

Broads Authority

24 November 2023

Agenda item number 11

Digital Boundary

Report by GIS Officer

Purpose

The role of technology in planning will evolve, including to enable local people and stakeholders to get more involved in the process. A digital boundary map of the Broads Authority Executive Area has been created.

Broads Plan context

F4 - Provide up-to-date planning policy, site-specific allocations and planning guidance to support local community needs and ensure development happens within environmental limits.

Other priority actions in the Broads Plan will also benefit.

Recommended decisions

To note that Natural England will publish the digital boundary of the Broads Authority Executive Area.

1. Introduction

- 1.1. The Broads Authority has worked with Natural England to create a consistent digital interpretation of the Broads boundary that can be used with confidence on interactive maps. This is driven by the government's ambition to make all Local Plans digital and interactive so that users can simply click on an area or site to see what is proposed and what the constraints are. For this to work effectively the base data needs to be up to date and accurate, therefore Authority officers have been working on a project to create a digital boundary map of the Broads Authority Executive Area that can be used with confidence at large scales, and on interactive maps.
- 1.2. There is a common misconception that data displayed on an interactive map is correct at all scales. The deposited paper map shows the Broads area at 1:10000 leaving it open to interpretation at larger scales.
- 1.3. The version used by the Broads Authority was digitised circa 2006. At a similar time, Natural England digitised the National Park boundaries including the Broads. A comparison of both versions to the deposited paper map identified differences and led to the digital boundary project.

- 1.4. The paper map deposited with the Norfolk & Suffolk Broads Bill remains the legal boundary.

2. The deposited map

- 2.1. The paper map deposited with Norfolk & Suffolk Broads Bill depicting the area of the Broads Authority is held in the Parliamentary Archives. The deposited map comprises of 40 Ordnance Survey 1:10000 map sheets based on a 1:2500 survey in 1970. The Broads area is shown in pink.
- 2.2. The Broads Authority holds a copy of the '1986-1987 in Parliament set'. This set was signed by Keir Hounsome, Broads Authority Solicitor in 2010 and the note on it states 'This is the only locally held true copy of the map deposited with the Bill which led to the above Act. It is therefore the best evidence of the Broads Authority's executive area'. A separate map shows the amendment made in schedule 2 of the Broads Act.
- 2.3. The Broads Authority copy of the '1986-1987 in Parliament set' has been used for this project.

3. Digitising the boundary

- 3.1. During the early 2000's many designations were digitised from the original paper maps for use in Geographic Information Systems (GIS). Natural England shared their guidance on interpreting and digitising Landscape Designation Orders and designated site maps with the Broads Authority.
- 3.2. In the last few months, the deposited paper map was examined, and the Broads Authority GIS officer developed a specific set of interpretation to apply to the Broads area. The interpretation guide was shared and agreed with Natural England, and details the rules and examples applied to the creation of the digital boundary for the Broads (Appendix 1).
- 3.3. The deposited map sheets were scanned, georeferenced and mosaiced to create a seamless georeferenced GIS layer. The line was digitised from scratch in GIS to ensure the rules were applied consistently.
- 3.4. A literal interpretation approach was taken to determine which rule to apply. If a defining feature on the deposited map no longer existed, sections were digitised at a smaller scale using the georeferenced map sheets and research undertaken to establish the intended line as shown on the deposited map.
- 3.5. The amount of work involved to carry out the digital boundary project is huge, over the last four years, with significant input from the Planning Policy Officer and GIS Officer at the Broads Authority, and GIS Officer and Senior Advisor at Natural England.

4. Validation

- 4.1. The boundary line has been digitised at a scale of 1:1250 on OS MasterMap (downloaded November 2019). Each section was digitised and assigned the relevant rule and areas of uncertainly flagged.
- 4.2. Natural England undertook a two-stage review. A GIS Analyst checked the digitisation and interpretation rules. Flagged areas were reviewed between Natural England and the Broads Authority and issues escalated to Natural England's Senior Advisor on landscape designation boundaries to reach an agreement.

5. Conclusion

- 5.1. The revised digital interpretation of the boundary has been shared and agreed with Natural England.
- 5.2. Natural England will publish the digital boundary as they have a duty to designate the Broads area under Norfolk and Suffolk Broads Act 1988. The paper map remains the legal boundary.
- 5.3. The date of publication of the digital boundary by Natural England is not confirmed yet.
- 5.4. The Broads Authority will adopt the use of the revised dataset, when it is published by Natural England, as part of the National Parks (England) GIS dataset under the Open Government Licence. For example, we will use the revised dataset for our draft Local Plan mapping.
- 5.5. The Director of Strategic Services will notify our adjacent local authorities of the update when the digital boundary is published.

