

**Construction, Maintenance and Environment Work Programme  
Progress Update**

Report by Head of Construction, Maintenance and Environment  
and Director of Operations

**Summary:** This report sets out the progress made in the delivery of the 2016/17 Construction, Maintenance and Environment Section work programme.

A Draft five years dredging programme is included at Section 3. Members are invited to comment upon the locations and projected timings of the works as shown in Appendix 2.

Section 4 updates members on the progress of the CANAPE bid to deliver the Hickling vision.

**1 Construction Programme Updates 2016/17**

- 1.1 The progress of the Construction and Maintenance work programme is described in this report. As previously reported verbally to members, a further detailed breakdown shows that up to the end of October 2016, 26,340m<sup>3</sup> of sediment has been removed from the Rivers and Broads, and the details of quantities and costs achieved so far are set out in Appendix 1. This represents 53% of the programmed target of at least 50,000m<sup>3</sup>.
- 1.2 Dredging at Rockland Boat Dyke has commenced, with a small quantity of removed sediment (approximately 2,000m<sup>3</sup>) needing to be deposited at Postwick Tip due to the elevated mercury levels within the sediments. Some of the remaining removed material will be side cast at Rockland Boat Dyke, with the rest being transported to Rockland Short Dyke to be used for flood defences.
- 1.3 The Hickling Enhancement project has continued to make good and steady progress. The two enhancement areas at Churchill and Studio bay have had the Nico-span geotextile inner and outer walls constructed. The linkflotes (two sets) have been disassembled and floated through Potter Bridge and re-assembled at Marsham Boats. The concrete pump and 360 excavators have been mounted and the flotilla has been moved onto Hickling to start filling the Studio Bay enclosure. Water temperatures have been steadily dropping to below 8 degrees and the work has commenced.

**2 Maintenance Programme Update 2016/17**

- 2.1 The Maintenance Team have been fully deployed since the last report, below are a few highlights of the projects and tasks undertaken:

- 2.2 The recently purchased Berkenherger 6510 Weed Cutter (renamed Harris) has been delivered from Stornoway and put through its paces at How Hill on a small aquatic water plant cutting area. The cutting and collection element went very well with some minor adjustments needed to the depth of the propellers and some titivation to the paintwork required. The vessel is now at the Dockyard to have the works carried out and to be stored ready for service in March 2017.
- 2.3 Given the time of year Conservation tasks are a high priority and teams have been at How Hill Reedham Marsh, Mill Marsh and Snipe Marsh carrying out a variety of works as per the site management plans.
- 2.4 Tree works to clear bank side trees on the River Waveney has started using contactors as well as tree safety works at Barton Boardwalk, Geldeston, Horstead Mill and Wayford Bridge.
- 2.5 New Gauge Boards have been installed at Bure Mouth, new signage erected at Pyes Mill and Haddiscoe de-masting mooring.

### **3 Draft 5 Year Dredging Programme**

- 3.1 Dredging with the aim of reducing a backlog of accumulated sediment is a key part of the Sediment Management Strategy developed in 2007. The strategy provided a good basis for a structured approach to managing dredging particularly by providing waterways specifications, methods of assessing compliance with these specifications, and a means of prioritising a programme of dredging work.
- 3.2 Since 2007 the Authority has put the strategy into practice and refined and adapted its operational approach to this in response to land use changes, experience and improved modelling of hydrographic data. However the considerations as outlined in the strategy remain key factors in prioritising sites and developing forward dredging programs. The feasibility of delivering a programme of dredging is however determined by two additional factors; land availability and equipment availability
- 3.3 Much of the land adjacent to the waterways, particularly marsh land and marginal land near flood banks are registered by landowners for subsidies through agri-environmental and basic payment schemes. The deposit of sediment onto such land generally affects such payments for a period of at least two years until the original land use is restored. Therefore, in order to successfully work with landowners in such areas, the Authority needs to ensure the landowner can realise a long term benefit such as flood bank maintenance or soil improvement, and the Authority may also have to compensate actual income losses in the short term.
- 3.4 Over the last few years setback areas created in the lower river reaches by the Broads Flood Alleviation Project (BESL) have mostly been filled, flood banks have been realigned and in the upper reaches many former 'tip sites' are within designated areas and are no longer available for such use. Therefore as the Authority looks to tackle the most critical areas in need of dredging over the next five years there is an increasing requirement to

transport sediment further and use additional specialist equipment to move the sediment away from the water's edge.

