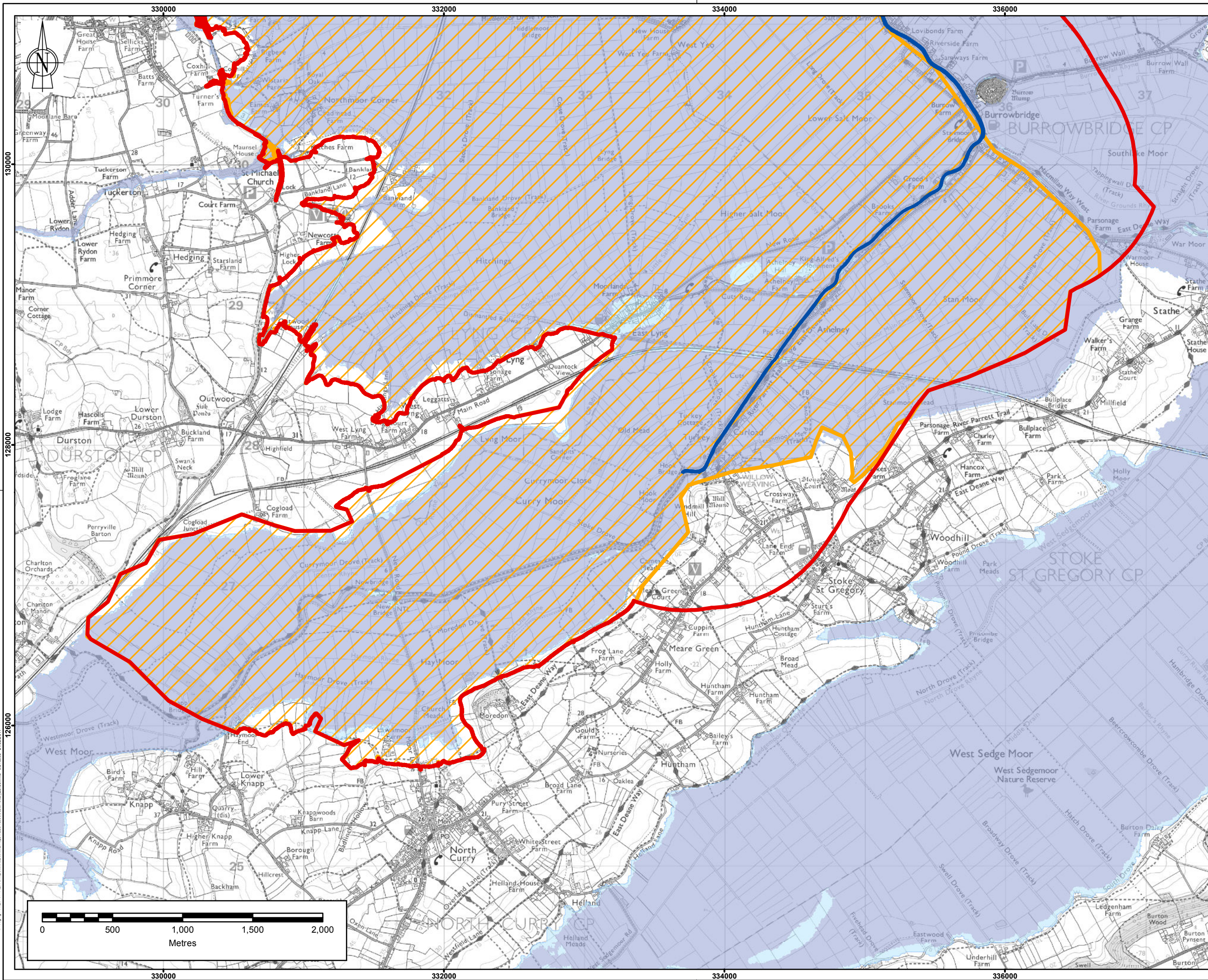
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Drawing title: **FLOOD ZONES**

SHEET 4 OF 5

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- Legend:**
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Rev	Drawn	Chkd	Rwd	Apprvd	Date	Description

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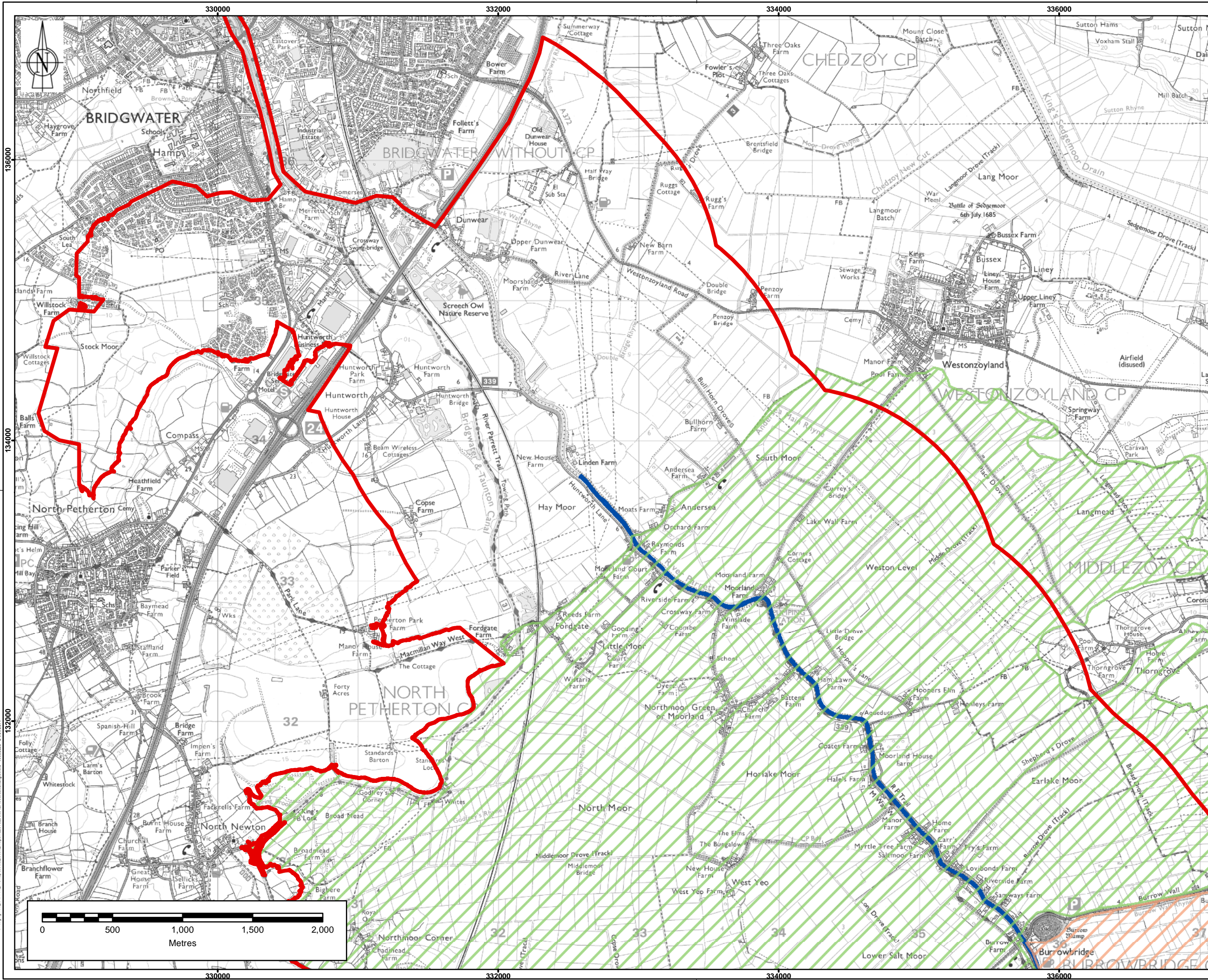
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SHEET 5 OF 5

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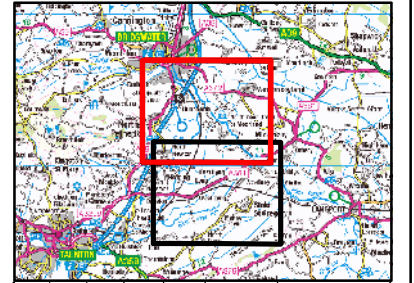
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- Legend**
- Areas likely to experience increased flood risk from tidal overtopping as a result of bank profile restoration
 - Areas benefitting from reduction in flood risk as a result of bank profile restoration
 - Study Area
 - Watercourse to be dredged



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Designed by: ONV Date: JUL 2014



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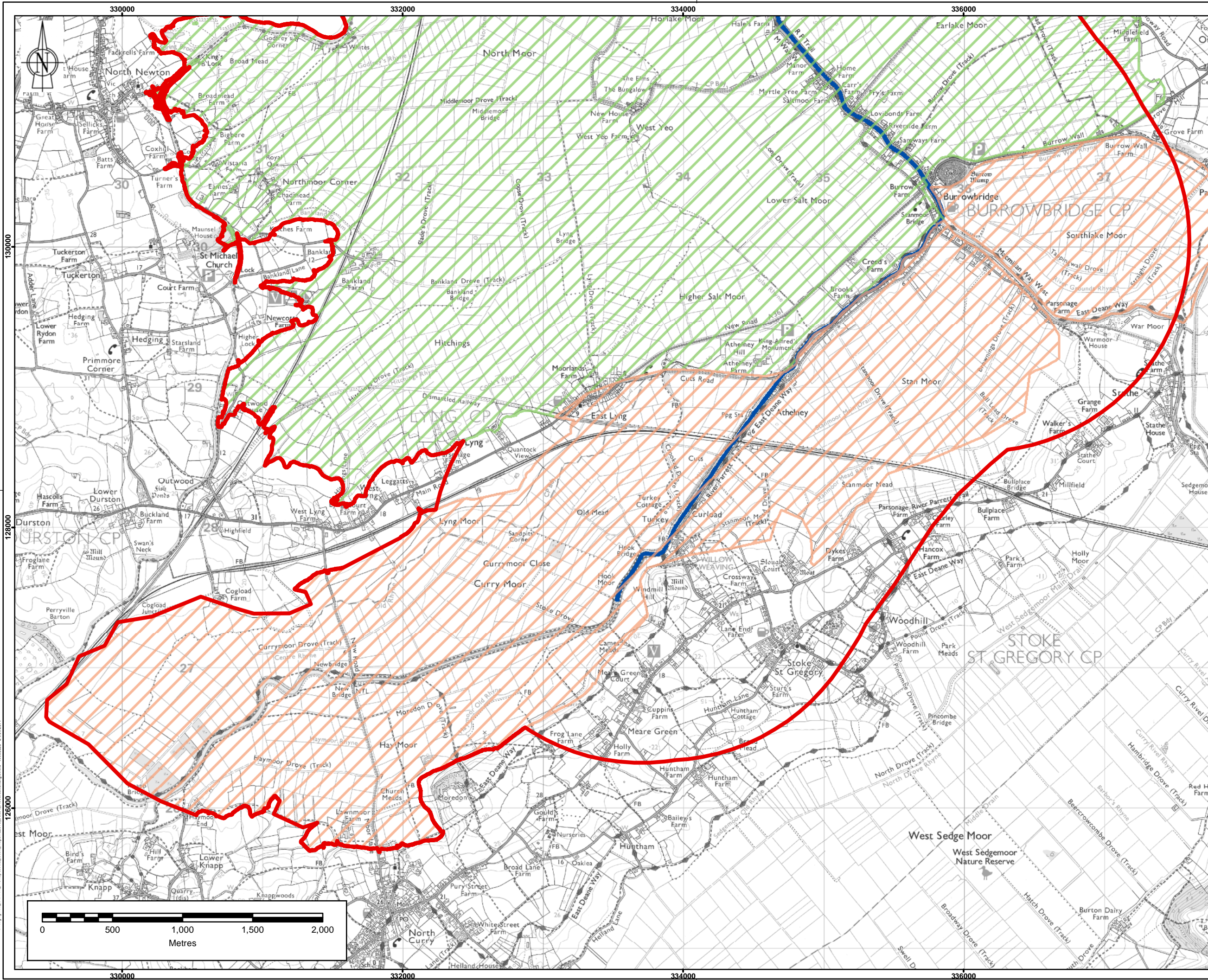


RIVERS PARETT AND TONE DREDGE

CHANGE IN FLOOD RISK RESULTING FROM BANK PROFILE RESTORATION WORKS SHEET 1 OF 2

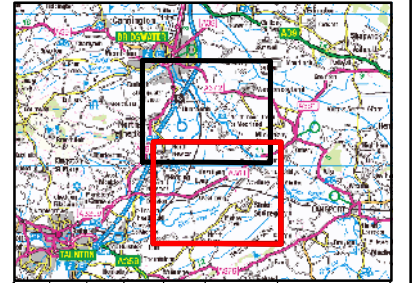
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- Legend**
- Areas likely to experience increased flood risk from tidal overtopping as a result of bank profile restoration
 - Areas benefitting from reduction in flood risk as a result of bank profile restoration
 - Study Area
 - Watercourse to be dredged



A0	ONV	KO	AW	ES	21/07/2014	FIRST ISSUE
Rev	Drawn	Chkd	Rvwd	Apprvd	Date	Description

Designed by: ONV Date: JUL 2014



Client Drawing No. _____ Revision _____



Project: **RIVERS PARRETT AND TONE DREDGE**

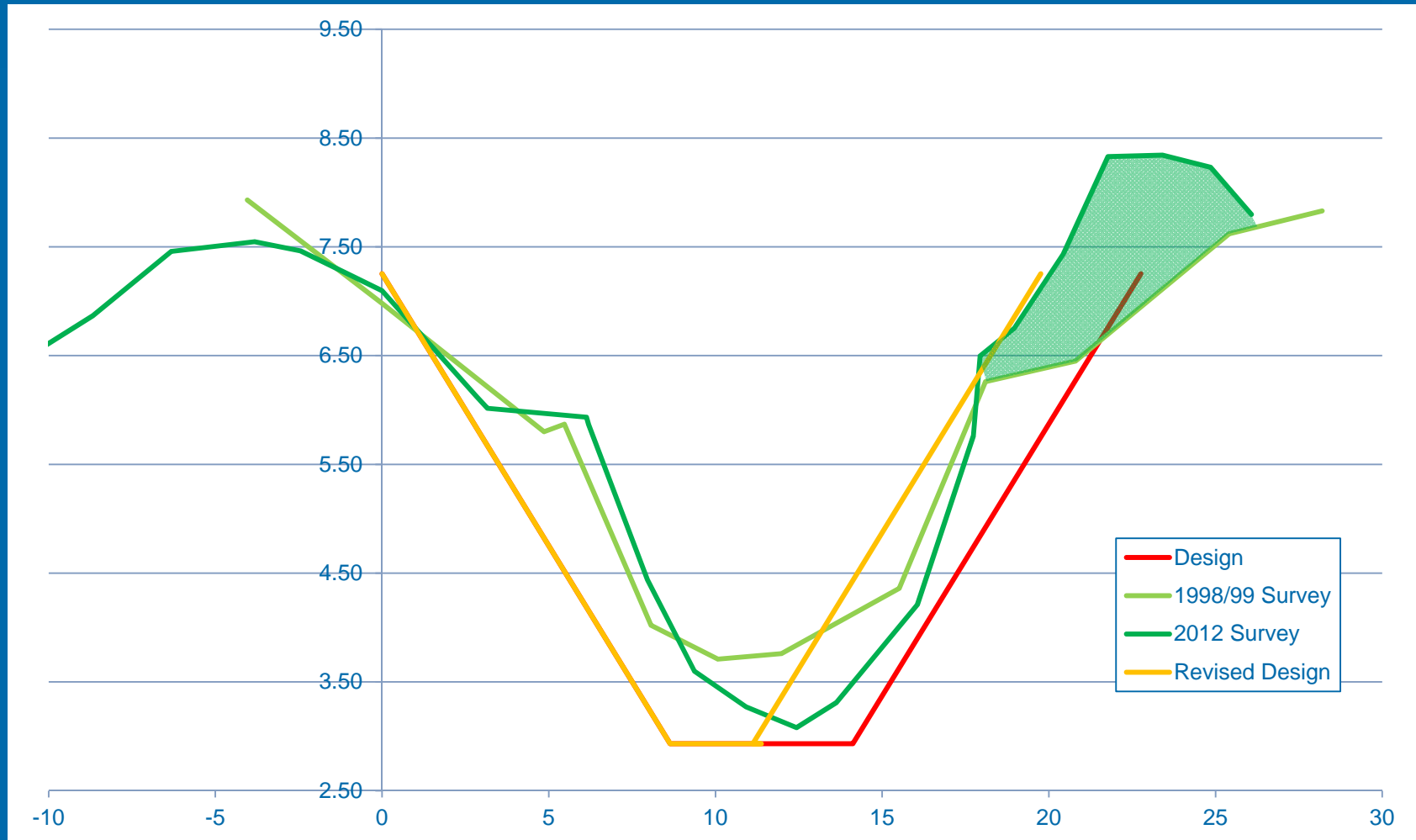
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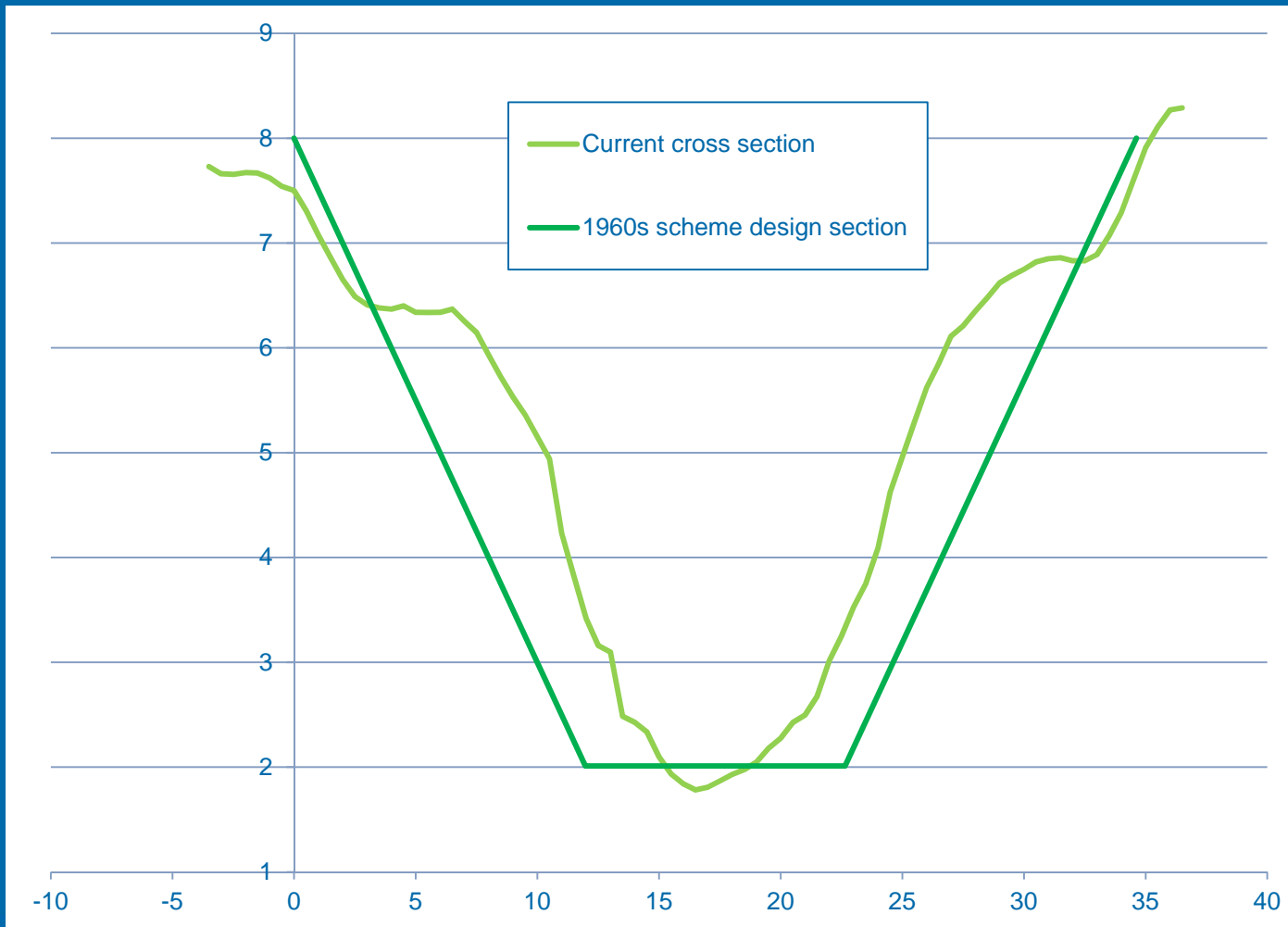
Annex B: River Parrett and River Tone cross-sections

Dredging sections - Tone



Stanmore Bank section: Green infill symbolises the Stanmoor Bank scheme. Reduces widening on right bank by between 5 and 20% to avoid destabilisation of Stanmoor Bank scheme through dredging. Majority of dredging length does not have this restriction.