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Date of report: 31 October 2023

[Broads Plan](#) strategic objectives: F4

Appendix 1 – Interpretation guide

Broads Authority Boundary Clarification Interpretation Guide

11/08/2023

Contents

Background	2
Interpretation rules	2
Common Features	4
Data sources	5
Digitising & validation process	6
Appendix 1: Interpretation rule examples	7
Appendix 2: Common feature interpretation	9
Appendix 3: Case studies	11

Acknowledgements

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Background

The aim of this project is to prepare for the digitisation of planning and create a consistent digital interpretation of the Broads Authority (BA) boundary that can be used with confidence at large scales on interactive maps.

The version used by the Broads Authority was digitised circa 2006. At a similar time, Natural England digitised the National Park boundaries including the Broads. A comparison of both versions to the deposited paper map identified errors and led to this project.

Natural England has a duty to designate the Broads area under Norfolk and Suffolk Broads Act 1988.

The Broads Authority has worked with Natural England to create the 'digital boundary' and it will be used going forward as the best interpretation available. The deposited paper map will remain the legal boundary.

The deposited map

The map deposited with Norfolk & Suffolk Broads Bill depicting the area of the Broads Authority is held in the Parliamentary Archives. The deposited map comprises of 40 Ordnance Survey 1:10000 map sheets based on a 1:2500 survey in 1970. The Broads area is shown in pink.

The Broads Authority holds a paper copy of the '1986-1987 in parliament set'. This set was signed by Keir Hounsome, Broads Authority Solicitor in 2010 and the note on it states 'This is the only locally held true copy of the map deposited with the Bill which led to the above Act. It is therefore the best evidence of the Broads Authority's executive area'. A separate map shows the amendment made in schedule 2 of the Broads Act.

Interpretation rules

A literal approach to interpret the paper map has been taken. These rules have been developed by examining the deposited map and on advice from Natural England.

The boundary line has been digitised at a scale of 1:1250 on OS MasterMap (downloaded November 2019).

The deposited map sheets have been scanned, georeferenced and mosaiced to create a seamless layer. If a defining feature on the deposited map no longer exists, sections have been digitised at a smaller scale using the georeferenced map sheets and research undertaken to establish the intended line as shown on the deposited map.

	Scenario	Action	Notes
1	Written annotations on the map supersede the feature shown on the map		
2	Schedule 2 of the Broads Act 'Variation of the area shown on the deposited map'	Grid references and description of the boundary in schedule 2 supersede the pink area on the deposited plan.	
3	The boundary follows the same feature as shown on the definitive map and current OS MasterMap.	The boundary will be traced along the feature in OS MasterMap	
4	Where the boundary follows a single feature on the deposited map but OS MasterMap depicts more than 1 feature in close proximity	A 'hard' feature will be followed. E.g. a dyke opposed to vegetation boundary	
5	The boundary follows a feature that no longer exists or has significantly moved on current mapping.	The original alignment should be maintained unless it follows a feature that is subject to natural change e.g. Mean High Water (MHW). If no evidence of the feature can be identified on current mapping then the deposited map should be georeferenced to plot the line.	In areas where the change is the result of manmade change the current MHW line will be used opposed to georeferencing. This is specific to the Broads Authority. We understand that the intention was, and still is, for the Broads Authority's jurisdiction to follow the MHW line where it follows a manmade feature.
6	The original boundary line has been dissected by a new feature e.g. a building.	The original alignment should be maintained unless scale/historic mapping can be used to justify the inclusion/exclusion of a feature. E.g. building.	
7	The pink area follows a feature that is subject to change e.g. Mean High Water	The current line of the matching feature should be used e.g. MHW	Refer to Rule 5.

Common Features

The deposited maps are 1:10000. 1cm on the map represents 100m on the ground. Features at this scale are generalised. To ensure consistency the following interpretation rules were used for common features. Appendix 2 shows some examples.

Common features	Action
Roads on the 1:10000 are depicted as 2 black lines and do not delineate between the road surface and verge/footway.	Where the boundary follows a road, it will be snapped to the metalled edged of the road shown on OS MasterMap as this is the most permanent feature available.
On the 1:10000 map sheets drains are shown as a solid black line but on large scale mapping they are shown as a polygon.	Drains are included if the connecting network/land being drained is clearly within the pink area.
Straight lines	Straight lines between known features are replicated. They have also been used across junctions and property entrances where appropriate.
Dashed lines	If the same feature is identifiable on the ground e.g unfenced road or property extent. Then the feature has been snapped to. Historic mapping has been checked to establish if scale can be used to justify snapping to a feature in OS MasterMap. Otherwise, the line on the georeferenced map sheet has been used.