- 3.5 Taking into account the considerations described in this report a summary programme for the next five years is outlined in Appendix 2. This appendix shows the draft locations and quantities. Officers have also added a Gant Chart to identify the potential timings of the dredging and the type of equipment needed to complete the tasks.

#### **4 CANAPE bid preparation**

- 4.1 As members will recall, the Authority along with European partners have been successful in having an Expression of Interest approved for the CANAPE project. 'Creating a New Approach to Peatland Ecosystems' if successful and subject to various consenting procedures, will allow the Authority to further its delivery of the Hickling vision, by improving the littoral margins in Hickling broad, reusing dredged material and improving habitats. An additional part of the project is to explore the potential for reuse of fen materials such as via composting or biofuels, which would assist the Authority in its fen management and create carbon benefits.
- 4.2 The next step in the process is to submit a full application, and the deadline for this is 31 January 2017. Officers are attending a partner meeting on 15-16 December to work up the fine details as transnational benefits and collaborative working will need to be evidenced, and a communication plan developed which will ensure dissemination of the results and learning from the project.
- 4.3 Whilst this opportunity would bring significant funding to the Authority (project currently stands at £900,000 of which £450,000 would be funded by Interreg) it should be noted that there are also resource implications for other work. Firstly, the match funding required for this project will require a continuation of the £60,000 budget per year for a further 4 years beyond 2017/18 (shared 50/50 Nav/NPG). Secondly, the major part of the project if agreement can be reached, is to build Area F or similar from the indicative Vision plan signed off by members previously (see Appendix 3). This will require a substantial commitment in the CME work programme both for the construction of the perimeter, and ongoing dredging to fill the island to required standards to achieve the habitat improvements. This is beneficial to the project in funding terms, as the staff time can be used as part of the match required, it will also have consequences for the delivery of dredging work elsewhere in the system as time will have to be programmed in for this work which is not currently accounted for in the forward plan.
- 4.4 The Broads Authority will be asked to approve the bid at its meeting in January 2017, and so member's views are requested as to level of support that the Navigation Committee has for this project.

- 4.5 A decision on the application would be made in Summer 2017, with the first expenditure able to be made in January 2018. As with the PRISMA project, all claims are made in arrears, which creates a slight cash flow issue. It is proposed that the Vessel and equipment reserve be used to fund the work initially, with claim income used to replace the reserve at the end of the project.

Background papers:	Nil
Author:	Rob Rogers/ Tom Hunter/ Trudi Wakelin
Date of report:	25 November 2016
Broads Plan objectives:	NA1.1
Appendices:	APPENDIX 1 – Dredging Programme 2016/17 APPENDIX 2 – Draft 5 Years Dredging Programme 2017 – 2022 APPENDIX 3 – Hickling Vision indicative plan

## Dredging Progress 2016/17 (April to end October 2016)

## APPENDIX 1

Project Title	Project Element	Active BA dredging weeks Completed (to end Oct / Planned)	Volume Removed m <sup>3</sup>		Annual project Cost <sup>a</sup>	Actual project cost (Apr-Oct)
			Planned	Actual	Planned	Actual
<b>Mid Bure</b>	Horning Church to Ranworth Dyke (Apr-mid Jun)	11/10	5,000	5,820	57,480	62,390
<i>Completed setback areas at Horning Hall</i>						
<b>Bure Mouth</b>	Contractor (April)	-	500	500	3,700	3,700
<i>Contractor completed plough/agitation dredging to clear bar</i>						
<b>Lower Waveney</b>	Burgh Castle (Apr-May)	6/8	4,000	4,140	43,430	36,550
<i>Upstream and including Burgh Castle 24 hr moorings. Shoal at Burgh Flats not completed this year</i>						
<b>Lower Yare</b>	Seven Mile House to Berney Arms (June)	5/6	4,000	4,290	33,060	22,190
<i>Shoals planned for dredging were completed</i>						
<b>Haddiscoe Cut</b>	Haddiscoe and Reedham ends (End Jul–mid Nov)	13/16	14,000	5,390	94,790	88,470
<i>Completed the priority dredging at St Olaves &amp; all along the island side of the Cut. Return to complete priority at the Reedham end Jan 17</i>						
<b>Yare - Whitlingham</b>	Bends downstream of Whitlingham Broad (Aug-Oct)	9/12	5,000	6,200	61,100	14,600
<i>Completed the priority bends identified at Whitlingham. All material brought to Postwick Tip</i>						
<b>Hickling</b>	Marked channel north of Catfield channel (Nov-Jan)	-/15	6,000		129,250	23,350
<i>Dredging planned to start 28<sup>th</sup> November. All Nicospan retaining areas are complete as funded by NP grant for habitat restoration</i>						
<b>Rockland Boat Dyke</b>	Rockland and bar at Langley Dyke (Dec-Jan)	-/8	2,900		29,630	840
<i>Dredging started on 31<sup>st</sup> October. Initial 2,000 m<sup>3</sup> is being brought to Postwick Tip</i>						
<b>Limekiln Dyke</b>	Gayes Staithe to Neatishead Staithe (Feb-Mar)	-/8	3,600		18,960	0
<i>CANCELLED FOR 2016/17 – Replacement equipment for Grab 7 and old Linkflotes will not be available before April 2017</i>						
<b>Lower Bure</b>	Bure Loop (Feb-Mar)	-/6	5,000		34,940	430
<i>Start date in 2016/17 depends on final timing and progress of work at Hickling. Main works duration will be in 2017/18</i>						
<b>TOTAL</b>		<b>44/95</b>	<b>46,400</b>	<b>26,340</b>	<b>506,340</b>	<b>252,520</b>