Dredging sections - Parrett



Annex C: Natura 2000 Site citations and conservation objectives

NATURA 2000

STANDARD DATA FORM

FOR SPECIAL PROTECTION AREAS (SPA)
FOR SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE (SCI)
AND
FOR SPECIAL AREAS OF CONSERVATION (SAC)

1. Site identification:

1.1 Type 1.2 Site code

1.3 Compilation date 1.4 Update

1.5 Relationship with other Natura 2000 sites

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------

1.6 Respondent(s)

1.7 Site name

1.8 Site indication and designation classification dates

date site proposed as eligible as SCI	
date confirmed as SCI	
date site classified as SPA	199706
date site designated as SAC	

2. Site location:

2.1 Site centre location

longitude	latitude
02 52 00 W	51 10 14 N

2.2 Site area (ha) 2.3 Site length (km)

2.5 Administrative region

NUTS code	Region name	% cover
UK632	Somerset	100.00%

2.6 Biogeographic region

Alpine

Atlantic

Boreal

Continental

Macaronesia

Mediterranean

3. Ecological information:

3.1 Annex I habitats

Habitat types present on the site and the site assessment for them:

Annex I habitat	% cover	Representativity	Relative surface	Conservation status	Global assessment

3.2 Annex I birds and regularly occurring migratory birds not listed on Annex I

Code	Species name	Population			Site assessment			
		Resident	Migratory		Population	Conservation	Isolation	Global
Breed	Winter	Stage						
A052	<i>Anas crecca</i>		13307 I		B		C	
A037	<i>Cygnus columbianus bewickii</i>		191 I		B		B	
A140	<i>Pluvialis apricaria</i>		3029 I		C		C	
A142	<i>Vanellus vanellus</i>		36316 I		B		C	

4. Site description:

4.1 General site character

Habitat classes	% cover
Marine areas. Sea inlets	
Tidal rivers. Estuaries. Mud flats. Sand flats. Lagoons (including saltwork basins)	
Salt marshes. Salt pastures. Salt steppes	
Coastal sand dunes. Sand beaches. Machair	
Shingle. Sea cliffs. Islets	
Inland water bodies (standing water, running water)	5.0
Bogs. Marshes. Water fringed vegetation. Fens	5.0
Heath. Scrub. Maquis and garrigue. Phygrana	
Dry grassland. Steppes	
Humid grassland. Mesophile grassland	52.0
Alpine and sub-alpine grassland	
Improved grassland	26.0
Other arable land	1.0
Broad-leaved deciduous woodland	4.0
Coniferous woodland	
Evergreen woodland	
Mixed woodland	
Non-forest areas cultivated with woody plants (including orchards, groves, vineyards, dehesas)	2.0
Inland rocks. Scree. Sands. Permanent snow and ice	
Other land (including towns, villages, roads, waste places, mines, industrial sites)	5.0
Total habitat cover	100%

4.1 Other site characteristics

Soil & geology:

Alluvium, Clay, Neutral, Peat

Geomorphology & landscape:

Floodplain, Lowland

4.2 Quality and importance

ARTICLE 4.1 QUALIFICATION (79/409/EEC)

Over winter the area regularly supports:

Cygnus columbianus bewickii
(Western Siberia/North-eastern & North-western Europe) 2.7% of the GB population
5 year peak mean 1991/92-1995/96

Pluvialis apricaria
(North-western Europe - breeding) 1.2% of the GB population
5 year peak mean 1991/92-1995/96

ARTICLE 4.2 QUALIFICATION (79/409/EEC)

Over winter the area regularly supports:

Anas crecca 3.3% of the population
(North-western Europe) 5 year peak mean 1991/92-1995/96

Vanellus vanellus 0.5% of the population
(Europe - breeding) 5 year peak mean 1991/92-1995/96

ARTICLE 4.2 QUALIFICATION (79/409/EEC): AN INTERNATIONALLY IMPORTANT ASSEMBLAGE OF BIRDS

Over winter the area regularly supports:

73014 waterfowl (5 year peak mean 01/04/1998)

Including:

Cygnus columbianus bewickii , *Anas crecca* , *Pluvialis apricaria* , *Vanellus vanellus* .

4.3 Vulnerability

The site lies within the flood plains of a number of large rivers and drains with many areas below high tide levels. Peat extraction occurs over part of the site. This is not currently thought to pose a risk, and future extraction will be subject to controls under the Habitats Regulations. The majority of land is farmed and under private ownership. Most farms have dairy or beef herds. Trends in agriculture and support schemes have a critical influence as improvement with conversion of grassland to arable, land drainage, increased applications of inorganic fertilisers and cutting of silage are major threats to vulnerable peat soils and the nature conservation value of the site. Less intensive practices are encouraged through the ESA scheme, WES and Section 15 agreements. Water Level Management is critical and is being addressed through the Water Level Management Plans process and the development of Raised Water Level Areas and Environmentally Sensitive Area (ESA).

5. Site protection status and relation with CORINE biotopes:

5.1 Designation types at national and regional level

Code	% cover
UK01 (NNR)	11.9
UK04 (SSSI/ASSI)	100.0

Information Sheet on Ramsar Wetlands (RIS)

Categories approved by Recommendation 4.7 (1990), as amended by Resolution VIII.13 of the 8th Conference of the Contracting Parties (2002) and Resolutions IX.1 Annex B, IX.6, IX.21 and IX. 22 of the 9th Conference of the Contracting Parties (2005).

Notes for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.
2. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 7, 2nd edition, as amended by COP9 Resolution IX.1 Annex B). A 3rd edition of the Handbook, incorporating these amendments, is in preparation and will be available in 2006.
3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

1. Name and address of the compiler of this form:

Joint Nature Conservation Committee

Monkstone House

City Road

Peterborough

Cambridgeshire PE1 1JY

UK

Telephone/Fax: +44 (0)1733 – 562 626 / +44 (0)1733 – 555 948

Email: RIS@JNCC.gov.uk

FOR OFFICE USE ONLY.

DD MM YY

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Designation date

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Site Reference Number

2. Date this sheet was completed/updated:

Designated: 26 June 1997

3. Country:

UK (England)

4. Name of the Ramsar site:

Somerset Levels and Moors

5. Designation of new Ramsar site or update of existing site:

This RIS is for: Updated information on an existing Ramsar site

6. For RIS updates only, changes to the site since its designation or earlier update:

a) Site boundary and area:

** Important note: If the boundary and/or area of the designated site is being restricted/reduced, the Contracting Party should have followed the procedures established by the Conference of the Parties in the Annex to COP9 Resolution IX.6 and provided a report in line with paragraph 28 of that Annex, prior to the submission of an updated RIS.

b) Describe briefly any major changes to the ecological character of the Ramsar site, including in the application of the Criteria, since the previous RIS for the site:

7. Map of site included:

Refer to Annex III of the *Explanatory Notes and Guidelines*, for detailed guidance on provision of suitable maps, including digital maps.

a) A map of the site, with clearly delineated boundaries, is included as:

- i) **hard copy** (required for inclusion of site in the Ramsar List): *yes* ✓ -or- *no* ☐;
- ii) **an electronic format** (e.g. a JPEG or ArcView image) *Yes*
- iii) **a GIS file providing geo-referenced site boundary vectors and attribute tables** *yes* ✓ -or- *no* ☐;

b) Describe briefly the type of boundary delineation applied:

e.g. the boundary is the same as an existing protected area (nature reserve, national park etc.), or follows a catchment boundary, or follows a geopolitical boundary such as a local government jurisdiction, follows physical boundaries such as roads, follows the shoreline of a waterbody, etc.

The site boundary is the same as, or falls within, an existing protected area.

For precise boundary details, please refer to paper map provided at designation

8. Geographical coordinates (latitude/longitude):

51 10 14 N 02 52 00 W

9. General location:

Include in which part of the country and which large administrative region(s), and the location of the nearest large town.

Nearest town/city: Weston-super-Mare

The Somerset Levels and Moors Ramsar site is bounded by Bridgwater Bay in the west and the higher ground of the Mendips, Dorset Hills, Blackdown Hills, Brendons and Quantocks

Administrative region: North Somerset; Somerset

10. Elevation (average and/or max. & min.) (metres): **11. Area** (hectares): 6388.49

Min.	2
Max.	9
Mean	4

12. General overview of the site:

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

The Ramsar site consists of a series of Sites of Special Scientific Interest (SSSI) within the largest area of lowland wet grassland and associated wetland habitat remaining in Britain. It covers about 35,000 ha in the flood plains of the Rivers Axe, Brue, Parrett, Tone and their tributaries. The majority of the site is only a few metres above mean sea level and drains through a large network of ditches, rhynes, drains and rivers. Flooding may affect large areas in winter depending on rainfall and tidal conditions. Parts of the site in the Brue Valley include areas of former raised peat bog which have now been substantially modified by agricultural improvement and peat extraction which has created areas of open water, fen and reedbed.

The site attracts internationally important numbers of wildfowl in winter and is one of the most important sites in southern Britain for breeding waders. The network of rhynes and ditches support an outstanding assemblage of aquatic invertebrates, particularly beetles.

13. Ramsar Criteria:

Circle or underline each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11).

2, 5, 6

14. Justification for the application of each Criterion listed in 13 above:

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

Ramsar criterion 2

Supports 17 species of British Red Data Book invertebrates.

Ramsar criterion 5

Assemblages of international importance:

Species with peak counts in winter:

97155 waterfowl (5 year peak mean 1998/99-2002/2003)

Ramsar criterion 6 – species/populations occurring at levels of international importance.

Qualifying Species/populations (as identified at designation):

Species with peak counts in winter:

Tundra swan , <i>Cygnus columbianus bewickii</i> , NW Europe	112 individuals, representing an average of 1.3% of the GB population (5 year peak mean 1998/9-2002/3)
Eurasian teal , <i>Anas crecca</i> , NW Europe	21231 individuals, representing an average of 5.3% of the population (5 year peak mean 1998/9-2002/3)
Northern lapwing , <i>Vanellus vanellus</i> , Europe - breeding	36580 individuals, representing an average of 1% of the population (5 year peak mean 1998/9-2002/3)

Species/populations identified subsequent to designation for possible future consideration under criterion 6.

Species with peak counts in winter:

Mute swan , <i>Cygnus olor</i> , Britain	842 individuals, representing an average of 2.2% of the population (5 year peak mean 1998/9-2002/3)
Eurasian wigeon , <i>Anas penelope</i> , NW Europe	25759 individuals, representing an average of 1.7% of the population (5 year peak mean 1998/9-2002/3)
Northern pintail , <i>Anas acuta</i> , NW Europe	927 individuals, representing an average of 1.5% of the population (5 year peak mean 1998/9-2002/3)
Northern shoveler , <i>Anas clypeata</i> , NW & C Europe	1094 individuals, representing an average of 2.7% of the population (5 year peak mean 1998/9-2002/3)

Contemporary data and information on waterbird trends at this site and their regional (sub-national) and national contexts can be found in the Wetland Bird Survey report, which is updated annually. See www.bto.org/survey/webs/webs-alerts-index.htm.

Details of bird species occurring at levels of National importance are given in Section 22

15. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) biogeographic region:

Atlantic

b) biogeographic regionalisation scheme (include reference citation):

Council Directive 92/43/EEC

16. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Soil & geology	acidic, basic, neutral, clay, alluvium, peat
Geomorphology and landscape	lowland, floodplain
Nutrient status	eutrophic
pH	acidic, circumneutral
Salinity	fresh
Soil	mainly organic
Water permanence	usually seasonal / intermittent
Summary of main climatic features	Annual averages (Cardiff, 1971–2000) (www.metoffice.com/climate/uk/averages/19712000/sites/cardiff.html) Max. daily temperature: 14.3° C Min. daily temperature: 6.8° C Days of air frost: 33.0 Rainfall: 1111.7 mm Hrs. of sunshine: 1518.0

General description of the Physical Features:

The Somerset Levels and Moors are one of the largest and richest areas of traditionally managed wet grassland and fen habitats in lowland UK. The majority of the site is only a few metres above mean sea level and drains through a large network of ditches, rhynes, drains and rivers. Flooding may affect large areas in winter depending on rainfall and tidal conditions. Parts of the site in the Brue Valley include areas of former raised peatbog that have now been substantially modified by agricultural intensification and peat extraction. This has created areas of open water, fen and reedbed.

17. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, general land use, and climate (including climate type).

The Somerset Levels and Moors are one of the largest and richest areas of traditionally managed wet grassland and fen habitats in lowland UK. The majority of the site is only a few metres above mean sea level and drains through a large network of ditches, rhynes, drains and rivers. Flooding may affect large areas in winter depending on rainfall and tidal conditions. Parts of the site in the Brue Valley include areas of former raised peatbog that have now been substantially modified by agricultural intensification and peat extraction. This has created areas of open water, fen and reedbed.

18. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

Flood water storage / desynchronisation of flood peaks, Maintenance of water quality (removal of nutrients)

19. Wetland types:

Inland wetland

Code	Name	% Area
4	Seasonally flooded agricultural land	85.1
U	Peatlands (including peat bogs swamps, fens)	5
O	Freshwater lakes: permanent	3
Other	Other	2.9
9	Canals and drainage channels	2
Xp	Forested peatland	2

20. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site, and the ecosystem services of the site and the benefits derived from them.

The majority of the site is dominated by open wet grassland and ditches with a range of plant communities: Species-poor grassland including the semi-improved grassland communities with perennial rye grass and naturally-occurring species-poor floodplain or inundation grassland communities (National Vegetation Classification communities (NVC) include MG13, MG6, MG7, MG10).

Species-rich fen meadows and flood pastures where agricultural improvement has been less intense with MG8 *Cynosurus cristatus*- *Caltha palustris* grassland with *Cirsium dissectum* and *Caltha palustris* and mire communities such as M23, M24 and M25 with more *Juncus* and *Carex* species.

Smaller areas of drier species-rich hay meadows (MG5) with *Centaurea nigra*, *Orchis morio* and *Briza media*.

In the rivers, rhynes and ditches the floristic diversity is largely dependent upon sympathetic cleaning practises. The field ditches support the greatest floristic diversity including the species; *Wolffia arrhiza*, *Hottonia palustris* and *Hydrocharis morsus-ranae*.

Other habitats include - withy beds, orchards and pollarded willows.

The remaining habitats are largely restricted to the SSSIs within the Bure Valley where areas of former raised bog have been modified by peat extraction and agricultural improvement.

Small areas of tall herb fen (S24) with *Lathyrus palustris*, *Peucedanum palustre* and *Thelypteris palustris* and small remnants of raised bogs which are very degraded and support vegetation more akin to wet heath with *Erica tetralix* and *Molinia caerulea*.

Open water, reed swamp and reedbed with a range of species from submerged plants to tall stands of *Phragmites australis* and *Typha latifolia* are found in the flooded peat workings.

Wet woodland where peat has been cut many years ago and dominated by *Salix* spp., *Betula* spp. and *Alnus glutinosa*.

Ecosystem services

21. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Nationally important species occurring on the site.

Higher Plants.

Althaea officinalis, *Persicaria laxiflora*, *Lathyrus palustris*, *Peucedanum palustre*, *Potamogeton coloratus*, *Potamogeton trichoides*, *Sium latifolium*, *Wolffia arrhiza*

22. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Birds

Species currently occurring at levels of national importance:

Species with peak counts in winter:

Gadwall , <i>Anas strepera strepera</i> , NW Europe	522 individuals, representing an average of 3% of the GB population (5 year peak mean 1998/9-2002/3)
Water rail , <i>Rallus aquaticus</i> , Europe	36 individuals, representing an average of 8% of the GB population (5 year peak mean 1998/9-2002/3)
European golden plover , <i>Pluvialis apricaria apricaria</i> , P. a. altifrons Iceland & Faroes/E Atlantic	3857 individuals, representing an average of 1.5% of the GB population (5 year peak mean 1998/9-2002/3)
Ruff , <i>Philomachus pugnax</i> , Europe/W Africa	16 individuals, representing an average of 2.2% of the GB population (5 year peak mean 1998/9-2002/3)
Common snipe , <i>Gallinago gallinago gallinago</i> , Europe -breeding	1633 individuals, representing an average of 1.6% of the GB population (5 year peak mean 1998/9-2002/3)

Species Information

Nationally important species occurring on the site.