Data sources

Source	Notes
In Parliament Session – 1986 -1987 – Map book	Norfolk and Suffolk Broads (signed by Broads Authority Solicitor Kier Hounsome, 2010). 1:10,000. This set was scanned c.2006 and has been georeferenced as part of this project.
In Parliament Session – 1985 -1986 – Map book	Norfolk and Suffolk Broads (gifted by Cranfield University to the BA in 2020). 1:10000.
OS MasterMap c.2006	Topographic Line and Topographic Area. This is the set of data the 2006 boundary was digitised against.
OS 1:10,000 (last release)	
National Library for Scotland historic mapping	Map Finder - with Marker Pin - Map Images - National Library of Scotland (nls.uk)
Norfolk Historic Maps	Norfolk Historic Maps
Planning Public Access	<p>This is especially useful where development has significantly altered an area. The site location plan's often show the original alignment.</p> <p>Simple Search (broads-authority.gov.uk)</p> <p>Planning Application Search (broadland.gov.uk)</p> <p>Simple Search (south-norfolk.gov.uk)</p> <p>Great Yarmouth Borough Council (great-yarmouth.gov.uk)</p> <p>Simple Search (north-norfolk.gov.uk)</p> <p>Simple Search (eastsoffolk.gov.uk)</p>

Digitising & validation process

- Map sheets georeferenced using ArcGIS Pro, clipped and mosaiced to create a continuous layer.
- Boundary line plotted in ArcGIS Pro.
 - Each section was assigned a uniqueID, rule number and rule description. A link to relevant reference material and comments were added where research was needed.
- The dataset was reviewed by Natural England and areas of uncertainly flagged.
- Flagged areas reviewed by NE & BA GIS specialists and if agreement was not reached they were referred to Natural England's Senior Landscape Advisor.
- Once agreement had been reached a topology check of the dataset was carried out and it was converted into the boundary polygon dataset.

Appendix 1: Interpretation rule examples

1. Written annotations on the map supersede the feature shown on the map



Figure a. © Crown copyright.
Scanned deposited map annotation example

2. Schedule 2 of the Broads Act 'Variation of the area shown on the deposited map'

[Norfolk and Suffolk Broads Act 1988 \(legislation.gov.uk\)](http://legislation.gov.uk)

3. The boundary follows the same feature as shown on the definitive map and current OS MasterMap.



Figure b. © Crown copyright.

Right: Deposited map showing the pink area following the edge of a road. Right: The proposed digital boundary following the edge of the metalled road surface

4. Where the boundary follows a single feature on the deposited map but OS MasterMap depicts more than 1 feature in close proximity



Figure c. © Crown copyright.
Left: Deposited map. Right: OS MasterMap

The boundary could be following:

- The road
- The beck
- The top of the embankment

The proposed line has been drawn following the edge of The Beck. The Beck is excluded. This has been done because the pink area follows The Beck/top of the embankment to the South.

5. The boundary follows a feature that no longer exists or has significantly moved on current mapping.

The Low Wood Farm case study is an example of this.

6. The original boundary line has been dissected by a new feature

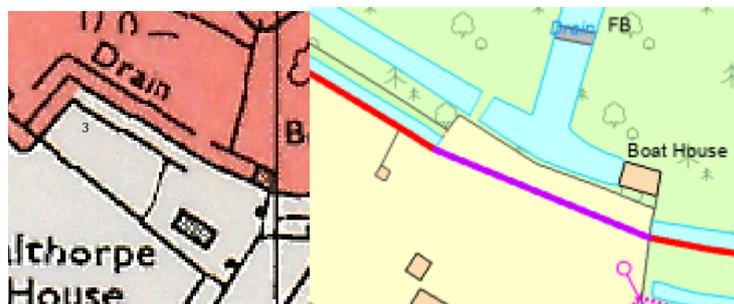


Figure d. © Crown copyright.
Left: Deposited map scan. Right: OS MasterMap

A straight line has been drawn between the two sections of drain.

7. The pink area follows a feature that is subject to change e.g. Mean High Water (MHW)

The current MHW line has been followed (OS MasterMap 2019).

Appendix 2: Common feature interpretation

Roads & Verges

A road or track on the deposited 1:10000 map is generalised and does not show the verge.



Figure e © Crown copyright.

Interpretation

The metallised edge of the road is the consistently identifiable feature.

Where the pink area clearly includes the road and large-scale mapping details a verge, the verge is excluded and vice versa

There are some exceptions to this. E. g. The Beccles bypass is not shown on the paper map but there is annotation stating 'Northern fence of the Beccles Bypass'

Drains

Drains on the deposited 1:10000 map are shown as a solid black line. On 1:1250 OS MasterMap they are shown as a polygon feature.

Interpretation

Where the edge of the pink area on the deposited map follows a drain, if the connecting network is in the pink area, the whole drain is included.