<sup>a</sup> –project costs includes staff time for all elements (pre-works ecological mitigation, site set-up, active dredging & site restoration); BA plant; & budgetary expenditure (equipment hire, survey costs, contractor costs, mitigation works, materials & consumables etc); within the reporting period.

## Navigation Dredging Programme Summary 2017 to 2022

## APPENDIX 2

2017/18						
River	Reach	Volume (m3)	Sediment use	Landowner	Statutory Consents	Non-BA equipment
River Bure	Marina Keys to Bure Mouth	2000	In river	Crown Estate	EA, NE, MMO, GYPA	Plough
Breydon Water	Breydon Bridge	700	In river	Crown Estate	EA, NE, MMO, GYPA	Plough
River Bure	Three Mile House to Marina Keys	10000	Flood bank	Private agricultural	EA	Concrete pump
River Bure	Stokesby bends	5000	Flood bank	Private agricultural	EA	
River Bure	Thurne Mouth & Horning	4000	Setback	Private riparian	EA	
River Waveney	Breydon (68-78) & Burgh Castle	4700	Setback	Private riparian	EA, NE	
Oulton Broad	North Bay	8000	Setback	SWT	EA	
River Chet	Adjacent to Hardley Flood	4000	Bank strengthen	Private riparian	EA, NE	
Lime Kiln Dyke	Gayes Staithe to Neatishead	3600	Natural bank	Private riparian	EA	
Hickling Broad	Nav channel & Staithe channel	8000	Land spread	Private agricultural	EA, NE, Planning	Suction dredger, bulldozer

2018/19						
River	Reach	Volume (m3)	Sediment Use	Landowner	Statutory Consents	Non-BA equipment
River Bure	Marina Keys to Bure Mouth	10000	In river	Crown Estate	EA, NE, MMO, GYPA	Plough / Water injection dredger
River Bure	Horning	2000	Set back	Private riparian	EA	
River Bure	Three Mile House to Marina Keys	8000	Land spread	Private agricultural	EA, Planning	Concrete pump
River Bure	Belaugh to Coltishall	6000	Natural bank	Private riparian	EA	
River Waveney	Bends near Short Dam Level	6000	Flood bank	SWT	EA	
River Waveney	Bends near Stanley Carrs	5000	Flood bank	Private riparian	EA	
River Chet	Pyes Mill to Loddon	4000	Bank strengthen	Private riparian	EA, NE	Lighters
Waxham Cut		9000	Natural bank + flood bank	Private riparian, private agricultural	EA, NE	8t long reach & Nato floats