Invertebrates.

Hydrochara caraboides, *Bagous nodulosus*, *Odontomyia angulata*, *Oulema erichsoni*, *Valvata macrostoma*, *Odontomyia ornata*, *Stethophyma grossum*, *Pteromicra leucopeza*, *Lejops vittata*, *Cantharis fusca*, *Paederus caligatus*, *Hydaticus transversalis*, *Dytiscus dimidiatus*, *Hydrophilus piceus*, *Limnebus aluta*, *Laccornis oblongus*

23. Social and cultural values:

Describe if the site has any general social and/or cultural values e.g. fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values.

- Aesthetic
- Aquatic vegetation (e.g. reeds, willows, seaweed)
- Archaeological/historical site
- Environmental education/ interpretation
- Livestock grazing
- Non-consumptive recreation
- Scientific research
- Sport fishing
- Tourism
- Traditional cultural

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning? **No**

If Yes, describe this importance under one or more of the following categories:

- i) sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:
- ii) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:
- iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:
- iv) sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

24. Land tenure/ownership:

Ownership category	On-site	Off-site
Non-governmental organisation (NGO)	+	
Local authority, municipality etc.	+	
National/Crown Estate	+	
Private	+	
Public/communal	+	

25. Current land (including water) use:

Activity	On-site	Off-site
Nature conservation	+	
Tourism	+	+
Recreation	+	+
Current scientific research	+	+
Collection of non-timber natural products: commercial	+	+
Commercial forestry	+	+

Cutting of vegetation (small-scale/subsistence)	+	+
Fishing: recreational/sport	+	+
Arable agriculture (unspecified)	+	+
Livestock watering hole/pond	+	+
Grazing (unspecified)	+	+
Permanent pastoral agriculture	+	+
Hay meadows	+	+
Hunting: recreational/sport	+	+
Industrial water supply		+
Flood control	+	+
Irrigation (incl. agricultural water supply)	+	+
Mining/quarrying	+	+
Transport route		+
Urban development		+
Non-urbanised settlements	+	

26. Factors (past, present or potential) adversely affecting the site’s ecological character, including changes in land (including water) use and development projects:

Explanation of reporting category:

1. Those factors that are still operating, but it is unclear if they are under control, as there is a lag in showing the management or regulatory regime to be successful.
2. Those factors that are not currently being managed, or where the regulatory regime appears to have been ineffective so far.

NA = Not Applicable because no factors have been reported.

Adverse Factor Category	Reporting Category	Description of the problem (Newly reported Factors only)	On-Site	Off-Site	Major Impact?
No factors reported	NA				

For category 2 factors only.

What measures have been taken / are planned / regulatory processes invoked, to mitigate the effect of these factors?

Is the site subject to adverse ecological change? NO

27. Conservation measures taken:

List national category and legal status of protected areas, including boundary relationships with the Ramsar site; management practices; whether an officially approved management plan exists and whether it is being implemented.

Conservation measure	On-site	Off-site
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Site/ Area of Special Scientific Interest (SSSI/ASSI)	+	
National Nature Reserve (NNR)	+	
Special Protection Area (SPA)	+	
Land owned by a non-governmental organisation for nature conservation	+	
Management agreement	+	
Site management statement/plan implemented	+	
Other	+	+

b) Describe any other current management practices:

The management of Ramsar sites in the UK is determined by either a formal management plan or through other management planning processes, and is overseen by the relevant statutory conservation agency. Details of the precise management practises are given in these documents.

28. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

No information available

29. Current scientific research and facilities:

e.g. details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

Fauna.

Numbers of migratory and wintering wildfowl and waders are monitored annually as part of the national Wetland Birds Survey (WeBS) organised by the British Trust for Ornithology, Wildfowl & Wetlands Trust, the Royal Society for the Protection of Birds and the Joint Nature Conservation Committee.

Separate surveys to assess bird populations in relation to the restoration of disused peat workings on Shapwick Heath SSSI.

Ditch fauna: repeat Levels and Moors wide surveys undertaken approximately every five years by EN.

Flora.

Ditch flora: repeat Levels and Moors wide surveys undertaken approximately every five years by EN.
Meadow flora: repeat surveys 4-5 year repeat surveys by EN.

Completed.

Fauna.

Analysis of most recent trends undertaken by RSPB 2002.

Breeding waders: Four most recent major collaborative surveys on Levels and Moors, 1992, 1995, 1997, 2004.

30. Current communications, education and public awareness (CEPA) activities related to or benefiting the site:

e.g. visitor centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

Existing programmes: Guided walks and school group visits are available to Shapwick National Nature Reserves. Somerset Wildlife Trust run their own programme of events on Westhay Moor SSSI and likewise the RSPB on West Sedgemoor SSSI. English Nature's team newsletter for farmers and landowners runs regular features about the site.

Interpretation facilities: Are available at the Peat Moors visitor centre adjacent to the Shapwick National Nature Reserve. Interpretation panels have been located around the Reserve where appropriate. SWT have provided interpretation boards on Westhay Moor SSSI.

31. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

Activities.

Controlled microlighting with few reported incidences of disturbance.

Wildfowling on a number of moors across the area although the affects of disturbance on the Ramsar is largely unknown and requires further work. Further work on disturbance to waterfowl has been undertaken for EN. Closer working between Wildflowing Clubs, BASC is ongoing.

Facilities provided.

Limited facilities for visitors to use the site except at NNRs in Brue Valley. General visitors and bird watchers at Shapwick National Nature Reserve, Westhay Moor and West Sedgemoor. Walking, including dog walking on droves, cycling, bird watching, coarse angling on the Main Drains may cause some limited disturbance to sites.

Seasonality.

All year.

32. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept. of Agriculture/Dept. of Environment, etc.

Head, Natura 2000 and Ramsar Team, Department for Environment, Food and Rural Affairs, European Wildlife Division, Zone 1/07, Temple Quay House, 2 The Square, Temple Quay, Bristol, BS1 6EB

33. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Site Designations Manager, English Nature, Sites and Surveillance Team, Northminster House, Northminster Road, Peterborough, PE1 1UA, UK

34. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see 15 above), list full reference citation for the scheme.

Site-relevant references

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- Wolseley, PA, Palmer, MA & Williams R (1984) The aquatic flora of the Somerset Levels and Moors. *Nature Conservancy Council, CSD Report*, No. 545

Please return to: **Ramsar Secretariat, Rue Mauverney 28, CH-1196 Gland, Switzerland**
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**European Site Conservation Objectives for
Somerset Levels and Moors Special Protection Area
Site Code: UK9010031**

With regard to the individual species and/or assemblage of species for which the site has been classified ('the Qualifying Features' listed below);

Avoid the deterioration of the habitats of the qualifying features, and the significant disturbance of the qualifying features, ensuring the integrity of the site is maintained and the site makes a full contribution to achieving the aims of the Birds Directive.

Subject to natural change, to maintain or restore:

- The extent and distribution of the habitats of the qualifying features;
- The structure and function of the habitats of the qualifying features;
- The supporting processes on which the habitats of the qualifying features rely;
- The populations of the qualifying features;
- The distribution of the qualifying features within the site.

Qualifying Features:

A037 *Cygnus columbianus bewickii*; Bewick's swan (Non-breeding)

A052 *Anas crecca*; Eurasian teal (Non-breeding)

A140 *Pluvialis apricaria*; European golden plover (Non-breeding)

A142 *Vanellus vanellus*; Northern lapwing (Non-breeding)

Waterbird assemblage

Additional Qualifying Features Identified by the 2001 UK SPA Review:

A050 *Anas penelope*; Eurasian wigeon (Non-breeding)

A056 *Anas clypeata*; Northern shoveler (Non-breeding)

Explanatory Notes: European Site Conservation Objectives

European Site Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2010 (the “Habitats Regulations”) and Article 6(3) of the Habitats Directive 1992. They are for use when either the appropriate nature conservation body or competent authority is required to make an Appropriate Assessment under the relevant parts of the respective legislation.

These conservation objectives are set for each bird feature for a [Special Protection Area \(SPA\)](#). Where the objectives are met, the site can be said to demonstrate a high degree of integrity and the site itself makes a full contribution to achieving the aims of the Birds Directive for those features. On the first page of this document there may be a list of ‘Additional Qualifying Features identified by the 2001 UK SPA Review’. These are additional features identified by the UK SPA Review published in 2001 and, although not yet legally classified, are as a matter of Government policy treated in the same way as classified features.

This document is also intended for those who are preparing information to be used for an appropriate assessment by either the appropriate nature conservation body or a competent authority. As such this document cannot be definitive in how the impacts of a project can be determined. Links to selected sources of information, data and guidance which may be helpful can be found on Natural England’s website. This list is far from exhaustive.

NATURA 2000

STANDARD DATA FORM

FOR SPECIAL PROTECTION AREAS (SPA)
FOR SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE (SCI)
AND
FOR SPECIAL AREAS OF CONSERVATION (SAC)

1. Site identification:

1.1 Type

K

1.2 Site code

UK0013030

1.3 Compilation date

200708

1.4 Update

1.5 Relationship with other Natura 2000 sites

U | K | 9 | 0 | 1 | 5 | 0 | 2 | 2

1.6 Respondent(s)

International Designations, JNCC, Peterborough

1.7 Site name

Severn Estuary/ Môr Hafren

1.8 Site indication and designation classification dates

date site proposed as eligible as SCI	200708
date confirmed as SCI	200812
date site classified as SPA	
date site designated as SAC	201012

2. Site location:

2.1 Site centre location

longitude

latitude

02 58 41 W

51 28 07 N

2.2 Site area (ha)

73715.4

2.3 Site length (km)

2.5 Administrative region

NUTS code	Region name	% cover
UKL22	Cardiff and Vale of Glamorgan	1.02%
UKL21	Monmouthshire and Newport	8.39%
UKK13	Gloucestershire	6.10%
UKK11	Bristol, City of	16.92%
UKK12	North and North East Somerset, South Gloucestershire	8.12%
UKK23	Somerset	7.27%
0	Marine	52.18%

2.6 Biogeographic region

Alpine

Atlantic

Boreal

Continental

Macaronesia

Mediterranean

3. Ecological information:

3.1 Annex I habitats

Habitat types present on the site and the site assessment for them:

Annex I habitat	% cover	Representativity	Relative surface	Conservation status	Global assessment
Sandbanks which are slightly covered by sea water all the time	15.98	C	C	B	C
Estuaries	99.95	A	A	B	B
Mudflats and sandflats not covered by seawater at low tide	27.5	A	B	B	B
Reefs	2	C	C	A	C
<i>Salicornia</i> and other annuals colonising mud and sand	0	D			
<i>Spartina</i> swards (<i>Spartinion maritimae</i>)	0.26	D			
Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)	0.89	A	B	B	A
Embryonic shifting dunes	0	D			

3.2 Annex II species

Species name	Population				Site assessment			
	Resident	Migratory			Population	Conservation	Isolation	Global
		Breed	Winter	Stage				
<i>Petromyzon marinus</i>	Common	-	-	-	C	A	C	B
<i>Lampetra fluviatilis</i>	Common	-	-	-	C	B	C	B
<i>Alosa alosa</i>	Very rare	-	-	-	D			
<i>Alosa fallax</i>	Common	-	-	-	A	B	C	A

4. Site description

4.1 General site character

Habitat classes	% cover
Marine areas. Sea inlets	
Tidal rivers. Estuaries. Mud flats. Sand flats. Lagoons (including saltwork basins)	99.0
Salt marshes. Salt pastures. Salt steppes	1.0
Coastal sand dunes. Sand beaches. Machair	
Shingle. Sea cliffs. Islets	
Inland water bodies (standing water, running water)	
Bogs. Marshes. Water fringed vegetation. Fens	
Heath. Scrub. Maquis and garrigue. Phygrana	
Dry grassland. Steppes	
Humid grassland. Mesophile grassland	
Alpine and sub-alpine grassland	
Improved grassland	
Other arable land	
Broad-leaved deciduous woodland	
Coniferous woodland	
Evergreen woodland	
Mixed woodland	
Non-forest areas cultivated with woody plants (including orchards, groves, vineyards, dehesas)	
Inland rocks. Screes. Sands. Permanent snow and ice	
Other land (including towns, villages, roads, waste places, mines, industrial sites)	

Habitat classes	% cover
Total habitat cover	100%

4.1 Other site characteristics

Soil & geology:

Biogenic reef, Clay, Cobble, Gravel, Limestone/chalk, Mud, Peat, Pebble, Sand, Sandstone/mudstone, Sedimentary, Shingle

Geomorphology & landscape:

Cliffs, Coastal, Estuary, Intertidal rock, Intertidal sediments (including sandflat/mudflat), Islands, Open coast (including bay), Pools, Subtidal rock (including rocky reefs), Subtidal sediments (including sandbank/mudbank), Tidal rapids

4.2 Quality and importance

Sandbanks which are slightly covered by sea water all the time

- for which the area is considered to support a significant presence.

Estuaries

- for which this is considered to be one of the best areas in the United Kingdom.

Mudflats and sandflats not covered by seawater at low tide

- for which this is considered to be one of the best areas in the United Kingdom.

Reefs

- for which the area is considered to support a significant presence.

Atlantic salt meadows (*Glauco-Puccinellietalia maritima*)

- for which this is considered to be one of the best areas in the United Kingdom.

Petromyzon marinus

- for which this is considered to be one of the best areas in the United Kingdom.

Lampetra fluviatilis

- for which this is considered to be one of the best areas in the United Kingdom.

Alosa fallax

- for which this is considered to be one of the best areas in the United Kingdom.

4.3 Vulnerability

The conservation of the site features is dependent on the tidal regime. The tidal range in the Severn Estuary is the second-highest in the world and the scouring of the seabed and strong tidal streams result in natural erosion of the habitats and the presence of high sediment loads. The estuary is therefore vulnerable to large-scale interference, mainly as a result of human actions. These include land-claim, aggregate extraction, physical developments such as barrage construction and other commercial construction activities, flood defences, industrial pollution, oil spillage and tourism-based activities and disturbance.

There are several management mechanisms that seek to secure sustainable management of the Severn Estuary and its wildlife interest. Under the 1994 Habitats Regulations, a management scheme under Regulation 34 was established in 2004 in relation to the international bird interest that underpins designation as a Special Protection Area (SPA). Conservation advice has been provided under Regulation 33 for the Severn Estuary Special Area of Conservation (SAC), SPA and Ramsar site. Under the 2010 Habitat Regulations the management scheme previously produced is being reviewed and expanded to cover the not only the SPA but also the SAC and Ramsar site. The Severn Estuary Partnership is a long-standing partnership whose remit and membership extends beyond the designated area. It predates the European designations and seeks to deliver holistic management of the uses of the estuary. In Wales, Community Strategies and Local Biodiversity Action Plans also contribute to achieving the conservation aims for the Estuary.

5. Site protection status and relation with CORINE biotopes:

5.1 Designation types at national and regional level

Code	% cover
UK01 (NNR)	3.4

UK SAC data form

UK00 (N/A)	77.3
UK04 (SSSI/ASSI)	22.7

NATURA 2000

STANDARD DATA FORM

FOR SPECIAL PROTECTION AREAS (SPA)
FOR SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE (SCI)
AND
FOR SPECIAL AREAS OF CONSERVATION (SAC)

1. Site identification:

1.1 Type 1.2 Site code

1.3 Compilation date 1.4 Update

1.5 Relationship with other Natura 2000 sites

U	K	0	0	1	2	6	4	2
U	K	0	0	1	3	0	0	7
U	K	0	0	1	3	0	3	0
U	K	0	0	3	0	2	0	3

1.6 Respondent(s)

1.7 Site name

1.8 Site indication and designation classification dates

date site proposed as eligible as SCI	
date confirmed as SCI	
date site classified as SPA	199507
date site designated as SAC	

2. Site location:

2.1 Site centre location

longitude	latitude
03 02 57 W	51 13 29 N

2.2 Site area (ha) 2.3 Site length (km)

2.5 Administrative region

NUTS code	Region name	% cover
UK611	Avon	25.04%
UK612	Gloucestershire	21.03%
UK921	Gwent	26.04%
UK632	Somerset	24.04%
UK923	South Glamorgan	4.01%

2.6 Biogeographic region

Alpine

Atlantic

Boreal

Continental

Macaronesia

Mediterranean

3. Ecological information:

3.1 Annex I habitats

Habitat types present on the site and the site assessment for them:

Annex I habitat	% cover	Representativity	Relative surface	Conservation status	Global assessment

3.2 Annex I birds and regularly occurring migratory birds not listed on Annex I

Code	Species name	Population			Site assessment			
		Resident	Migratory		Population	Conservation	Isolation	Global
			Breed	Winter				
A051	<i>Anas strepera</i>		282 I		B		C	
A041a	<i>Anser albifrons albifrons</i>		2664 I		A		B	
A149	<i>Calidris alpina alpina</i>		44624 I		B		C	
A037	<i>Cygnus columbianus bewickii</i>		280 I		B		C	
A048	<i>Tadorna tadorna</i>		3330 I		B		C	
A162	<i>Tringa totanus</i>		2330 I		B		C	

4. Site description:

4.1 General site character

Habitat classes	% cover
Marine areas. Sea inlets	
Tidal rivers. Estuaries. Mud flats. Sand flats. Lagoons (including saltwork basins)	89.0
Salt marshes. Salt pastures. Salt steppes	6.0
Coastal sand dunes. Sand beaches. Machair	4.0
Shingle. Sea cliffs. Islets	
Inland water bodies (standing water, running water)	
Bogs. Marshes. Water fringed vegetation. Fens	
Heath. Scrub. Maquis and garrigue. Phygrana	
Dry grassland. Steppes	
Humid grassland. Mesophile grassland	
Alpine and sub-alpine grassland	
Improved grassland	1.0
Other arable land	
Broad-leaved deciduous woodland	
Coniferous woodland	
Evergreen woodland	
Mixed woodland	
Non-forest areas cultivated with woody plants (including orchards, groves, vineyards, dehesas)	
Inland rocks. Screes. Sands. Permanent snow and ice	
Other land (including towns, villages, roads, waste places, mines, industrial sites)	
Total habitat cover	100%

4.1 Other site characteristics

Soil & geology:

Biogenic reef, Clay, Cobble, Gravel, Limestone/chalk, Mud, Peat, Sand, Sandstone/mudstone, Sedimentary, Shingle

Geomorphology & landscape:

Cliffs, Estuary, Intertidal rock, Intertidal sediments (including sandflat/mudflat), Islands, Open coast (including bay), Pools, Subtidal rock (including rocky reefs), Subtidal sediments (including sandbank/mudbank), Tidal rapids

4.2 Quality and importance

ARTICLE 4.1 QUALIFICATION (79/409/EEC)

Over winter the area regularly supports:

<i>Cygnus columbianus bewickii</i> (Western Siberia/North-eastern & North-western Europe)	3.9% of the GB population 5 year peak mean 1991/92-1995/96
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ARTICLE 4.2 QUALIFICATION (79/409/EEC)

Over winter the area regularly supports:

<i>Anas strepera</i> (North-western Europe)	0.9% of the population 5 year peak mean 1991/92-1995/96
<i>Anser albifrons albifrons</i> (North-western Siberia/North-eastern & North-western Europe)	0.4% of the population 5 year peak mean 1991/92-1995/96
<i>Calidris alpina alpina</i> (Northern Siberia/Europe/Western Africa)	3.3% of the population 5 year peak mean 1991/92-1995/96
<i>Tadorna tadorna</i> (North-western Europe)	1.1% of the population 5 year peak mean 1991/92-1995/96
<i>Tringa totanus</i> (Eastern Atlantic - wintering)	1.3% of the population 5 year peak mean 1991/92-1995/96

ARTICLE 4.2 QUALIFICATION (79/409/EEC): AN INTERNATIONALLY IMPORTANT ASSEMBLAGE OF BIRDS

Over winter the area regularly supports:

84317 waterfowl (5 year peak mean 01/04/1998)

Including:

Cygnus columbianus bewickii , *Anser albifrons albifrons* , *Tadorna tadorna* , *Anas strepera* , *Calidris alpina alpina* , *Tringa totanus* .

