

Navigation Committee

05 September 2024

Agenda item number 9

Waterways compliance report

Report by Head of Construction, Maintenance & Ecology and Waterways and Recreation Officer

Purpose

This report provides members with information on sediment management and Waterways Specification compliance, as defined in the Waterways Management Strategy. The updated figures are based on new hydrographic surveys carried out in 2024, as part of the planned five-year rolling programme which covers all areas of the public navigation in the Broads.

Broads Plan context

This report relates to the Broads Authority's aim to manage sediment in the Navigation Area, as described in the Broads Plan objective:-

C1 - Maintain navigation water depths to defined specifications, reduce sediment input and dispose of dredged material in sustainable and beneficial ways

Contents

1.	Introduction	1
2.	Waterway specification compliance summary	2
3.	Financial implications	3
4.	Risk implications	4
	Appendix 1 – Prioritisation of locations for future dredging to achieve Waterways Specifications	5

1. Introduction

- 1.1. The Authority adopted the Waterways Management Strategy (WMS) in 2021. A critical outcome of the WMS is to direct the Authority's dredging operations to achieve the Waterway Specification for individual management units within the navigation area. This means that the Authority is focusing its dredging efforts so that waterways users in

the Broads have enough water depth most of the time, except during very rare low tides. Where compliance falls short of the targets, then action can be identified and planned into the future dredging programme.

- 1.2. Compliance assessments are based on an analysis of hydrographic survey data, allowing actual bed profiles to be compared with the desired specification profiles defined in the strategy. Advances in sonar hydroacoustic technology now allow very high-resolution data of the entire bed area of the management units to be compared with the desired profile. This allows for a far more accurate assessment and mapping of non-compliant areas and quantifying the amount of sediment to be removed to achieve compliance.
- 1.3. The spatial and numerical data analysis allows the identification of non-compliant areas and where these can be economically dredged. High-resolution mapping also identifies sediment accumulation more accurately, thus driving efficiency when it comes to targeting sediment removal. The Authority now has hydrographic data covering the entire navigable system in a high-resolution format. The plan is to resurvey the navigation area on a rolling five-year programme to ensure accurate and relatively up-to-date data is available to inform future dredging operations.
- 1.4. As part of the five-year rolling programme, the locations surveyed in January 2024 include all the Management Units in the Upper Thurne (*except the large area of Hickling Broad outside the marked channel*).
- 1.5. In this same surveying window, Oulton Broad, Wayford Bridge to Barton Broad, Sutton Dyke, Stalham Dyke and Haddiscoe Cut were surveyed after dredging to allow assessment of the results.

2. Waterway specification compliance summary

- 2.1. The updated sediment compliance and prioritisation table is included in Appendix 1. The Management Units are ranked based on the final column “Priority Score”.
- 2.2. The description of the columns in Appendix 1 is described in Table 1.

Management Unit	Sediment Volume (m ³)	Non-compliant area (%)	Proportion of economically dredgable sediment (%)	Activity Index	Priority Score
Definable waterbody area (river stretch or broad) where hydrographic data has been captured	Volume of sediment in cubic metres needed to be dredged to achieve the Waterways Specification	Percentage of the surface area of the Management Unit that has some accumulated sediment	Percentage of the Sediment Volume which is in a layer greater than 30 cm (i.e. deep mud)	The average Activity index as generated by mobile phone activity on the water within the	Score calculated by multiplying the values in the previous three columns and

Management Unit	Sediment Volume (m ³)	Non-compliant area (%)	Proportion of economically dredgable sediment (%)	Activity Index	Priority Score
		above the Waterways Specification		Management Unit	dividing by 100

Table 1. Description of the columns in Appendix 1

- 2.3. The Activity Index is derived from analysis of spatial data held by a subscription service that maps movement of mobile phones. The data is summarised for areas within the Management Unit where nothing other than waterways recreation can be occurring and is presented as an index on a scale of roughly zero to five. This method replaces the previous waterways boating survey that used to be carried by staff and volunteers every five years at fixed points over a weekend in the summer. The benefits of the mobile phone spatial data approach are that it's cheaper, can be repeated for any time span (2021 onwards) and operates down to a far greater resolution (100 m grid) over the whole Broads areas.
- 2.4. Table 2 shows the total volume of sediment identified to fully achieve the Waterways Specification within each river.