2019/20						
River	Reach	Volume (m3)	Sediment Use	Landowner	Statutory Consents	Non-BA equipment
River Bure	S Walsham Fleet Dyke & Broad	5000	Flood bank	NWT	EA	
River Bure	Acle to Stokesby	9000	Flood bank	Private agricultural	EA	
River Ant	Ludham Bridge to Buttle Marsh	5000	Setback	BA / EA	EA	
Tylers Cut		3000	Natural bank	Private riparian	EA	
Haddiscoe Cut	Entrances	5000	Setback	BA / EA	EA	Concrete pump
Oulton Broad		9000	Flood bank	SWT	EA	
River Chet		6000	Bank strengthen	Private riparian	NE, NCC	
Hickling Broad	Catfield Dyke / Hickling	8000	Land spreading	Private agricultural	EA, NE, Planning	Suction dredger, bulldozer

2020/21						
River	Reach	Volume (m3)	Sediment Use	Landowner	Statutory Consents	Non-BA equipment
Breydon Water	Breydon Shoals	2000	In river	Crown Estate	EA, NE, MMO, GYPA	Plough
River Bure	Bure Mouth	500	In river	Crown Estate	EA, NE, MMO, GYPA	Plough
River Bure	Horning & Salhouse Broad	5500	Bank strengthen	Private riparian	EA, Planning	Concrete pump
River Bure	Herringby	6000	Flood bank	Private agricultural	EA	
River Wensum	Trowse Bridge to Bishops Bridge	3000	Landfill	BA	EA	
River Wensum	Bishops Bridge to New Mills	4000	Landfill	BA	EA	
River Waveney	Beccles bypass to Boat House Hill	8000	Flood bank	Private agricultural	EA	
River Waveney	Burgh Castle bends	6000	Setback	Private riparian	EA	Concrete pump
River Yare	Langley Dyke	2000	Flood bank	Private agricultural	EA	
River Waveney	Beccles bypass to Boat House Hill	4000	Flood bank	Private agricultural	EA	
Stalham Dyke	Localised areas & Staithe	9000	Land spreading	Private agricultural	EA, Planning	Suction dredger, bulldozer

2021/22						
River	Reach	Volume (m3)	Sediment Use	Landowner	Statutory Consents	Non-BA equipment
River Bure	Mautby to Bure Loop	8000	Flood bank	Private agricultural	EA	Concrete pump
Barton Broad	North end around the Heater	5000	Bank enhancement	NWT	EA, NE, Planning	
River Ant	Hunset Mill Bends	3000	Natural bank	Private riparian	EA	
River Yare	Cantley bends	4000	Setback	Private agricultural	EA	
River Yare	Surlingham Bends	9000	Natural bank/landfill	Private agricultural	EA	
River Waveney	Burgh St Peter bends	3000	Flood bank	SWT	EA	
River Waveney	Beccles to Geldeston	3000	Natural bank	Private agricultural	EA	
Sutton Dyke		15000	Land spreading	Private agricultural	EA, Planning	Suction dredger, dozer

Notation	
BA	Broads Authority
EA	Environment Agency
NE	Natural England
Planning	Local Planning Authority
MMO	Marine Management Organisation
GYPA	Great Yarmouth Port Authority
NCC	Norfolk County Council (Highways)
NWT	Norfolk Wildlife Trust
SWT	Suffolk Wildlife Trust



# Navigation Dredging Programme Timings 2017 to 2022

## APPENDIX 2

2017/18															
River	Reach	Volume	Tree work	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
River Bure	Marina Keys to Bure Mouth	2000													
Breydon Water	Breydon Bridge	700													
River Bure	Three Mile House to Marina Keys	10000		2 x Exc, 2 x floats, conc pump, sm wherries											
River Bure	Stokesby bends	5000							2x Exc, 1x floats, sm wherries						
River Bure	Thurne Mouth & Horning	4000											2x exc, 1 x floats, sm wherries		
River Bure	Acle Bridge Setbacks restoration														
River Yare	Rockland Dike Restoration														
River Yare	Rockland Short Dyke Restoration														
River Yare	Polkeys Mill Setback Restoration														
River Waveney	Breydon (posts 68-78) & Burgh Castle	4700				2 x Exc, 1 x floats, lg wherries									
Oulton Broad	North Bay	8000		2 x Exc, 1 x floats, lg wherries					2 x Exc, 1 x floats, lg wherries						
River Chet	Adj to Hardley Flood	4000											1 x Exc, 1 x floats		
River Chet	Post removal										1 x exc, 1 x floats, hammer + wherry				
Lime Kiln Dyke	Gayes Staithe to Neatishead	3600									1x excavator, 1 x floats				
Barton Broad	Posts														
Hickling Broad	Nav channel & Staithe channel	8000						Lagoon prep			Contractor suction dredger to lagoon				