4.3 Vulnerability

The conservation of the site features is dependent on the tidal regime. The range is the second highest in the world and the scouring of the seabed and strong tidal streams result in natural erosion of the habitats. The estuary is therefore vulnerable to large scale interference, including human actions. These include land-claim, aggregate extraction/dredging, physical developments such as barrage construction flood defences, pollution (industrial, oil spillage), eutrophication and tourism based activities and disturbance. These issues are being addressed through existing control measures and as part of the Severn Estuary Strategy.

Since June 1995 the Severn Estuary Strategy has been working towards the sustainable management of the site, through the involvement of local authorities, interested parties and local people. This integrated approach is being further developed in conjunction with the SAC management scheme for the nature conservation interest of the estuary.

5. Site protection status and relation with CORINE biotopes:

5.1 Designation types at national and regional level

Code	% cover
UK01 (NNR)	9.0
UK04 (SSSI/ASSI)	100.2

Information Sheet on Ramsar Wetlands (RIS)

Categories approved by Recommendation 4.7 (1990), as amended by Resolution VIII.13 of the 8th Conference of the Contracting Parties (2002) and Resolutions IX.1 Annex B, IX.6, IX.21 and IX. 22 of the 9th Conference of the Contracting Parties (2005).

Notes for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.
2. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 7, 2nd edition, as amended by COP9 Resolution IX.1 Annex B). A 3rd edition of the Handbook, incorporating these amendments, is in preparation and will be available in 2006.
3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

1. Name and address of the compiler of this form:

Joint Nature Conservation Committee

Monkstone House

City Road

Peterborough

Cambridgeshire PE1 1JY

UK

Telephone/Fax: +44 (0)1733 – 562 626 / +44 (0)1733 – 555 948

Email: RIS@JNCC.gov.uk

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DD MM YY

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Designation date

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Site Reference Number

2. Date this sheet was completed/updated:

Designated: 13 July 1995

3. Country:

UK (England/Wales)

4. Name of the Ramsar site:

Severn Estuary

5. Designation of new Ramsar site or update of existing site:

This RIS is for: Updated information on an existing Ramsar site

6. For RIS updates only, changes to the site since its designation or earlier update:

a) Site boundary and area:

** Important note: If the boundary and/or area of the designated site is being restricted/reduced, the Contracting Party should have followed the procedures established by the Conference of the Parties in the Annex to COP9 Resolution IX.6 and provided a report in line with paragraph 28 of that Annex, prior to the submission of an updated RIS.

b) Describe briefly any major changes to the ecological character of the Ramsar site, including in the application of the Criteria, since the previous RIS for the site:

7. Map of site included:

Refer to Annex III of the *Explanatory Notes and Guidelines*, for detailed guidance on provision of suitable maps, including digital maps.

a) A map of the site, with clearly delineated boundaries, is included as:

- i) **hard copy** (required for inclusion of site in the Ramsar List): *yes* ✓ -or- *no* ☐;
- ii) **an electronic format** (e.g. a JPEG or ArcView image) *Yes*
- iii) **a GIS file providing geo-referenced site boundary vectors and attribute tables** *yes* ✓ -or- *no* ☐;

b) Describe briefly the type of boundary delineation applied:

e.g. the boundary is the same as an existing protected area (nature reserve, national park etc.), or follows a catchment boundary, or follows a geopolitical boundary such as a local government jurisdiction, follows physical boundaries such as roads, follows the shoreline of a waterbody, etc.

The site boundary is the same as, or falls within, an existing protected area.

For precise boundary details, please refer to paper map provided at designation

8. Geographical coordinates (latitude/longitude):

51 13 29 N 03 02 57 W

9. General location:

Include in which part of the country and which large administrative region(s), and the location of the nearest large town.

Nearest town/city: Bristol

In the south-west of the United Kingdom, between Wales and England

Administrative region: Bro Morgannwg/ Vale of Glamorgan; Caerdydd/ Cardiff; Casnewydd/ Newport; Avon; City of Bristol; Fynwy/ Monmouthshire; Gloucestershire; Gwent; North Somerset; Somerset; South Glamorgan; South Gloucestershire

10. Elevation (average and/or max. & min.) (metres): **11. Area** (hectares): 24662.98

Min.	-4
Max.	17
Mean	0

12. General overview of the site:

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

The estuary's classic funnel shape, unique in Britain, is a factor causing the Severn to have the second-largest tidal range in the world (after the Bay of Fundy, Canada). This tidal regime results in plant and animal communities typical of the extreme physical conditions of liquid mud and tide swept sand and rock. The species-poor invertebrate community includes high densities of ragworms, lugworms and other invertebrates forming an important food source for passage and wintering waders.

A further consequence of the large tidal range is the extensive intertidal zone, one of the largest in the UK, comprising mudflats, sand banks, shingle, and rocky platforms.

Glassworts and annual sea-blite colonise the open mud, with beds of all three species of eelgrass *Zostera* occurring on more sheltered mud and sandbanks. Large expanses of common cord-grass also occur on the outer marshes. Heavily grazed saltmarsh fringes the estuary with a range of saltmarsh types present. The middle marsh sward is dominated by common saltmarsh-grass with typical associated species. In the upper marsh, red fescue and saltmarsh rush become more prominent.

13. Ramsar Criteria:

Circle or underline each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11).

1, 3, 4, 5, 6, 8

14. Justification for the application of each Criterion listed in 13 above:

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

Ramsar criterion 1

Due to immense tidal range (second-largest in world), this affects both the physical environment and biological communities.

Habitats Directive Annex I features present on the pSAC include:

H1110 Sandbanks which are slightly covered by sea water all the time

H1130 Estuaries

H1140 Mudflats and sandflats not covered by seawater at low tide

H1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritima*)

Ramsar criterion 3

Due to unusual estuarine communities, reduced diversity and high productivity.

Ramsar criterion 4

This site is important for the run of migratory fish between sea and river via estuary. Species include Salmon *Salmo salar*, sea trout *S. trutta*, sea lamprey *Petromyzon marinus*, river lamprey *Lampetra fluviatilis*, allis shad *Alosa alosa*, twaite shad *A. fallax*, and eel *Anguilla anguilla*. It is also of particular importance for migratory birds during spring and autumn.

Ramsar criterion 8

The fish of the whole estuarine and river system is one of the most diverse in Britain, with over 110 species recorded. Salmon *Salmo salar*, sea trout *S. trutta*, sea lamprey *Petromyzon marinus*, river lamprey *Lampetra fluviatilis*, allis shad *Alosa alosa*, twaite shad *A. fallax*, and eel *Anguilla anguilla* use the Severn Estuary as a key migration route to their spawning grounds in the many tributaries that flow into the estuary. The site is important as a feeding and nursery ground for many fish species particularly allis shad *Alosa alosa* and twaite shad *A. fallax* which feed on mysid shrimps in the salt wedge.

Ramsar criterion 5

Assemblages of international importance:

Species with peak counts in winter:

70919 waterfowl (5 year peak mean 1998/99-2002/2003)

Ramsar criterion 6 – species/populations occurring at levels of international importance.

Qualifying Species/populations (as identified at designation):

Species with peak counts in winter:

Tundra swan , <i>Cygnus columbianus bewickii</i> , NW Europe	229 individuals, representing an average of 2.8% of the GB population (5 year peak mean 1998/9-2002/3)
Greater white-fronted goose , <i>Anser albifrons albifrons</i> , NW Europe	2076 individuals, representing an average of 35.8% of the GB population (5 year peak mean for 1996/7-2000/01)
Common shelduck , <i>Tadorna tadorna</i> , NW Europe	3223 individuals, representing an average of 1% of the population (5 year peak mean 1998/9-2002/3)
Gadwall , <i>Anas strepera strepera</i> , NW Europe	241 individuals, representing an average of 1.4% of the GB population (5 year peak mean 1998/9-2002/3)
Dunlin , <i>Calidris alpina alpina</i> , W Siberia/W Europe	25082 individuals, representing an average of 1.8% of the population (5 year peak mean 1998/9-2002/3)
Common redshank , <i>Tringa totanus totanus</i> ,	2616 individuals, representing an average of 1% of the population (5 year peak mean 1998/9-2002/3)

Species/populations identified subsequent to designation for possible future consideration under criterion 6.

Species regularly supported during the breeding season:

Lesser black-backed gull , <i>Larus fuscus graellsii</i> , W Europe/Mediterranean/W Africa	4167 apparently occupied nests, representing an average of 2.8% of the breeding population (Seabird 2000 Census)
---	--

Species with peak counts in spring/autumn:

Ringed plover , <i>Charadrius hiaticula</i> , Europe/Northwest Africa	740 individuals, representing an average of 1% of the population (5 year peak mean 1998/9-2002/3)
--	---

Species with peak counts in winter:

Eurasian teal , <i>Anas crecca</i> , NW Europe	4456 individuals, representing an average of 1.1% of the population (5 year peak mean 1998/9-2002/3)
Northern pintail , <i>Anas acuta</i> , NW Europe	756 individuals, representing an average of 1.2% of the population (5 year peak mean 1998/9-2002/3)

Contemporary data and information on waterbird trends at this site and their regional (sub-national) and national contexts can be found in the Wetland Bird Survey report, which is updated annually. See www.bto.org/survey/webs/webs-alerts-index.htm.

See Sections 21/22 for details of noteworthy species

Details of bird species occurring at levels of National importance are given in Section 22

15. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) biogeographic region:

Atlantic

b) biogeographic regionalisation scheme (include reference citation):

Council Directive 92/43/EEC

16. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Soil & geology	alluvium, basic, biogenic reef, clay, cobble, gravel, limestone/chalk, mud, neutral, nutrient-rich, peat, sand, sandstone/mudstone, sedimentary, shingle
Geomorphology and landscape	cliffs, coastal, estuary, floodplain, intertidal rock, intertidal sediments (including sandflat/mudflat), islands, lowland, open coast (including bay), pools, subtidal rock (including rocky reefs), subtidal sediments (including sandbank/mudbank), tidal rapids
Nutrient status	eutrophic
pH	circumneutral
Salinity	brackish / mixosaline, saline / euhaline
Soil	mainly mineral
Water permanence	usually permanent
Summary of main climatic features	Annual averages (Cardiff, 1971–2000) (www.metoffice.com/climate/uk/averages/19712000/sites/cardiff.html) Max. daily temperature: 14.3° C Min. daily temperature: 6.8° C Days of air frost: 33.0 Rainfall: 1111.7 mm Hrs. of sunshine: 1518.0

General description of the Physical Features:

The Severn Estuary is a large estuary with extensive intertidal mudflats and sandflats, rocky platforms and islands. Saltmarsh fringes the coast backed by grazing marsh with freshwater ditches and occasional brackish ditches. The seabed is rock and gravel with subtidal sandbanks. The estuary's classic funnel shape, unique in the UK, is a factor causing the Severn to have the second-highest tidal range in the world. This tidal regime results in plant and animal communities typical of the extreme physical conditions of liquid mud and tide-swept sand and rock. A further consequence of the large tidal range is an extensive intertidal zone, one of the largest in the UK.

17. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, general land use, and climate (including climate type).

The Severn Estuary is a large estuary with extensive intertidal mudflats and sandflats, rocky platforms and islands. Saltmarsh fringes the coast backed by grazing marsh with freshwater ditches and occasional brackish ditches. The seabed is rock and gravel with subtidal sandbanks. The estuary's classic funnel shape, unique in the UK, is a factor causing the Severn to have the second-highest tidal range in the world. This tidal regime results in plant and animal communities typical of the extreme physical conditions of liquid mud and tide-swept sand and rock. A further consequence of the large tidal range is an extensive intertidal zone, one of the largest in the UK.

18. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

Shoreline stabilisation and dissipation of erosive forces, Sediment trapping

19. Wetland types:

Inland wetland, Marine/coastal wetland

Code	Name	% Area
G	Tidal flats	84.1
H	Salt marshes	4.7
D	Rocky shores	4.7
E	Sand / shingle shores (including dune systems)	4.4
Tp	Freshwater marshes / pools: permanent	1
B	Marine beds (e.g. sea grass beds)	0.9
F	Estuarine waters	0.2

20. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site, and the ecosystem services of the site and the benefits derived from them.

The large tidal range leads to strong tidal streams and high turbidity, producing communities characteristic of the extreme physical conditions of liquid mud and tide-swept sand and rock. Broad intertidal flats with areas of unstable sand and muddy flats support high densities of invertebrates. Intertidal rock platforms support a wide variety of invertebrate species. There are large areas of subtidal sand, rock and gravel with a variety of aquatic estuarine communities including *Sabellaria alveolata* reef. Areas of saltmarsh fringe the estuary, mostly grazed with a range of vegetation communities. There are gradual and stepped transitions between bare mudflat to upper marsh and grassland. Main vegetation types are: upper saltmarsh with *Festuca rubra* and *Juncus gerardii*; middle marsh dominated by *Puccinellia maritima* with *Glaux maritima* and *Triglochin maritima*; dense monocultures of *Spartina anglica* at the edge of the mudflats-brackish pools and depressions with *Phragmites australis* and *Bolboschoenus maritimus*.

Ecosystem services

21. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Nationally important species occurring on the site.**Higher Plants.**

Aster linosyris (nationally rare),
Alopecurus bulbosus, *Althaea officinalis*, *Bupleurum tenuissimum*, *Hordeum marinum*, *Lepidium latifolium*, *Petroselinum segetum*, *Puccinellia rupestris*, *Trifolium squamosum*, *Zostera marina/angustifolia*, *Zostera noltei* (all nationally scarce)

22. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Birds**Species currently occurring at levels of national importance:****Species regularly supported during the breeding season:**

Herring gull, *Larus argentatus argentatus*, NW 1540 apparently occupied nests, representing an average of 1.1% of the GB population (Seabird Europe and Iceland/W Europe) 2000 Census)

Species with peak counts in spring/autumn:

Little egret , <i>Egretta garzetta</i> , West Mediterranean	17 individuals, representing an average of 1% of the GB population (5 year peak mean 1998/9-2002/3)
Ruff , <i>Philomachus pugnax</i> , Europe/W Africa	12 individuals, representing an average of 1.7% of the GB population (5 year peak mean 1998/9-2002/3)
Whimbrel , <i>Numenius phaeopus</i> , Europe/Western Africa	333 individuals, representing an average of 11.1% of the GB population (5 year peak mean 1998/9-2002/3 - spring peak)
Eurasian curlew , <i>Numenius arquata arquata</i> , N. a. <i>arquata</i> Europe (breeding)	2021 individuals, representing an average of 1.3% of the GB population (5 year peak mean 1998/9-2002/3)
Common greenshank , <i>Tringa nebularia</i> , Europe/W Africa	26 individuals, representing an average of 4.3% of the GB population (5 year peak mean 1998/9-2002/3)
Species with peak counts in winter:	
Eurasian wigeon , <i>Anas penelope</i> , NW Europe	4658 individuals, representing an average of 1.1% of the GB population (5 year peak mean 1998/9-2002/3)
Northern shoveler , <i>Anas clypeata</i> , NW & C Europe	297 individuals, representing an average of 2% of the GB population (5 year peak mean 1998/9-2002/3)
Common pochard , <i>Aythya ferina</i> , NE & NW Europe	1118 individuals, representing an average of 1.8% of the GB population (5 year peak mean 1998/9-2002/3)
Water rail , <i>Rallus aquaticus</i> , Europe	11 individuals, representing an average of 2.4% of the GB population (5 year peak mean 1998/9-2002/3)
Spotted redshank , <i>Tringa erythropus</i> , Europe/W Africa	10 individuals, representing an average of 7.3% of the GB population (5 year peak mean 1998/9-2002/3)

Species Information

Species occurring at levels of international importance on the site.

Fish.

Alosa alosa (IUCN Red data book – threatened; Habitats Directive Annex II, Annex V (S1102)),
Alosa fallax (IUCN Red data book – threatened; Habitats Directive Annex II, Annex V (S1103))
Lampetra fluviatilis (IUCN Red data book – threatened; Habitats Directive Annex II (S1099)),
Petromyzon marinus (Habitats Directive Annex II (S1095))

Nationally important species occurring on the site.

Invertebrates.

Tenellia adspersa (nationally rare); *Corophium lacustre* (nationally scarce); *Gammarus insensibilis* (nationally scarce)

23. Social and cultural values:

Describe if the site has any general social and/or cultural values e.g. fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values.