Table 2. Total sediment volume identified for dredging

River	Sediment Volume 2024 (m ³)
Ant	63,582
Bure	150,475
Chet	2,253
Thurne	307,975
Waveney	92,168
Yare/ Wensum	238,311
Total Volume	854,764

3. Financial implications

- 3.1. By ranking each of the Management Units by dredging priority (as per Appendix 1), the Authority can update and modify the 5-year dredging plan to ensure the targeted deployment of limited resources. The dredging programme is then shaped according to users' needs, particularly Management Units, the availability and cost of sediment re-use options, and efficient mobilisation and deployment of staff and equipment.

- 3.2. Updates on the plan and progress of the dredging programme are given at each Navigation Committee meeting in the regular Construction, Maintenance and Ecology section report.

4. Risk implications

- 4.1. As part of the Authority's compliance with the Port Marine Safety Code through the Safety Management System, the specified waterway depths are managed through the Authority's dredging programme to reduce risks to river users. Where measured water depths do not meet the Waterways Specifications, the prioritisation process outlined in this report allows for the generation of a dredging programme to target projects to bring about the greatest benefits to waterways users. This cyclical process of surveying, project planning, dredging, re-surveying and reporting enables the Authority to do this effectively and transparently.

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[Broads Plan](#) strategic objectives: **C1** - Maintain navigation water depths to defined specifications, reduce sediment input and dispose of dredged material in sustainable and beneficial ways

Appendix 1 – Prioritisation of locations for future dredging to achieve Waterways Specifications

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River	Management Unit	Sediment Volume (m ³)	Non-compliant area (%)	Proportion of economically dredgable sediment (%)	Activity Index	Priority Score
Bure	Salhouse Broad	17,237	90.0	82	2.76	202.7
Thurne	Catfield Dyke	3,643	82.2	89	2.76	202.7
Waveney	Geldeston Dyke	2,278	89.2	94	2.36	198.4
Yare	Rockland Broad (outside marked channel)	116,022	98.6	100	1.86	182.6
Yare	Bargate Broad	14,452	94.0	100	1.67	156.0
Waveney	Haddiscoe Cut	29,914	63.8	88	2.32	130.3
Bure	Horstead to Coltishall Common	5,844	60.7	89	2.41	129.8
Thurne	Somerton Boat Dyke	638	77.1	56	2.85	122.9
Yare	Thorpe River Green	4,820	58.5	73	2.77	118.5
Bure	Hoveton Viaduct Bridge to Salhouse	18,483	41.6	71	3.97	116.7
Bure	Cockshoot Dyke	418	84.4	90	1.43	108.9
Yare	Bishops Bridge to Postwick	20,975	25.1	85	5.03	107.8
Ant	Barton Broad to Ludham Bridge	19,548	68.0	53	2.91	104.7

River	Management Unit	Sediment Volume (m ³)	Non-compliant area (%)	Proportion of economically dredgable sediment (%)	Activity Index	Priority Score
Yare	Rockland Broad (channels & dykes)	14,562	61.9	89	1.90	104.0
Ant	Sutton Dyke	8,577	64.9	56	2.74	100.3
Bure	South Walsham Broad	9,450	70.3	62	2.27	98.9
Yare	Langley Dyke	1,174	39.5	80	2.92	91.8
Thurne	Martham Dyke	663	100.0	100	0.91	91.3
Thurne	Horsey Mere	49,950	97.4	33	2.61	83.2
Yare	New Mills to Bishops Bridge	3,665	23.0	86	4.06	80.3
Bure	Marina Quays to Bure Mouth	9,127	29.8	87	3.03	78.5
Bure	Salhouse Broad to Horning Church	14,965	21.8	70	4.93	75.7
Bure	Acle Dyke	3,679	86.3	97	0.82	68.7
Thurne	Martham Ferry to West Somerton Drainage Mill	5,592	49.0	64	2.07	64.9
Ant	Womack Dyke	3,304	48.9	53	2.47	63.5
Ant	Ludham Bridge to Ant Mouth	2,296	45.7	46	3.00	62.7
Waveney	Oulton Broad	28,214	59.5	44	2.36	62.0
Ant	Upton Dyke	763	43.8	70	1.97	60.6
Ant	Smallburgh Canal	992	26.4	98	2.21	57.1
Thurne	Hickling outside channel	193,018	81.7	60	1.12	54.5
Ant	Tyler's Cut	1,415	64.9	50	1.65	53.8