2018/19															
River	Reach	Volume	Tree work	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
River Bure	Marina Keys to Bure Mouth	10000									Contractor				
River Bure	Horning	2000		2x exc, 1 x floats, sm wherries											
River Bure	Lagoon preparation														
River Bure	Three Mile House to Marina Keys	8000				2 x Exc, 2 x floats, conc pump, sm wherries									
River Bure	Belaugh to Coltishall	6000									2 x Exc, 1 x floats, small wherries				
River Bure	Horning Hall setbacks restoration														
River Bure	Stokesby rond restoration														
River Bure	Flood bank folding restoration														
Postwick Tip	Wet cell emptying														
River Waveney	Bends near Short Dam Level	6000		2x Exc, 1x floats, lg wherries											
River Waveney	Bends near Stanley Carrs	5000						2x Exc, 1x floats, lg wherries							
River Chet	Pyes Mill to Loddon	4000									2 x Exc, 1 x floats + lighters				
Waxham Cut		9000									1 x Exc, 1 x floats (small set up)				

2019/20															
River	Reach	Volume	Tree work	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
River Bure	S Walsham Fleet Dyke & Broad	5000		2x exc, 1 x floats, lg wherries											
River Bure	Acle to Stokesby	9000					2 x Exc, 1 x floats, sm wherries								
River Ant	Ludham Bridge to Buttle Marsh	5000									2 x Exc, 1 x floats, small wherries				
Tylers Cut		3000									1 x Exc, 1 x floats				
Oulton Broad	Oulton Dyke Setback restoration														
River Bure	Landsread														
Haddiscoe Cut	Entrances	5000		2xExc, 2x floats, small wherries, concrete pump											
Oulton Broad		9000					2 x Exc, 2 x floats, lg wherries								
River Chet		6000										2 x Exc, 1 x floats + lighters			
Hickling Broad	Landsread and preparation														
Hickling Broad	Catfield Dyke / Hickling	8000										Contractor suction dredger			

2020/21															
River	Reach	Volume	Tree work	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Breydon Water	Breydon Shoals	2000													
River Bure	Bure Mouth	500													
River Bure	Horning & Salhouse Broad	5500		2xExc, 2x floats, sm wherries, concrete pump											
River Bure	Herringby	6000					2 x Exc, 1 x floats, sm wherries								
River Wensum	Trowse Bridge to Bishops Bridge	3000									2 x Exc, 1 x floats, sm wherries				
River Wensum	Bishops Bridge to New Mills	4000											2x Exc, 1x floats, sm wherries		
River Waveney	Short Dam & Stanley Carrs restoration														
River Bure	Stokesby rond restoration														
Oulton Broad	Peto's Marsh bank restoration														
River Waveney	Beccles bypass to Boat House Hill	8000		2 x Exc, 2 x floats, lg wherries											
River Waveney	Burgh Castle bends	6000						2 x Exc, 2 x floats, lg wherries, conc pump							
River Yare	Langley Dyke	2000									1 x Exc, 1 x floats				
River Waveney	Beccles bypass to Boat House Hill	4000											2 x Exc, 1 x floats, lg wherries		
Stalham Dyke	Lagoon preparation														
Stalham Dyke	Localised areas & Staithe	9000										Suction dredger			

2021/22															
River	Reach	Volume	Tree work	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
River Bure	Mautby to Bure Loop	8000		2 x Exc, 2 x floats, sm wherries, conc pump											
Barton Broad	Construct retaining structure														
Barton Broad	North end around the Heater	5000									2 x Exc, 1 x floats, lg wherries				
River Ant	Hunset Mill Bends	3000												1 x Exc, 1 x floats	
Hickling Broad	Landsread and field restoration														
River Waveney	Beccles Marhes folding restoration														
River Bure	Herringby rond restoration														
River Chet	Bank restoration														
River Yare	Cantley bends	4000		2 x Exc, 2 x floats, lg wherries											
River Yare	Surlingham Bends	9000					2 x Exc, 1 x floats, lg wherries								
River Waveney	Burgh St Peter bends	3000									2x Exc, 1x floats, sm wherries				
River Waveney	Beccles to Geldeston	3000											2 x Exc, 1 x floats, sm wherries		
Sutton Dyke	Lagoon preparation														
Sutton Dyke		15000									Suction dredger				

Hickling Vision indicative plan