Aesthetic
 Archaeological/historical site
 Environmental education/ interpretation

Fisheries production
 Livestock grazing
 Non-consumptive recreation
 Scientific research
 Sport fishing
 Sport hunting
 Tourism
 Traditional cultural
 Transportation/navigation

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning? No

If Yes, describe this importance under one or more of the following categories:

- i) sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:
- ii) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:
- iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:
- iv) sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

24. Land tenure/ownership:

Ownership category	On-site	Off-site
Non-governmental organisation (NGO)	+	+
Local authority, municipality etc.	+	+
National/Crown Estate	+	
Private	+	+
Public/communal	+	+
Other	+	

25. Current land (including water) use:

Activity	On-site	Off-site
Nature conservation	+	+
Tourism	+	+
Recreation	+	+
Current scientific research	+	+
Fishing: commercial	+	+
Fishing: recreational/sport	+	+
Gathering of shellfish	+	
Bait collection	+	
Arable agriculture (unspecified)		+
Grazing (unspecified)	+	+
Permanent pastoral agriculture		+

Hunting: recreational/sport	+	+
Industrial water supply	+	
Industry	+	+
Sewage treatment/disposal	+	+
Harbour/port	+	+
Flood control	+	+
Mineral exploration (excl. hydrocarbons)	+	+
Mining/quarrying	+	+
Transport route	+	+
Urban development		+
Military activities	+	+

26. Factors (past, present or potential) adversely affecting the site’s ecological character, including changes in land (including water) use and development projects:

Explanation of reporting category:

1. Those factors that are still operating, but it is unclear if they are under control, as there is a lag in showing the management or regulatory regime to be successful.
2. Those factors that are not currently being managed, or where the regulatory regime appears to have been ineffective so far.

NA = Not Applicable because no factors have been reported.

Adverse Factor Category	Reporting Category	Description of the problem (Newly reported Factors only)	On-Site	Off-Site	Major Impact?
Dredging	1		+	+	+
Erosion	1		+		+
Recreational/tourism disturbance (unspecified)	1		+	+	

For category 2 factors only.

What measures have been taken / are planned / regulatory processes invoked, to mitigate the effect of these factors?

Is the site subject to adverse ecological change? NO

27. Conservation measures taken:

List national category and legal status of protected areas, including boundary relationships with the Ramsar site; management practices; whether an officially approved management plan exists and whether it is being implemented.

Conservation measure	On-site	Off-site
Site/ Area of Special Scientific Interest (SSSI/ASSI)	+	+

National Nature Reserve (NNR)	+	
Special Protection Area (SPA)	+	
Land owned by a non-governmental organisation for nature conservation	+	+
Management agreement	+	+
Site management statement/plan implemented	+	
Other	+	
Management plan in preparation	+	+

b) Describe any other current management practices:

The management of Ramsar sites in the UK is determined by either a formal management plan or through other management planning processes, and is overseen by the relevant statutory conservation agency. Details of the precise management practises are given in these documents.

28. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

No information available

29. Current scientific research and facilities:

e.g. details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

Contemporary.

Fauna.

Numbers of migratory and wintering wildfowl and waders are monitored annually as part of the national Wetland Birds Survey (WeBS) organised by the British Trust for Ornithology, Wildfowl & Wetlands Trust, the Royal Society for the Protection of Birds and the Joint Nature Conservation Committee.

Wildfowl shooting monitoring. Returns received annually from Wildfowling Clubs.

Completed.

Flora and Fauna.

CCW/EN Marine Intertidal Phase 1 survey of the biotopes of the Severn Estuary in 2003/4 BTO Research report 335 for CCW/EN (November 2003). Low tide distribution of waterbirds of Severn Estuary SPA. Results of 2002/03 WeBS low tide counts and a historical analysis (Burton *et al.* 2003).

WWT Wetlands Advisory Service. Report for CCW (April 2003). Baseline bird monitoring of the River Severn.

Joint Nature Conservation Committee (1997) Subtidal biotope survey at mouth of the River Parrett.

Joint Nature Conservation Committee (1997) Upper estuary intertidal rocky shore survey.

Mettam, C (1997) *Biotopes in the subtidal sandbanks of the Severn estuary*. Report to English Nature

30. Current communications, education and public awareness (CEPA) activities related to or benefiting the site:

e.g. visitor centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

There are fixed interpretation panels and hides at Bridgwater Bay, Newport Wetlands Reserve, Flat Holm LNR and field centre. Interpretation boards at Black Rock.

31. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

Activities, Facilities provided and Seasonality.

Walking, dog walking, and birdwatching are concentrated along the sea walls all the year round and on the saltmarsh and sandy beaches.

Bathing, beach recreation, including sand yachting and wind surfing are practised on the sandy beaches, mainly in the summer.

There are boat clubs/marinas in the sub-estuaries with sailing, motor boats, and jet skiing. Angling is carried out from the shore and small boats. There is a certain amount of bait digging. Wildfowling is carried out from September to February all around the Estuary; consents and further management measures are being addressed. There are agreed refuge areas for the birds.

32. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept. of Agriculture/Dept. of Environment, etc.
 Head, Natura 2000 and Ramsar Team, Department for Environment, Food and Rural Affairs,
 European Wildlife Division, Zone 1/07, Temple Quay House, 2 The Square, Temple Quay, Bristol,
 BS1 6EB
 Head, Countryside Division, Welsh Assembly Government, Cathays Park, Cardiff, CF1 3NQ

33. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Site Designations Manager, English Nature, Sites and Surveillance Team, Northminster House,
 Northminster Road, Peterborough, PE1 1UA, UK / Site Safeguard Officer, International
 Designations, Countryside Council for Wales, Maes-y-Ffynnon, Penrhosgarnedd, Bangor,
 Gwynedd, LL57 2DW

34. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see 15 above), list full reference citation for the scheme.

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The Severn Estuary / Môr Hafren European Marine Site

comprising :

**The Severn Estuary / Môr Hafren
Special Area of Conservation (SAC)**

**The Severn Estuary
Special Protection Area (SPA)**

**The Severn Estuary / Môr Hafren
Ramsar Site**

**Natural England & the
Countryside Council for Wales' advice
given under Regulation 33(2)(a) of the Conservation
(Natural Habitats, &c.) Regulations 1994, as amended.**

June 2009



A Welsh version of all or part of this document can be made available on request
from the Countryside Council for Wales

4.1.6 SAC interest feature 6 : River lamprey *Lampetra fluviatilis*

The conservation objective for the river lamprey *Lampetra fluviatilis* feature of the Severn Estuary SAC is to maintain the feature in a favourable condition, as defined below:

The feature will be considered to be in favourable condition when, subject to natural processes¹, each of the following conditions are met:

- i. the migratory passage of both adult and juvenile river lamprey through the Severn Estuary between the Bristol Channel and any of their spawning rivers is not obstructed or impeded by physical barriers, changes in flows, or poor water quality;
- ii. the size of the river lamprey population in the Severn Estuary and the rivers which drain into it, is at least maintained and is at a level that is sustainable in the long term;
- iii. the abundance of prey species² forming the river lamprey's food resource within the estuary, is maintained.
- iv. Toxic contaminants in the water column³ and sediment are below levels which would pose a risk to the ecological objectives described above.

The meaning of terms ¹⁻³ above is explained in **section 4.1.6.1**.

Note : The river lamprey population of the Severn depends on habitat in the adjacent River Usk SAC, River Wye SAC and River Severn. The habitats in these rivers, including spawning and nursery areas, are essential for the fulfilment of the species' lifecycle and therefore the Severn Estuary river lamprey feature can only be in favourable condition if the conservation objectives pertaining to the River Usk SAC and River Wye SAC river lamprey feature are also met in full and there is a continued recorded presence of this species in the River Severn.

4.1.6.1 Explanatory information for the river lamprey *Lampetra fluviatilis* conservation objective

¹ Natural processes in respect of the SAC fish features

River lamprey population:

The size of the population is subject to non anthropogenic factors relating to natural fluctuations of external factors such as food / host availability in the Bristol Channel and more widely and breeding success in the River Severn and other rivers draining into the Severn Estuary.

Supporting habitats

The general meaning of 'natural processes' with respect to the supporting habitats of river lamprey within the estuary is explained in **section 4.1.1.1**

² Prey species

Sea trout *Salmo trutta*, shad *Alosa fallax/Alosa alosa*, herring *Clupea harengus*, sprat *Sprattus sprattus*, flounder *Platichthys flesus* and small gadoids such as whiting *Merlangius merlangus* and pout *Trisopterus luscus* are all potential prey species for the river lamprey found within the Severn Estuary (Bird 2008).

³Water column

Water column should be read to include contributory water flows into the estuary including surface flows over mudflats and saltmarsh.

4.1.7 SAC interest feature 7: The conservation objective for sea lamprey *Petromyzon marinus*

The conservation objective for the sea lamprey *Petromyzon marinus* feature of the Severn Estuary SAC is to maintain the feature in a favourable condition, as defined below:

The feature will be considered to be in favourable condition when, subject to natural processes¹, each of the following conditions are met:

- i. the migratory passage of both adult and juvenile sea lamprey through the Severn Estuary between the Bristol Channel and any of their spawning rivers is not obstructed or impeded by physical barriers, changes in flows, or poor water quality;
- ii. the size of the sea lamprey population in the Severn Estuary and the rivers which drain into it, is at least maintained as is at a level that is sustainable in the long term;
- iii. the abundance of prey species² forming the sea lamprey's food resource within the estuary, is maintained.
- vi. Toxic contaminants in the water column³ and sediment are below levels which would pose a risk to the ecological objectives described above.

The meaning of terms ¹⁻³ above is explained in **section 4.1.7.1**.

Note : The sea lamprey population of the Severn depends on habitat in the adjacent River Usk SAC, River Wye SAC and River Severn. The habitats in these rivers, including spawning and nursery areas, are essential for the fulfilment of the species' lifecycle and therefore the Severn Estuary sea lamprey feature can only be in favourable condition if the conservation objectives pertaining to the River Usk SAC and River Wye SAC sea lamprey shad feature are also met in full and there is a continued recorded presence of this species in the River Severn.

4.1.7.1 Explanatory information for the sea lamprey *Petromyzon marinus* conservation objective

¹ Natural processes in respect of the SAC fish features

Sea lamprey population:

The size of the population is subject to non anthropogenic factors relating to natural fluctuations of external factors such as food / host availability in the Bristol Channel and more widely and breeding success in the River Severn and other rivers draining into the Severn Estuary.

Supporting habitats:

The general meaning of 'natural processes' with respect to the supporting habitats of sea lamprey within the estuary is explained in **section 4.1.1.1**.

²Prey species

Eel *Anguilla anguilla*, cod *Gadus morhua*, and haddock *Melanogrammus aeglefinus* are all potential prey species for the sea lamprey found within the Severn Estuary (Bird 2008)

³Water column

Water column should be read to include contributory water flows into the estuary including surface flows over mudflats and saltmarsh.

4.1.8 SAC interest feature 8: The conservation objective for twaite shad *Alosa fallax*

The conservation objective for the twaite Shad *Alosa fallax* feature of the Severn Estuary SAC is to maintain the feature in a favourable condition, as defined below:

The feature will be considered to be in favourable condition when, subject to natural processes¹, each of the following conditions are met:

- i. the migratory passage of both adult and juvenile twaite shad through the Severn Estuary between the Bristol Channel and their spawning rivers is not obstructed or impeded by physical barriers, changes in flows or poor water quality;
- ii. the size of the twaite shad population within the Severn Estuary and the rivers draining into it is at least maintained and is at a level that is sustainable in the long term.
- iii. the abundance of prey species² forming the twaite shad's food resource within the estuary, in particular at the salt wedge³, is maintained.
- iv. Toxic contaminants in the water column⁴ and sediment are below levels which would pose a risk to the ecological objectives described above.

The meaning of terms¹⁻⁴ above is explained in **section 4.1.8.1**.

Note : The twaite shad population of the Severn depends on habitat in the adjacent River Usk SAC, River Wye SAC and River Severn. The habitats in these rivers, including spawning and nursery areas, are essential for the fulfilment of the species' lifecycle and therefore the Severn Estuary twaite shad feature can only be in favourable condition if the conservation objectives pertaining to the River Usk SAC and River Wye SAC twaite shad feature are also met in full and there is a continued recorded presence of this species in the River Severn.

4.1.8.1 Explanatory information for the Twaite shad *Alosa fallax* conservation objective

¹ Natural processes in respect of the SAC fish features

Twaite shad population:

The size of the population is subject to non anthropogenic factors relating to natural fluctuations of external factors such as food availability in the Bristol Channel and more widely and breeding success in the River Severn and other rivers draining into the Severn Estuary.

Supporting habitats:

The general meaning of 'natural processes' with respect to the supporting habitats of twaite shad within the estuary is explained in **section 4.1.1.1**.

² Prey species

Small crustaceans, especially mysids and copepods, small fish, especially sprats and anchovies, and fish eggs (Maitland, P.S. & Hatton-Ellis 2003).

³ Salt wedge

This the area within the estuary where fresh and saline water meet and where the abundance of prey species is particularly important to the twaite shad population. The actual position varies according to the state of the tide and volume of freshwater input to the estuary.

⁴Water column

Water column should be read to include contributory water flows into the estuary including surface flows over mudflats and saltmarsh.

4.2 Conservation objectives for SPA European Marine Site interest features

The protection and management of the SPA in accordance with Article 6 of the Habitats Directive, including in particular the consideration of plans and projects under Article 6(3) and 6(4), should be carried out in view of the conservation objectives in this section.

Note : The conservation objectives for areas of the SPA which lie outside the European Marine Site boundary are provided in separate documents by CCW and Natural England which are currently in preparation and will soon be available on request.

4.2.1 SPA Interest feature 1: Internationally important population of regularly occurring Annex 1 species : Bewick's swan

The conservation objective is to maintain the Bewick's swan population and its supporting habitats¹ in **favourable condition**, as defined below

The interest feature Bewick's swan will be considered to be in favourable condition when, subject to natural processes², each of the following conditions are met:

- (i) the 5 year peak mean population size for the Bewick's swan population is no less than 289 individuals (ie the 5 year peak mean between 1988/9 - 1992/3);
- (ii) the extent of saltmarsh at the Dumbles (Appendix 8: Map 1) is maintained;
- (iii) the extent of intertidal mudflats and sandflats at Frampton Sands, Waveridge Sands and the Noose (Appendix 8: Map 1) is maintained;
- (iv) the extent of vegetation with an effective field size of >6 ha and with unrestricted bird sightlines > 500m at feeding, roosting and refuge sites (Appendix III) are maintained;
- (v) greater than 25% cover of suitable soft leaved herbs and grasses³ in winter season throughout the transitional saltmarsh at the Dumbles (Appendix 8: Map 1) is maintained;
- (vi) aggregations of Bewick's swan at feeding, roosting and refuge sites are not subject to significant disturbance.

4.2.1.1 Explanatory information for the Bewick's swan conservation objective

¹ Key supporting habitats for the Annex I species

- **Intertidal mudflats and sandflats**
- **Saltmarsh**

² Natural processes in respect of the SPA

Each interest feature is subject to both natural processes and human influences. Human influence on the interest features is acceptable provided that it is compatible with the achievement of the conditions set out under the definition of favourable condition for each interest feature. A failure to meet these conditions which is entirely a result of natural processes will not constitute unfavourable condition, but will trigger a review of the definition of favourable condition. This qualification is necessary because:

- (a) the bird populations themselves are subject to natural factors, many of which arise outside the SPA, such as breeding success and winter temperatures;

(b) the supporting habitats of the birds are influenced by the evolution of the estuary. Natural adjustments within estuaries can take many forms. One important example is the tendency of estuaries to accumulate sediment, thereby changing their form from their original Holocene morphology to a state where tidal energy is dissipated by subtidal and intertidal sediment banks or features. This, with other natural processes, will therefore cause the width and depth of the estuary to change over time, moving towards a state of dynamic equilibrium or 'most probable state'. As part of this process, the location and extent of saltmarshes and mudflats may change, provided there is capacity to accommodate readjustment. However, where this process is constrained, the capacity of habitats to accommodate readjustment may be affected.

³Key food plants of Bewick's swan

eg *Agrostis stolonifera*, *Alopecurus geniculatus*, *Glyceria geniculatus*. (This list contains examples and is not exhaustive)

4.2.2 SPA interest feature 2: Internationally important population of regularly occurring migratory species: wintering European white-fronted goose

The conservation objective is to maintain the European white-fronted goose population and its supporting habitats¹ in **favourable condition**, as defined below.

The interest feature European white-fronted goose will be considered to be in favourable condition² when, subject to natural processes², each of the following conditions are met:

- (i) the 5 year peak mean population size for the wintering European white fronted goose population is no less than 3,002 individuals (ie the 5 year peak mean between 1988/9-1992/3);
- (ii) the extent of saltmarsh at the Dumbles (Appendix 8: Map 1) is maintained;
- (iii) the extent of intertidal mudflats and sandflats at Frampton Sands, Waveridge Sands and the Noose (Appendix 8: Map 1) is maintained;
- (iv) greater than 25% cover of suitable soft-leaved herbs and grasses³ is maintained during the winter on saltmarsh areas (Appendix 8: Map 1);
- (v) unrestricted bird sightlines of >200m at feeding and roosting sites are maintained;
- (vi) aggregations of European white-fronted goose at feeding or roosting sites are not subject to significant disturbance.

4.2.2.1 Explanatory information for the wintering European white-fronted goose objective

¹Key supporting habitats for the migratory bird species

- **Intertidal mudflats and sandflats**
- **Saltmarsh**

²Natural processes in respect of the SPA

The meaning of 'natural processes' is explained in **section 4.2.1.1**.

³Key food plants of European white-fronted goose

eg *Alopecurus bulbosus*, *Festuca rubra*, *Hordeum marinum*, *Lolium perenne*; *Puccinellia maritima*.
(This list contains examples and is not exhaustive)

4.2.3 SPA interest feature 3: Internationally important population of regularly occurring migratory species: wintering dunlin

The conservation objective is to maintain the dunlin population and its supporting habitats¹ in **favourable condition**, as defined below:

The interest feature dunlin will be considered to be in favourable condition when, subject to natural processes², each of the following conditions are met:

- (i) the 5 year peak mean population size for the wintering dunlin population is no less than 41,683 individuals (ie the 5 year peak mean between 1988/9 - 1992/3);
- (ii) the extent of saltmarsh (Appendix 8) and associated strandlines is maintained;
- (iii) the extent of intertidal mudflats and sandflats (Appendix 8) is maintained;
- (iv) the extent of hard substrate habitats (Appendix 8) is maintained;
- (v) the extent of vegetation with a sward height of <10cm is maintained throughout the saltmarsh (Appendix 8);
- (vi) the abundance and macro-distribution of suitable invertebrates³ in intertidal mudflats and sandflats (Appendix 8) is maintained;
- (vii) the abundance and macro-distribution of suitable invertebrates³ in hard substrate habitats (Appendix 8) is maintained;
- (viii) unrestricted bird sightlines of >200m at feeding and roosting sites are maintained;
- (ix) aggregations of dunlin at feeding or roosting sites are not subject to significant disturbance.