River	Management Unit	Sediment Volume (m ³)	Non-compliant area (%)	Proportion of economically dredgable sediment (%)	Activity Index	Priority Score
Bure	Malthouse Broad	6,215	52.1	49	2.10	53.1
Yare	Bargate (channel and dykes)	2,015	42.3	86	1.39	50.9
Yare	Deal Ground to Trowse Eye	1,975	28.1	83	2.12	49.4
Waveney	Stalham Dyke	5,773	47.6	68	1.53	49.0
Thurne	Hickling Broad (inside channel)	16,463	68.1	49	1.46	49.0
Thurne	Turkey Broad	7,744	43.8	65	1.70	48.2
Bure	Mautby Marsh Mill to Marina Quays	23,666	25.0	91	1.97	44.9
Yare	Hardley Dyke	2,709	64.0	98	0.69	43.4
Thurne	Deep/Deep Go Dyke	1,316	14.5	83	3.47	42.0
Ant	Lime Kiln Dyke	1,209	49.2	58	1.42	40.7
Bure	Coltishall Common to Jubys Farm	11,409	57.6	64	1.02	37.3
Bure	Juby's Farm to Caen Meadow	3,089	25.9	56	2.52	36.8
Thurne	Wayford Bridge to Barton Broad	8,794	44.0	53	1.35	31.5
Bure	Caen Meadow to Hoveton Viaduct Bridge	3,129	25.7	52	1.91	25.7
Bure	Acle Bridge to Stokesby	6,228	13.0	84	2.34	25.5
Yare	Thurne Dyke	339	70.9	18	1.83	23.9

River	Management Unit	Sediment Volume (m ³)	Non-compliant area (%)	Proportion of economically dredgable sediment (%)	Activity Index	Priority Score
Bure	Fleet Dyke	4,015	39.7	57	1.05	23.6
Thurne	Heigham Sound	5,977	57.3	36	1.08	22.6
Waveney	Beccles to Burgh St Peter	13,105	9.2	84	2.78	21.5
Ant	Upstream of Wayford Bridge	1,498	46.3	40	1.16	21.5
Bure	Horning Church to Thurne Mouth	9,631	19.2	62	1.65	19.7
Ant	Barton Broad (inside channel)	13,167	22.8	45	1.92	19.6
Thurne	Candle Dyke	306	6.2	80	3.61	17.9
Ant	Barton Broad (outside channel)	12,371	35.2	39	1.26	17.4
Bure	Waxham Cut	7,656	80.4	91	0.23	16.9
Ant	Stokesby to Herringby Hall	7,019	13.5	90	1.19	14.4
Bure	St Olaves to Breydon	7,816	4.9	90	3.03	13.4
Thurne	Thurne Mouth to Acle Bridge	3,565	9.5	54	2.48	12.7
Yare	Postwick to Brundall	20,963	14.3	86	0.95	11.6
Thurne	Meadow Dyke	1,494	45.1	43	0.54	10.6
Waveney	Geldeston to Beccles	2,769	9.3	65	1.74	10.5
Chet	Loddon to Chet Mouth	2,253	19.1	37	1.44	10.2
Yare	Reedham to Upper Seven Mile House	305	4.9	78	2.20	8.4
Waveney	Oulton Dyke	2,717	3.0	70	3.73	7.7

River	Management Unit	Sediment Volume (m ³)	Non-compliant area (%)	Proportion of economically dredgable sediment (%)	Activity Index	Priority Score
Yare	Brundall to Cantley	15,184	7.1	81	1.23	7.0
Bure	Herringby Hall to Mautby Marsh Mill	3,375	6.4	86	1.10	6.1
Bure	Thurne Mouth to Martham Ferry	1,347	4.6	44	2.62	5.2
Waveney	Burgh St Peter to St Olaves	2,233	2.1	78	2.86	4.6
Waveney	Breydon Water (inside channel)	5,165	1.6	91	1.52	2.2
Bure	Upper Seven Mile House to Breydon	823	1.3	76	2.13	2.1
Yare	Cantley to Reedham	1,914	2.2	74	1.04	1.7
Bure	Ranworth Dam	345	1.0	63	1.71	1.0