4.2.3.1 Explanatory information for the wintering dunlin objective

¹Key supporting habitats for the migratory bird species

- **Intertidal mudflats and sandflats**
- **Saltmarsh**
- **Hard substrate habitats (rocky shores)**

²Natural processes in respect of the SPA

The meaning of 'natural processes' is explained in **section 4.2.1.1**.

³Key intertidal invertebrate prey species of dunlin

eg *Carcinus*, *Crangon*, *Hydrobia*, *Macoma*, *Hediste*, and *Talitrus* spp.
(This list contains examples and is not exhaustive)

4.2.4 SPA interest feature 4: Internationally important population of regularly occurring migratory species: wintering redshank

The conservation objective is to maintain the redshank population and its supporting habitats¹ in **favourable condition**, as defined below

The interest feature redshank will be considered to be in favourable condition when, subject to natural processes² each of the following conditions are met:

- (i) the 5 year peak mean population size for the wintering redshank population is no less than 2,013 individuals (ie the 5 year peak mean between 1988/9 - 1992/3);
- (ii) the extent of saltmarsh (Appendix 8) and associated strandlines is maintained;
- (iii) the extent of intertidal mudflats and sandflats (Appendix 8) is maintained;
- (iv) the extent of hard substrate habitats (Appendix IV) is maintained;
- (v) the extent of vegetation with a sward height of <10cm throughout the saltmarsh (Appendix 8) is maintained;
- (vi) the abundance and macro-distribution of suitable invertebrates³ in intertidal mudflats and sandflats (Appendix 8) is maintained;
- (vii) the abundance and macro-distribution of suitable invertebrates³ in hard substrate habitats (Appendix 8) is maintained;
- (viii) unrestricted bird sightlines of >200m at feeding and roosting sites are maintained;
- (ix) aggregations of redshank at feeding or roosting sites are not subject to significant disturbance.

4.2.4.1 Explanatory information for the wintering redshank objective

¹Key supporting habitats for the migratory bird species

- **Intertidal mudflats and sandflats**
- **Saltmarsh**
- **Hard substrate habitats (rocky shores)**

²Natural processes in respect of the SPA

The meaning of 'natural processes' is explained in **section 4.2.1.1**.

³Key intertidal invertebrate prey species of redshank

eg *Carcinus*, *Crangon*, *Hydrobia*, *Macoma*, *Hediste*, and *Talitrus* spp.
(This list contains examples and is not exhaustive)

4.2.5 SPA interest feature 5: Internationally important population of regularly occurring migratory species: wintering shelduck

The conservation objective is to maintain the shelduck population and its supporting habitats¹ in **favourable condition**, as defined below:

The interest feature shelduck will be considered to be in favourable condition when, subject to natural processes², each of the following conditions are met:

- (i) the 5 year peak mean population size for the wintering shelduck population is no less than 2,892 individuals (ie the 5 year peak mean between 1988/9 - 1992/3);
- (ii) the extent of saltmarsh (Appendix 8) is maintained;
- (iii) the extent of intertidal mudflats and sandflats (Appendix 8) is maintained;
- (iv) the extent of hard substrate habitats (Appendix 8) is maintained;
- (v) the abundance and macro-distribution of suitable invertebrates³ in intertidal mudflats and sandflats (Appendix 8) is maintained;
- (vi) unrestricted bird sightlines of >200m at feeding and roosting sites are maintained;
- (vii) aggregations of shelduck at feeding or roosting sites are not subject to significant disturbance.

4.2.5.1 Explanatory information for the wintering shelduck objective

¹Key supporting habitats for the migratory bird species

- **Intertidal mudflats and sandflats**
- **Saltmarsh**
- **Hard substrate habitats (rocky shores)**

²Natural processes in respect of the SPA

The meaning of 'natural processes' is explained in **section 4.2.1.1**.

³Key intertidal invertebrate prey species of shelduck

eg *Carcinus*, *Corophium*, *Hydrobia*, *Macoma*, *Mytilus*, and *Hediste* spp
(This list contains examples and is not exhaustive)

4.2.6 SPA interest feature 6: Internationally important population of regularly occurring migratory species: wintering gadwall

The conservation objective is to maintain the gadwall population and its supporting habitats¹ in **favourable condition**, as defined below:

The interest feature gadwall will be considered to be in favourable condition when, subject to natural processes², each of the following conditions are met:

- (i) the 5 year peak mean population size for the wintering gadwall population is no less than 330 (ie the 5 year peak mean between 1988/9 - 1992/3);
- (ii) the extent of intertidal mudflats and sandflats (Appendix 8) is maintained;
- (iii) unrestricted bird sightlines of >200m at feeding and roosting sites are maintained;
- (iv) aggregations of gadwall at feeding or roosting sites are not subject to significant disturbance.

4.2.6.1 Explanatory information for the wintering gadwall objective

¹Key supporting habitats for the migratory bird species

- **Intertidal mudflats and sandflats**

Note : It is currently unclear what use this species is making of the estuary – they are clearly present in intertidal areas particularly around areas freshwater streams and pills enter the estuary. Although primarily freshwater plant feeders they do also take animal material including insects, molluscs, annelids and even small fish and small amphibians – it is possible that they are feeding on such matter in the freshwater influenced mud and sands. Recent evidence indicates this species is changing its general habits as it extends its range westwards. As a result the conservation objective for this species does not include a condition in respect of the key food sources as for other species at this time.

²Natural processes in respect of the SPA

The meaning of ‘natural processes’ is explained in **section 4.2.1.1**.

4.2.7 SPA interest feature 7: Internationally important assemblage of waterfowl

The conservation objective is to maintain the waterfowl assemblage and its supporting habitats¹ in **favourable condition**, as defined below:

The interest feature waterfowl assemblage will be considered to be in favourable condition when, subject to natural processes², each of the following conditions are met:

- (i) the 5 year peak mean population size for the waterfowl assemblage is no less than 68,026 individuals (ie the 5 year peak mean between 1988/9 - 1992/3);
- (ii) the extent of saltmarsh (Appendix 8) and their associated strandlines is maintained;
- (iii) the extent of intertidal mudflats and sandflats (Appendix 8) is maintained;
- (iv) the extent of hard substrate habitats (Appendix 8) is maintained;
- (v) extent of vegetation of <10cm throughout the saltmarsh (Appendix 8) is maintained;
- (vi) the abundance and macroscale distribution of suitable invertebrates³ in intertidal mudflats and sandflats (Appendix 8) is maintained;
- (vii) the abundance and macroscale distribution of suitable invertebrates³ in hard substrate habitats (Appendix IV) is maintained;
- (viii) greater than 25% cover of suitable soft leaved herbs and grasses⁴ during the winter on saltmarsh areas (Appendix 8) is maintained;
- (ix) unrestricted bird sightlines of >500m at feeding and roosting sites are maintained;
- (x) waterfowl aggregations at feeding or roosting sites are not subject to significant disturbance.

4.2.7.1 Explanatory information for the internationally important assemblage of waterfowl

¹Key supporting habitats for the waterfowl assemblage¹

- **Intertidal mudflats and sandflats**
- **Saltmarsh**
- **Hard substrate habitats (rocky shores)**

²Natural processes in respect of the SPA

The meaning of 'natural processes' is explained in **section 4.1.1**.

³Key intertidal invertebrate prey species of the waterfowl assemblage

eg *Arenicola*, *Carcinus*, *Corophium*, *Crangon*, *Gammarus*, *Hydrobia*, *Macoma*, *Hediste*, *Notomastus* and *Talitrus* spp. - these lists are examples and are not exhaustive

⁴Key saltmarsh food plants

eg *Puccinellia maritima*, *Salicornia* spp., *Agrostis stolonifera*, *Atriplex* spp., *Hordeum marinum*, *Festuca rubra*, *Alopecurus bulbosus*, *Lolium perenne* - these lists are examples and are not exhaustive

4.3.2 Ramsar interest feature 2: Assemblage of migratory fish species¹

The conservation objective for the “assemblage of migratory fish species” feature of the Severn Estuary Ramsar Site is to maintain the feature in favourable condition, as defined below:

The feature will be considered to be in favourable condition when, subject to natural processes², each of the following conditions are met:

- i. the migratory passage of both adults and juveniles of the assemblage of migratory fish species through the Severn Estuary between the Bristol Channel and any of their spawning rivers is not obstructed or impeded by physical barriers, changes in flows, or poor water quality;
- ii. the size of the populations of the assemblage species in the Severn Estuary and the rivers which drain into it, is at least maintained and is at a level that is sustainable in the long term;
- iii. the abundance of prey species³ forming the principle food resources for the assemblage species within the estuary, is maintained.
- iv. Toxic contaminants in the water column⁴ and sediment are below levels which would pose a risk to the ecological objectives described above.

The meaning of terms ¹⁻⁴ above is explained in **section 4.3.2.1**

Note : The populations of three of the assemblage species (river lamprey, sea lamprey and twaite shad) are designated as features of the SAC for which separate specific objectives have been written (refer to sections 4.1.6 to 4.1.8 of this document). The populations of these species depend on habitat in the adjacent River Usk SAC, River Wye SAC and River Severn. The habitats in these rivers, including spawning and nursery areas, are essential for the fulfilment of the species’ lifecycle and therefore these features can only be in favourable condition if the conservation objectives pertaining to the River Usk SAC and River Wye SAC are also met in full and there is a continued recorded presence of these species in the River Severn.

4.3.2.1 Explanatory information for the assemblage of migratory fish species conservation objective

¹ Assemblage of migratory fish species

Species which are designated features of the SAC and for which individual conservation objectives have been written (refer to sections 4.1.6, 4.1.7 and 4.1.8)

Sea lamprey *Petromyzon marinus*
River lamprey *Lampetra fluviatilis*
Twaite shad *Alosa fallax*

Other migratory species in the assemblage

Allis shad *Alosa alosa*
Salmon *Salmo salar*
Sea trout *S. trutta*
Eel *Anguilla anguilla*.

²Natural processes in respect of the Ramsar fish features

Assemblage populations :

The size of the populations is subject to non anthropogenic factors relating to natural fluctuations of external factors such as food / host availability in the Bristol Channel and more widely and breeding success in the River Severn and other rivers draining into the Severn Estuary.

Supporting habitats

The general meaning of ‘natural processes’ with respect to the supporting habitats of the migratory fish assemblage within the estuary is explained in **section 4.1.1.1**.

³Prey species

Assemblage Species	Key prey species
Sea lamprey	Eel <i>Anguilla anguilla</i> , cod <i>Gadus morhua</i> , and haddock <i>Melanogrammus aeglefinus</i> are all potential prey species for the sea lamprey found within the Severn Estuary (Bird 2008)
River lamprey	Sea trout <i>Salmo trutta</i> , shad <i>Alosa fallax/Alosa alosa</i> , herring <i>Clupea harengus</i> , sprat <i>Sprattus sprattus</i> , flounder <i>Platichthys flesus</i> and small gadoids such as whiting <i>Merlangius merlangus</i> and pout <i>Trisopterus luscus</i> are all potential prey species for the river lamprey found within the Severn Estuary (Bird 2008).
Twaite shad	Small crustaceans, especially mysids and copepods, small fish, especially sprats and anchovies, and fish eggs (Maitland, P.S. & Hatton-Ellis 2003).
Allis shad	Small crustaceans, especially mysids and copepods, small fish, especially sprats and anchovies, and fish eggs (Maitland, P.S. & Hatton-Ellis 2003).
Salmon	While at sea, salmon feed on a variety of fish (e.g. herring, sprat, sand eel, mackerel, and various gadoids) and crustaceans (e.g. euphausiid shrimps, prawns, gammarid amphipods and various crabs). (Bird, 2008)
Sea trout	The diet of this species at sea has not been much studied but is believed to include a range of fish species including sprat, young herring and sand eels as well as crustaceans such amphipods (e.g. Corophium), gammarids, decapods such as Crangon and mysid shrimps. Many of these prey items also occur in estuaries where sea trout are known to feed extensively. (Bird, 2008)
Eel	A range of benthic organisms that include crustaceans and small fish. (Bird, 2008)

⁴Water column

Water column should be read to include contributory water flows into the estuary including surface flows over mudflats and saltmarsh.

4.3.3 Ramsar interest feature 3: Internationally important populations of waterfowl : Bewick's swan

The conservation objective for the “Bewick's swan” feature of the Severn Estuary Ramsar Site is to maintain the feature in favourable condition, as defined by the conservation objective for the SPA “Bewick's swan ” feature (refer to section 4.2.1)

4.3.4 Ramsar interest feature 4 : Internationally important populations of waterfowl : European white-fronted goose

The conservation objective for the “European white-fronted goose” feature of the Severn Estuary Ramsar Site is to maintain the feature in favourable condition, as defined by the conservation objective for the SPA “wintering European white-fronted goose” feature (refer to section 4.2.2)

4.3.5 Ramsar interest feature 5: Internationally important populations of waterfowl : dunlin

The conservation objective for the “dunlin” feature of the Severn Estuary Ramsar Site is to maintain the feature in favourable condition, as defined by the conservation objective for the SPA “wintering dunlin ” feature (refer to section 4.2.3)

4.3.6 Ramsar interest feature 6: Internationally important populations of waterfowl : redshank

The conservation objective for the “redshank” feature of the Severn Estuary Ramsar Site is to maintain the feature in favourable condition, as defined by the conservation objective for the SPA “wintering redshank” feature (refer to section sections 4.2.4)

4.3.7 Ramsar interest feature 7: Internationally important populations of waterfowl :shelduck

The conservation objective for the “shelduck” feature of the Severn Estuary Ramsar Site is to maintain the feature in favourable condition, as defined by the conservation objective for the SPA “wintering shelduck” feature (refer to section 4.2.5)

4.3.8 Ramsar interest feature 8: Internationally important populations of waterfowl : gadwall

The conservation objective for the “gadwall” feature of the Severn Estuary Ramsar Site is to maintain the feature in favourable condition, as defined by the conservation objective for the SPA “wintering gadwall” feature (refer to section sections 4.2.6)

4.3.9 Ramsar interest feature 9: Internationally important assemblage of waterfowl

The conservation objective for the “internationally important assemblage of waterfowl” feature of the Severn Estuary Ramsar Site is to maintain the feature in favourable condition, as defined by the conservation objective for the SPA “internationally important assemblage of waterfowl” feature (refer to section sections 4.2.7) – with special reference to the individual species listed and their population figures given in Table 6

Note : This Ramsar Site feature incorporates both wintering and passage populations of some birds and hence some species are included more than once in lists given in Table 6

Appendix 12: Proforma for Stage 3 (Appropriate Assessment Record)

PART A Application Reference and Description: Rivers Parrett and Tone Dredge

Hazard	Interest feature (refer to Appendix 11 for full list within each category)	Favourable condition target for relevant attribute (including range of natural variation) based on conservation objectives	Contribution of attribute to ecological structure and function of site	Contribution of management or other unauthorised sources to attribute and /or feature condition	Adverse Effect of proposal alone on attribute and/or feature	Adverse Effect of proposal in combination with other plans or projects, on attribute and /or feature	Can adverse affects be avoided?	Adverse affect on integrity; long term, short term. Yes, no or uncertain?
Severn Estuary SAC, Ramsar and European Marine Site								
Habitat Loss	Migratory fish	The size of the populations of the assemblage species in the Severn Estuary and the rivers which drain into it, is at least maintained and is at a level that is sustainable in the long term	Population size	None	No: temporary loss and simplification of river habitat in the Tone and the Parrett will not lead to a significant effect on fish populations due to the limited length of river affected and its current sub-optimal condition.	None	N/A	No
Habitat/ community simplification								

APPENDIX 12

Stage 3

FORM HR02 PROFORMA

Turbidity	Migratory fish	Migratory passage of migratory fish species through the Severn Estuary between the Bristol Channel and any of their spawning rivers is not obstructed or impeded by physical barriers, changes in flows, or poor water quality.	Passage of migratory fish between sea and freshwater stages of their lifecycles.	None	Combined effects on water quality and disturbance could prevent some fish reaching suitable habitat for freshwater life stage (e.g. spawning for salmon, adult stage for eels). Scale of effects on water quality and on fish migration is uncertain .	None	Yes: uncertainty will be dealt with by monitoring water quality during the dredge, and taking appropriate action to avoid / minimise effects to fish depending on monitoring results (refer to Annex C of this form).	No, subject to water quality monitoring and appropriate responses during works
Disturbance								
Changes to water chemistry								
Turbidity	Migratory fish	The size of the populations of the assemblage species in the Severn Estuary and the rivers which drain into it, is at least maintained and is at a level that is sustainable in the long term	Population size	None	Combined effects on water quality could lead to direct mortality, and potential effects on migratory passage could affect spawning rates. Scale of effects on water quality and on fish population is uncertain .		As above	No, subject to water quality monitoring and appropriate responses during works
Disturbance								
Changes to water chemistry								

Somerset Levels and Moors SPA and Ramsar site								
Reduced surface water flooding	Wintering (non-breeding) birds	Subject to natural change, to maintain or restore the structure and function of the habitats of the qualifying features.	Feeding and roosting area for wintering water birds	Water Level Management Plan (WLMP) for Curry Moor: maintain required winter water levels for habitats.	Reduced overtopping of River Tone could affect water levels and habitat conditions on Curry Moor, particularly during dry winters: effects on overtopping frequency, volumes, and habitats. Scale of effects is uncertain .	None	Yes: the uncertainty will be dealt with by monitoring habitat conditions, using the findings to inform future reviews of the WLMP (refer to Annex C of this form).	No, subject to habitats monitoring and revising WLMP if needed.
		Subject to natural change, to maintain or restore the supporting processes on which the habitats of the qualifying features rely.	Feeding and roosting area for wintering water birds	WLMP for Curry Moor: controls movement of water between River Tone and Curry Moor.		None		As above
		Subject to natural change, to maintain or restore the populations of the qualifying features.	Population size	WLMP for Curry Moor: aims to maintain splashy conditions preferred by wintering waterbirds.	Potential reduced population size due to reduced habitat quality. Scale of effects is uncertain .	None	Yes: the uncertainty will be dealt with by monitoring population numbers, using the findings to inform future reviews of the WLMP (refer to Annex C of this form).	No, subject to population monitoring and revising WLMP if needed.

Reduced surface water flooding	Invertebrate Assemblage	Subject to natural change, to maintain or restore the structure and function of the habitats of the qualifying features.	Habitat for invertebrates associated with standing water and moorland vegetation	WLMP for Curry Moor: maintain required winter water levels for habitats.	As for wintering bird. Scale of effects is uncertain .	None	As for wintering birds.	No , subject to habitats monitoring and revising WLMP if needed.
		Subject to natural change, to maintain or restore the supporting processes on which the habitats of the qualifying features rely.	Habitat for invertebrates associated with standing water and moorland vegetation	WLMP for Curry Moor: controls movement of water between River Tone and Curry Moor.		None	As for wintering birds.	As above
		Subject to natural change, to maintain or restore the populations of the qualifying features.	Population of invertebrates	WLMP for Curry Moor: maintain desired water levels for species and supporting habitats.	Reduced population size due to reduced habitat quality. Scale of effects is uncertain .	None	Annual habitat condition surveys will be used as a proxy for population; invertebrates will be continue to be monitored according to the once in every 6 year monitoring cycle for the SSSI. Both will inform future reviews of the WLMP.	As above

Severn Estuary SPA and Ramsar site								
Reduced surface water flooding	Wintering (non-breeding) birds	Subject to natural processes, the 5 year peak mean population size for each feature is no less than the 5 year peak mean between 1988/9 - 1992/3	Population size	WLMP for Curry Moor: aims to maintain winter water levels and splashy conditions preferred by wintering waterbirds.	Potential reduced population size due to reduced habitat quality at Curry Moor: the Severn Estuary population uses the Somerset Levels and Moors as an alternative wintering site. Scale of effects is uncertain .	None	Yes: the uncertainty will be dealt with by monitoring habitat conditions at Curry Moor, using the findings to inform future reviews of the WLMP (refer to Annex C of this form).	No, subject to habitats monitoring and revising WLMP if needed.

CONCLUSION

CAN IT BE ASCERTAINED THAT THE PLAN OR PROJECT WILL NOT ADVERSELY EFFECT THE INTEGRITY OF THE EUROPEAN SITE(S)? YES

Somerset Levels and Moors SPA and Ramsar site: wintering waterbirds and red data book invertebrates

Dredging works will reduce the frequency with which the River Tone overtops its banks into Curry Moor. Curry Moor is one component of the Somerset Levels and Moors SPA and Ramsar site, and supports wintering waterbirds and Red Data Book invertebrate interest features. The splashy conditions required to maintain suitable wintering bird conditions can largely be controlled by water level management measures within the moors drainage systems. Water level management measures also help to maintain the network of small rhynes and ditches, and the grassland habitats, which support invertebrate species.

There is uncertainty about the effect of dredging on the frequency with which the River Tone overtops and the volumes of water that will enter Curry Moor during each overtopping event. There is also uncertainty about the effects of such changes on habitat conditions within Curry Moor and therefore on populations of wintering birds and invertebrates that can be supported; conditions are dependent on a range of variables in addition to overtopping from the River Tone. It is also notable that the proposed scheme is a one-off capital scheme that is predicted to reduce flood risk for up to 5 years; therefore, changes in overtopping frequency and volumes may only be temporary.

The uncertainty will be managed by implementing a monitoring programme after dredging has been completed. This will monitor habitat conditions and waterbird populations on Curry Moor. The findings of this monitoring will be used to inform future reviews and the implementation of a revised Water Level Management Plan, if required. The programme is described in Annex C of this form.

With implementation of the proposed monitoring to inform future water level management planning, it can be concluded that there will be no adverse effect on the integrity of the Somerset Levels and Moors SPA and Ramsar sites.

Severn Estuary SPA and Ramsar sites: wintering waterbirds

The Somerset Levels and Moors are ecologically linked to the Severn Estuary SPA and Ramsar sites. This is because the Severn Estuary populations of wintering waterbirds use the Somerset Levels and Moors as an alternative wintering site. The potential effect of the scheme on the Severn Estuary populations is the same as for the Somerset Levels and Moors populations. Monitoring habitat conditions and population numbers on Curry Moor will be used as a proxy for monitoring the effects of the dredge on the Severn Estuary population.

With implementation of the proposed monitoring to inform future water level management planning, it can be concluded that there will be no adverse effect on the integrity of the Severn Estuary SPA and Ramsar sites.

Severn Estuary SAC and Ramsar site: migratory fish

There is potential for dredging operations to cause temporary deterioration in water quality within the River Parrett and River Tone and to generate noise and vibration disturbance. Such changes to river conditions could obstruct the movement and/or cause mortality of migratory fish that form part of the Severn Estuary populations but that use the rivers Parrett and Tone for the freshwater stage of their lifecycles.

There is uncertainty about the magnitude, extent and duration of effects that dredging will have on river water quality; on the effects of reduced water quality on fish; and, on the proportion of the Severn Estuary population that could be exposed to poor water quality. In addition, although the Parrett and Tone are part of the Severn Estuary system, the fish populations supported by these rivers are likely to be small in the context of the main rivers contributing to the Severn Estuary population (Usk, Wye and Severn) and neither the Parrett nor the Tone are designated as a principle salmon river (refer to the Form HR01 form for further details).

The uncertainty will be managed by implementing a monitoring and management programme during the works. The programme sets out key water quality parameters that will be monitored and actions to be taken during construction if thresholds are exceeded. The programme is described in Annex C of this form.

With implementation of the proposed mitigation and the monitoring measures, it can be concluded that there will be no adverse effect on the integrity of the Severn Estuary SAC or Severn Estuary Ramsar sites.

Name of EA officer undertaking appropriate assessment: Kevin House

Signed: *K W M House*

Date: 27th Feb 2014

Endorsed by (if appropriate)

NE comments on appropriate assessment:

Is there agreement with the conclusion? **YES**

Signed: (EN local team manager/ CCW area officer)

Date: xxx

PART B Final Appropriate Assessment Record**PROJECT DETAILS**

Name: Rivers Parrett and Tone Dredge

Grid Reference: River Tone: ST338278 to ST358302
River Parrett: ST358302 to ST331331 (Location provided in Annex A)

Description: An approximately 3.5km section of the River Tone upstream of its confluence with the River Parrett, and an approximately 4.5km section of the River Parrett downstream of where it is joined by the River Tone, will be widened to increase flow capacity and reduce flood risk.

The River Parrett and River Tone have a long history of overtopping their banks in both summer and winter.

The sections of River Parrett and River Tone to be dredged were widened in 1960's to provide increased storage and flow in the main arterial rivers.

Since then, sediment has built up on along banks, narrowing the channels. This has reduced flow capacity by between approximately 20% and 40% when compared to immediately after the 1960's scheme, with the amount of reduction varying between different sections.

The project aim is to reduce the risk of flooding to properties, the road and rail network, and relieve existing flood extents and durations on Curry Moor, Hay Moor, North Moor and Salt Moor (which include both internationally and nationally designated nature conservation sites). The dredging works will reduce the risk of flooding within the area of benefit for up to five years.

No follow-up maintenance is proposed; therefore, the project comprises a one-off dredge limited to a total of 8km of river.

Date: 27 February 2014

APPROPRIATE ASSESSMENT RECORD

This is a record of the appropriate assessment required by Regulation 61 of the Habitats Regulations 2010 (SI 2010/490), undertaken by the Environment Agency in respect of the above project, in accordance with the Habitats Directive (Council Directive 92/43/EEC). Having considered that the project would be likely to have a significant effect on the Somerset Levels and Moors SPA and Ramsar site and the Severn Estuary SAC, SPA and Ramsar site, and that the project was not directly connected with or necessary to the management of the sites for nature conservation, an appropriate assessment has been undertaken of the implications of the proposal in view of the site's conservation objectives.

Natural England (NE) was consulted under Regulation 61(3) on 27 February 2014 and their representations, to which this authority has had regard, are attached at Annex B. The conclusions of this appropriate assessment are in accordance with the advice and recommendations of NE.

The sites' nature conservation objectives have been taken into account, including consideration of the citation for the site and information supplied by NE. The likely effects of the proposal on the international nature conservation interests for which the site was classified or designated may be summarised as:

- Somerset Levels and Moor SPA and Ramsar site: wintering waterbirds and red data book invertebrates:
 - Reduced overtopping of River Tone could affect water levels and habitat conditions on Curry Moor, particularly during dry winters. Scale of effects on habitats and populations of wintering waterbirds and invertebrates is uncertain.
- Severn Estuary SPA and Ramsar site: wintering waterbirds
 - The Severn Estuary populations of wintering waterbirds use the Somerset Levels and Moors as an alternative wintering site. Reduced overtopping of River Tone could affect water levels and habitat conditions on Curry Moor, particularly during dry winters. Scale of effects on habitats and populations is uncertain.
- Severn Estuary SAC and Ramsar site: migratory fish
 - Temporary reduction in water quality during dredging could lead to direct mortality of migratory fish of the Severn Estuary populations that use the River Parrett and River Tone for the freshwater stage of their lifecycles. Scale of effects on water quality and on fish population is uncertain.
 - Temporary reduction in water quality and disturbance could prevent some fish reaching suitable habitat for freshwater life stage (e.g. spawning for salmon, adult stage for eels). Scale of effects on water quality and on fish migration is uncertain.

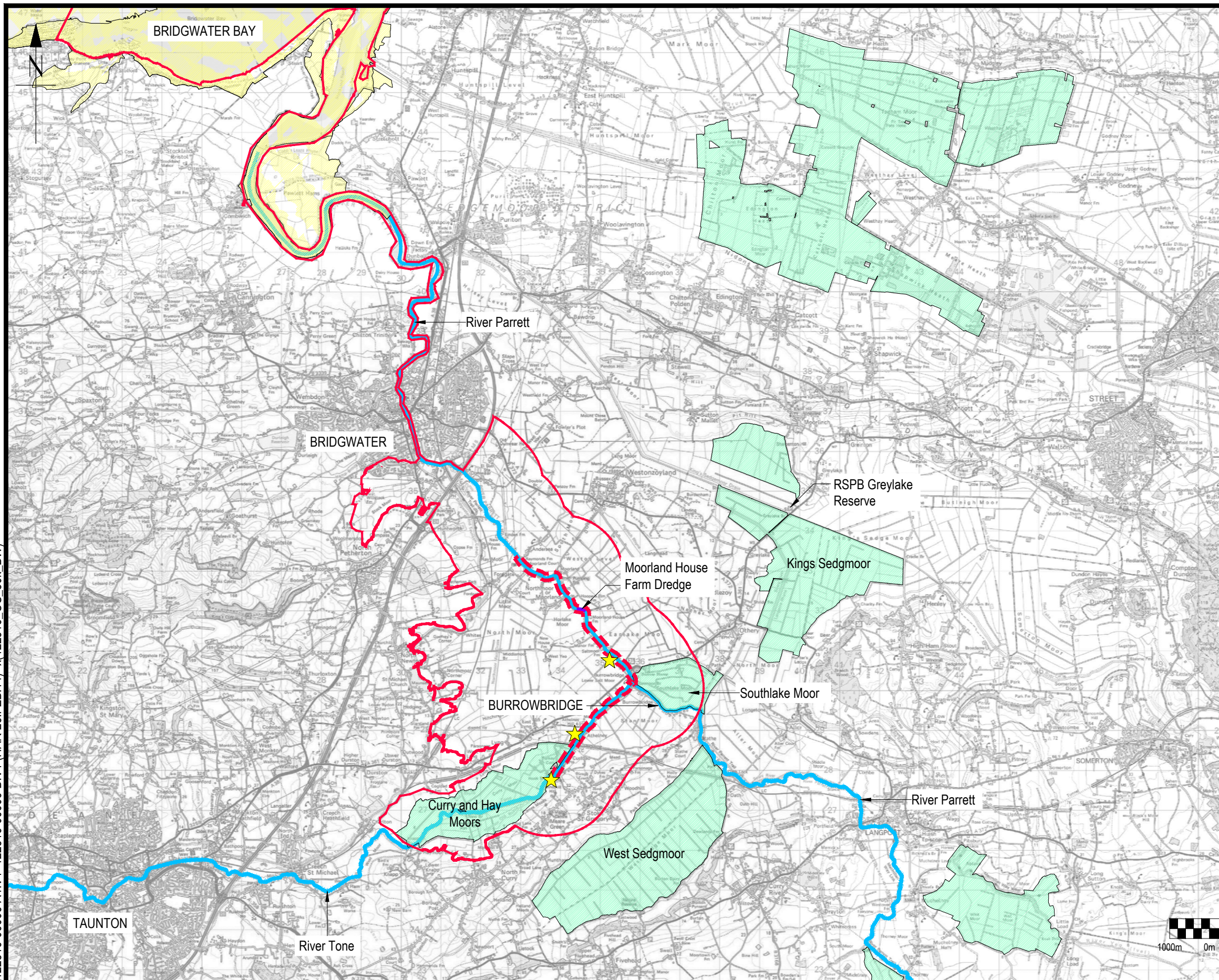
The assessment has concluded that the Rivers Parrett and Tone Dredge as proposed would adversely effect the integrity of the site. The imposition of conditions or restrictions on the way the proposal is to be carried out has been considered and it is ascertained that the following conditions and/or restrictions would avoid adverse effects on the integrity of the site:

- Implementing a monitoring and management programme during dredging to monitor water quality and take appropriate actions to minimise risk to migratory fish when needed (refer to Annex C, Table 1, for details).
- Monitor habitat conditions and water bird populations on Curry Moor after dredging has been completed. The findings will to inform future reviews of the Water Level management planning and implementation (refer to Annex C, Table 2, for details).

Signed (relevant Area Management Team member) and date. xxx

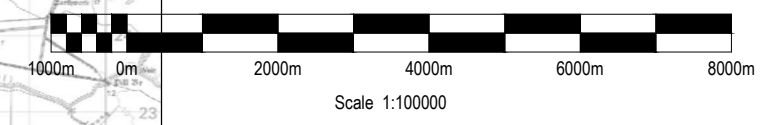
Annex A: Location Plans

122308150.0200150.0201122316-00006-A.1.V1>122316-00006-B.V1 (HAR.26.FEB.14)-x(122316_OS_50k_BW)



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- Legend**
- Rivers Parrett and Tone
 - Proposed dredging extent
 - Moorland House Farm Dredge
 - Extent of environmental study area
 - Proposed welfare facilities in Environment Agency Pumping Stations
 - Somerset Levels and Moors Natura 2000 Site (Special Protection Area, Ramsar)
 - Severn Estuary Natura 2000 Site (Special Area of Conservation, Special Protection Area, Ramsar)



Note : The scale ratios defined in this drawing apply when printed at A3-size only

Rev.	Nature of revision	Drawn	Check	Review	Approved	Date	Approved:	Date	
B	FINAL ISSUE	HAR	ABu	ABu	ESt	26FEB14	Checked:	ABu	21.FEB.14
A	FOR INCLUSION IN REPORT	HAR	ABu	ABu	ESt	21FEB14	Reviewed:	ABu	21.FEB.14
							Approved:	ESt	21.FEB.14

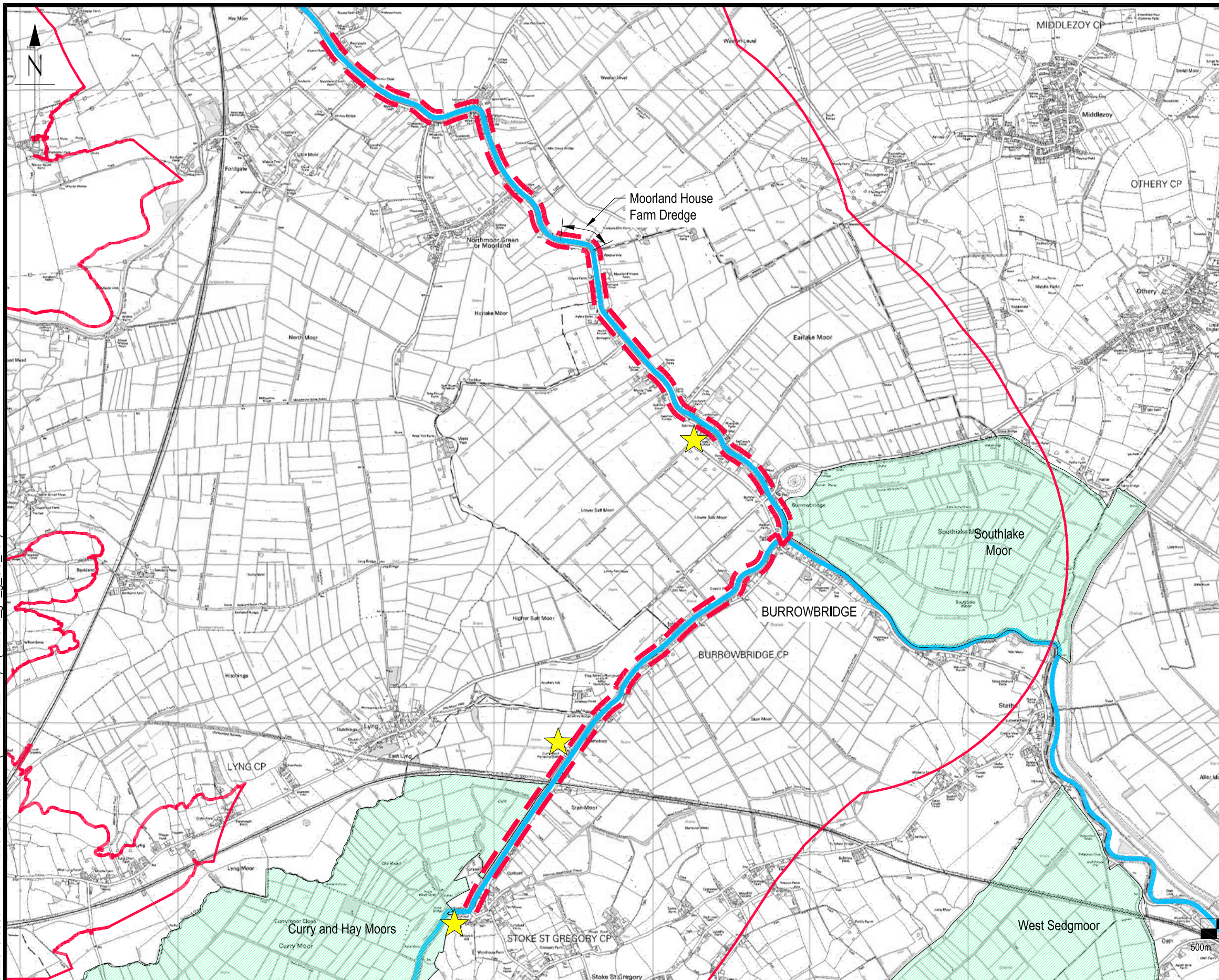
RIVERS PARRETT AND TONE DREDGE

LOCATION OF NATURA 2000 SITES



Drawing no.
122316 - 00006

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- Legend**
- Rivers Parrett and Tone
 - Proposed dredging extent
 - Environmental study area extents
 - Moorland House Farm Dredge
 - Proposed welfare facilities in Environment Agency pumping stations
 - Somerset Levels and Moors Natura 2000 Site (Special Protection Area, Ramsar)

12230850\50.0200\50.0201\122316-00007-A.1.V1>122316-00007-B.V1 (HAR 26.FEB.14) -x(122316_gw_g_OS_10k)



Note : The scale ratios defined in this drawing apply when printed at A3-size only

Rev.	Nature of revision	Drawn	Check	Review	Approved	Date	Approved:	Name	Date
B	FINAL ISSUE	HAR	ABu	ABu	ESt	26FEB14	Checked:	HAR	21.FEB.14
A	FOR INCLUSION IN REPORT	HAR	ABu	ABu	ESt	21FEB14	Reviewed:	ABu	21.FEB.14
							Approved:	ESt	21.FEB.14

PARRETT AND TONE DREDGE
NATURA 2000 SITES IN RELATION TO DREDGING AREA

BLACK & VEATCH
 Building a world of difference.

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Annex B: Natural England Representations

Somerset Levels and Moors Special Protection Area (SPA)
Somerset Levels and Moors Ramsar Site
Curry and Hay Moors Site of Special Scientific Interest (SSSI)
Southlake Moor Site of Special Scientific Interest (SSSI)
North Moor Site of Special Scientific Interest (SSSI)

Option-choice advice to the Environment Agency: *Dredging of the River Tone between NGRs ST3384127818 and ST3583930167 and the River Parrett between NGRs ST3583930167 and ST3318233094*

Following the information received from the Environment Agency regarding this proposal, we write to confirm that it is Natural England's view that **the proposal is likely to lead to an environmentally acceptable solution.**

However, based on the information available to date, we anticipate that the proposal is likely to have a significant effect on the **Somerset Levels and Moors SPA and RAMSAR** and, therefore, **is likely to require an appropriate assessment** under the Conservation of Habitats and Species Regulations 2010. We stress that this advice is provisional, and will need to be reviewed under the Regulations when the design details become available.

Since this proposal is within the vicinity of SSSIs, we stress that this letter does not constitute Natural England's assent or advice for the purposes of section 28H of the Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000). When details of the proposed operation become available and before carrying it out, the Environment Agency, having considered its general duty under section 28G(2) of the Wildlife and Countryside Act 1981, is required to give notice to Natural England. The Environment Agency is required to carry out the operation in accordance with the provisions of section 28H of the Wildlife and Countryside Act 1981 as the proposed operation is within the vicinity of **Curry and Hay Moors, Southlake Moor and North Moor SSSIs.**

This advice is offered based on the information provided to date. It is given without prejudice to any advice that Natural England may offer in accordance with its statutory role under the Conservation of Habitats and Species Regulations 2010 or assent that may be required under the Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000). Formal comment on the proposal will be provided following consultation on the Environmental Statement as required under the relevant Regulations. We look forward to receiving further information as the proposal is developed.

Summary of Natural England's advice at the option choice stage	Answer only yes or no
Is the proposal likely to lead to an environmentally acceptable solution?	
Is the proposal likely to require an appropriate assessment under Habitats Regulations?	

27th February 2014

Our ref: Curry and Hay Moors SSSI

Your ref: 122316/0800/TN1_RevC.0 & 122316/0800/TN5_RevA.0

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Wessex (North) Office
Rivers House
East Quay
Bridgwater
Somerset
TA6 4YS



North Somerset,
Levels & Moors
Team
Riverside Chambers
Castle Street
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TA1 4AP

T 0300 060 0317

Dear Kevin

**SOMERSET LEVELS AND MOORS SPECIAL PROTECTION AREA (SPA)
SOMERSET LEVELS AND MOORS RAMSAR SITE, SEVERN ESTUARY
SPECIAL AREA OF CONSERVATION (SAC), SEVERN ESTUARY SPA
SEVERN ESTUARY RAMSAR SITE
CURRY AND HAY MOORS SITE OF SPECIAL SCIENTIFIC INTEREST (SSSI)**

**THE CONSERVATION OF HABITATS AND SPECIES REGULATIONS 2010
(AS AMENDED)
WILDLIFE AND COUNTRYSIDE ACT 1981 (AS AMENDED) (THE ACT)**

Thank you for your consultation on the River Parrett and Tone Dredging proposal, which was received by Natural England on 27 February 2014.

Natural England is a non-departmental public body. Our statutory purpose is to ensure that the natural environment is conserved, enhanced, and managed for the benefit of present and future generations, thereby contributing to sustainable development.

The application site is within or in close proximity to several European designated sites (also commonly referred to as Natura 2000 sites), and therefore has the potential to affect their interest features. European sites are afforded protection under The Conservation of Habitats and Species Regulations 2010, as amended (the 'Habitats Regulations'). The application site is in close proximity to the following European sites - Somerset Levels and Moors SPA, Severn Estuary SAC and SPA. These sites are also listed as Somerset Levels and Moors, and Severn Estuary Ramsar sites. Part of the dredge is within the Curry and Hay Moors Site of Special Scientific Interest (SSSI), and adjacent to Southlake Moor, and North Moor SSSI's. Please see the subsequent sections of this letter for our advice relating to SSSI features.

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In considering the European site interest, Natural England advises that you, as a competent authority under the provisions of the Habitats Regulations, should have regard for any potential impacts that a plan or project may have. The [Conservation objectives](#) for each European site explain how the site should be restored and/or maintained and may be helpful in assessing what, if any, potential impacts a plan or project may have.

122316 / 0800 / TN1 (Assessment of Likely Significant Effects on a European Site - Form HR01

Natural England notes that your authority, as competent authority under the provisions of the Habitats Regulations, has screened the proposal to check for the likelihood of significant effects.

Your assessment concludes that your authority cannot rule out the likelihood of significant effects arising from the proposal, either alone or in-combination. On the basis of information provided, Natural England concurs with this view.

Natural England therefore advises that an Appropriate Assessment should be undertaken, in order to assess the implications of the proposal for the European site(s), in view of the site conservation objectives. Natural England is a statutory consultee at the Appropriate Assessment stage of the Habitats Regulations Assessment process.

122316 / 0800 / TN5_Rev A.0 Rivers Parrett and Tone Dredging Habitats Regulations Assessment: Appropriate Assessment for Consultation with Natural England

Natural England notes that your authority, as competent authority under the provisions of the Habitats Regulations, has undertaken an Appropriate Assessment of the proposal, in accordance with Regulation 61 of the Regulations. Natural England is a statutory consultee on the Appropriate Assessment stage of the Habitats Regulations Assessment process.

Your appropriate assessment concludes that your authority is able to ascertain that the proposal will not result in adverse effects on the integrity of any of the sites in question. Having considered the assessment, and the measures proposed to mitigate for all identified adverse effects that could potentially occur as a result of the proposals, Natural England advises that we concur with the assessment conclusions, providing that all mitigation measures are appropriately secured.

Assent under Section 28H of the Act

When further details of the proposed operations become available, and on receipt of appropriate notice, Natural England will provide our Assent under Section 28H of the Act.

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Protected Species

Natural England and Environment Agency staff are working together to ensure that all issues relating to protected species are taken into account in the final proposal.

Yours sincerely

A handwritten signature in black ink, appearing to read 'D Gowler', written in a cursive style.

Donna Gowler
Team Leader
North Somerset, Levels and Moors Land Management Team

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Annex C: Monitoring and management Programme

Annex C: Monitoring, mitigation and management measures to address potential effects on Natura 2000 sites and features

Table A. During Dredging

Parameter/ measure	Threshold	Method	Timing / Frequency	Action in event of breach	Responsibility	Purpose
Interest feature: Wintering waterbirds (Somerset levels and Moors SPA & Ramsar; Severn Estuary SPA and Ramsar site)						
No dredging within 250m of Natura 2000 site or SSSI boundary between November and March inclusive.	N/A	Works programming.	November to March inclusive.	N/A	Contractor	Avoid disturbance of wintering birds on Curry Moor and Southlake Moor
Interest feature: Migratory fish (Severn Estuary SAC and Ramsar site)						
Set up a monitoring regime to test for water quality at fixed locations upstream and downstream of the reaches being dredged.	N/A	Establish three fixed monitoring locations, e.g. at bridges to allow for safe access: <ul style="list-style-type: none"> Upstream of works on the Parrett Upstream of works on the Tone Downstream of works on the Parrett Test for: <ul style="list-style-type: none"> Dissolved oxygen Temperature Ammonia. May be possible to use existing monitoring stations.	Weekly during dredging period.	See thresholds and responses for individual parameters (below)	EA Environment Management (EM) and Environmental Monitoring (A&R)	Inform the dynamic assessment of risk to migratory fish species during dredging.

Parameter/ measure	Threshold	Method	Timing / Frequency	Action in event of breach	Responsibility	Purpose
Set up a monitoring regime at fixed locations upstream and downstream of the reaches being dredged.	N/A	Use same fixed monitoring locations as per water quality. Monitor for: <ul style="list-style-type: none"> Fish. Precise method to be determined through liaison with EA F&B.	Weekly during dredging period.	N/A	EA F&B, EM and A&R	Inform the dynamic assessment of risk to migratory fish species during dredging. Wider monitoring for WFD BQEs and protected species at these locations will be undertaken as part of the EAP.
Dissolved oxygen monitoring	Should not fall below 30% Should not rise above 120% Thresholds based on those established for the Wessex Area Somerset Rivers weed cutting protocol.	Monitoring via DO probes and telemetry. Mobile monitoring locations established at the upstream and downstream extents of each reach to be dredged each day. Proposed use of automatic monitoring equipment using a probe on a float system; method to be confirmed with EA environmental monitoring specialist. In addition, dissolved oxygen and water temperature readings should be taken by dredging plant drivers every 2 hours and logged, as per Wessex Area Somerset Rivers weed cutting protocol.	Continuous	Suspend dredging. Investigate causes and review operations (e.g. time of day, location, operational restrictions). Administer H ₂ O ₂ if low oxygen levels and significant fish kill underway or anticipated.	Automatic monitoring: EA EM and A&R, reporting to ECW E.g. automatic monitoring regime alarmed to mobile phones (via telemetry). Use EAs national water quality instrumentation service. 2-hourly monitoring within dredged area: Contractor.	Minimise risk of fish mortality and obstruction to passage

Parameter/ measure	Threshold	Method	Timing / Frequency	Action in event of breach	Responsibility	Purpose
Water temperature monitoring	Two trigger levels: <ul style="list-style-type: none"> • 15°C • 20°C 	Temperature loggers co-located with DO monitoring. Temperature readings should be taken by dredging plant drivers every 2 hours and logged, as per dissolved oxygen.	Continuous	Exceeds 15°C: dredging above the water line only unless monitoring shows it is safe to continue. Exceeds 20°C: suspend all dredging; then review whether dredging can continue under operational restrictions, e.g. time of day, location, dredge with the tide, closed buckets, single bank working.	As for dissolved oxygen.	Minimise risk of fish mortality and obstruction to passage
Ammonia monitoring	As advised by EA environmental monitoring specialist	Ammonia probes co-located with DO monitoring.	As advised by EA environmental monitoring specialist	Suspend dredging and review operations.	EA EM and A&R, reporting to ECW.	Minimise risk of fish mortality and obstruction to passage
Fish in distress and fish mortality	Any moribund or dead fish observed.	Direct observation by operatives, reported to foreman and/or ECW.	Throughout works.	Suspend dredging. Investigate causes and review operations. Administer H ₂ O ₂ if significant fish kill underway or anticipated.	All site staff, reporting observations to ECW. EA to administer H ₂ O ₂ if needed.	Minimise risk of extensive fish mortality

Parameter/ measure	Threshold	Method	Timing / Frequency	Action in event of breach	Responsibility	Purpose
Phase the dredging to maximise practical extent of dry excavation.	If 15°C Temperature monitoring threshold is breached (see parameters above)	Dependent on location and tide conditions. Lower reaches will be dredged on the ebb tide, following the tide down the bank. Dredging on flow tide may be possible on upper reaches and during neap tides; not on high springs.	Throughout works when monitoring thresholds are breached.	This is a potential response to breaching of water quality thresholds.	Contractor with supervision by ECW.	Response to poor water quality / signs of fish in distress. Reduce suspended sediment loadings: minimise risk of fish mortality and obstruction to passage due to poor water quality.
Do not dredge concurrently on both banks at dredge locations.	If monitoring thresholds are breached (see parameters above)	Only dredge one side of the river during a day; do not dredge opposite side until at least the next day.	Throughout works when monitoring thresholds are breached.	This is a potential response to breaching of water quality thresholds.	Contractor	Response to poor water quality / signs of fish in distress. Reduce suspended sediment loadings and provide an area of 'clear' water along one side of the channel.
Use lidded buckets.	If monitoring thresholds are breached (see parameters above)	Use lidded buckets on excavators.	Throughout works when monitoring thresholds are breached.	This is a potential response to breaching of water quality thresholds.	Contractor	Response to poor water quality / signs of fish in distress. Reduce suspended sediment loadings.

Parameter/ measure	Threshold	Method	Timing / Frequency	Action in event of breach	Responsibility	Purpose
Herding, exclusion or removal of fish.	Potential to use as a preventative measure before dredging if monitoring suggests a risk of dredge area encountering high fish densities and/or water quality risk to fish.	Would need to be developed on case-by-case basis, if needed, and is likely to only be practicable under low flow conditions. Seine netting the entire width of the channel with an exclusion nets placed at each end of the dredge area is theoretically possible, and has been employed previously by Land and Water e.g. in the case of the Tame Canal dredge in 2012. Bubble nets could also be considered. No overnight netting to exclude fish.	Would need to be developed on case-by-case basis.	This is a potential response to breaching of water quality thresholds.	ECW to monitor need based on parameters described above. EA F&B to carry out herding / exclusion; potentially this could involve EA EM sampling and collection team.	Potential response to poor water quality / signs of fish in distress / high densities of fish. Minimise risk of extensive fish mortality.
Leave a low-flow channel.	N/A	Carry out dredging to create/maintain a low flow channel, e.g. by not dredging the entire channel width, and/or dredging to different depths.	Throughout works	N/A	Designer to provide cross sections. Contractor to implement, with supervision by ECW.	Mitigate impacts of loss of flow depth for migratory (and protected) species including eels and salmonids. Maintaining a low flow channel is particularly important when river levels are low, as shallow water is vulnerable to increased temperatures and reduced dissolved oxygen concentrations.

Parameter/ measure	Threshold	Method	Timing / Frequency	Action in event of breach	Responsibility	Purpose
Provide irregularities within the channel.	N/A	Review areas where it may be possible to provide irregularisation of the channel (i.e. berms, pools).	Dependent on findings of review.	N/A	EA to review potential locations and advise contactor.	Reduce habitat simplification and effects on fish species.
“Strip and Recover” a proportion of the phragmites/ marginal plants, re-planting a fringe as operations proceed.	25% of existing vegetation to be recovered and replanted.	Remove strips of vegetated silt and segregate from main dredgings. Notch plant up river banks. No trees or shrubs to be replanted.	Throughout works	N/A	Contractor, with supervision by ECW.	Reduce temporary loss of vegetated habitat used by fish.

Table B. After Dredging

Parameter/ measure	Threshold	Method	Timing / Frequency	Action in event of breach	Responsibility	Purpose
Interest feature: Wintering waterbirds (Somerset levels and Moors SPA & Ramsar; Severn Estuary SPA and Ramsar site)						
Moorland habitats: Curry Moor.	Trigger for habitat monitoring agreed through liaison by EA, with NE and Somerset Drainage Consortium.	Survey habitat conditions, including 'splash' conditions, during dry years. Data from 2 dry winter seasons needed.	Fortnightly surveys once monitoring is triggered.	N/A	EA to organise, using NE and/or surveyors with local expertise as appropriate.	Monitor effects of dredging on habitat conditions that support wintering waterbirds. Findings of this monitoring will be used to inform future reviews and the implementation of a revised Water Level Management Plan, if required.
Wintering bird populations: Curry Moor.	Trigger for waterbirds monitoring agreed through liaison by EA, with NE and Somerset Drainage Consortium.	Survey wintering waterfowl species, numbers and distribution, during dry years. Data from 2 dry winter seasons needed.	Fortnightly surveys once monitoring is triggered.	N/A	EA to organise, using NE and/or surveyors with local expertise as appropriate.	Monitor effects of dredging on wintering waterbird populations. Supplements BTO WeBS surveys. Findings of this monitoring will be used to inform future reviews and the implementation of a revised Water Level Management Plan, if required.

Parameter/ measure	Threshold	Method	Timing / Frequency	Action in event of breach	Responsibility	Purpose
Interest feature: Wintering waterbirds (Somerset levels and Moors SPA & Ramsar; Severn Estuary SPA and Ramsar site)						
Moorland habitats: Curry Moor.	Trigger for waterbirds monitoring agreed through liaison by EA, with NE and Somerset Drainage Consortium.	Survey habitat conditions during dry years: water levels in rynes and ditches, grassland condition. Data from 2 dry winter seasons needed.	Fortnightly surveys once monitoring is triggered.	N/A	EA to organise, using NE and/or surveyors with local expertise as appropriate.	Monitor effects of dredging on habitat conditions that support invertebrates. Habitat condition used as a proxy for effects on populations. This monitoring is in addition to invertebrate monitoring carried out to assess SSSI condition: this is currently monitored by NE once in every 6 years. Findings of this monitoring will be used to inform future reviews and the implementation of a revised Water Level Management Plan, if required.

Key:

A&R	EA's Environmental Monitoring team
EA	Environment Agency
EM	EA's Environmental Management team
HRA	Habitats Regulations Assessment