This is consistent with the Natural England Supersite Digitising guidance:

'If the original map shows the river or drain as a single line, and OS MasterMap shows it in more detail with two lines (i.e., both banks) then include both banks in the site. This should be consistent for a whole site so all bounding drains are included unless it is clear from the maps that some areas should be excluded.'

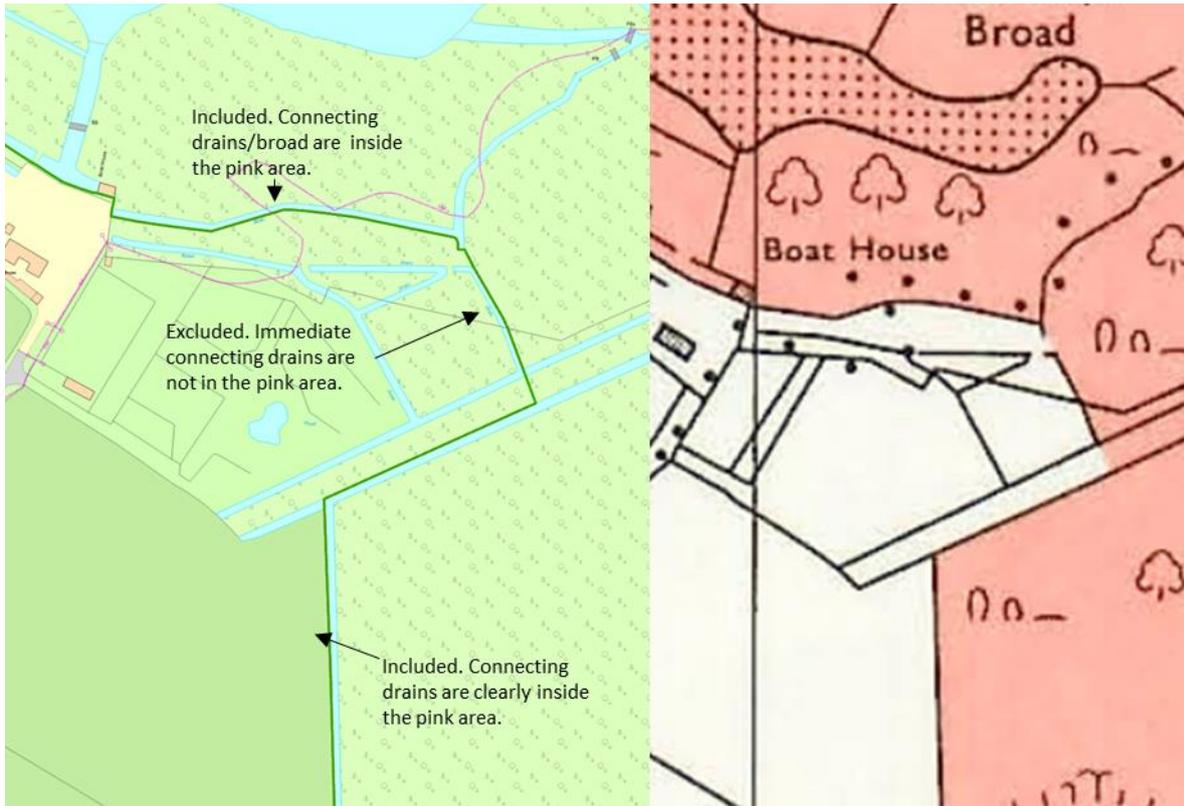


Figure f
© Crown copyright. Drain example

Appendix 3: Case studies

The following case studies are examples where further research has been undertaken to establish the alignment of the boundary.

Blackdoor Cottages, Runham, Norfolk (646182, 310958)

The deposited map dated 1986-87 shows the building and curtilage are excluded from the pink area. Current OS MasterMap does not show the original curtilage of the property. The property has been extended.

Research shows [planning permission](#) for a 2-storey extension was granted in 1992. The existing BA & NE GIS interpretations incorrectly excluded the 2-storey extension area from the Broads Authority Executive Area (see purple area/line in pink in the bottom left picture below).

The Broads Authority Executive Area was designated in 1989, 3 years before the planning permission for the extension was granted. The revised boundary line (see line in black below) has been drawn following the dashed line on OS MasterMap (original roof line) and continued in a straight line to meet a line extended from the rear boundary of the cottage next door matching the deposited map.



Figure g. © Crown copyright.

Top left: The deposited map. Top right: OS MasterMap. Bottom left: Boundary error (black line = proposed digital boundary, purple 2006 digital boundary, pink line = Natural England dataset). Bottom right: Extension planning application.

Low Wood Farm Country Cottages, Mautby, Norfolk (649540, 311821)

This area has changed significantly on the ground. Interpretation rules 5 and 6 apply. The boundary dissects the buildings. The curtilage of the property shown on the definitive map has changed and georeferencing the line is the only option available.

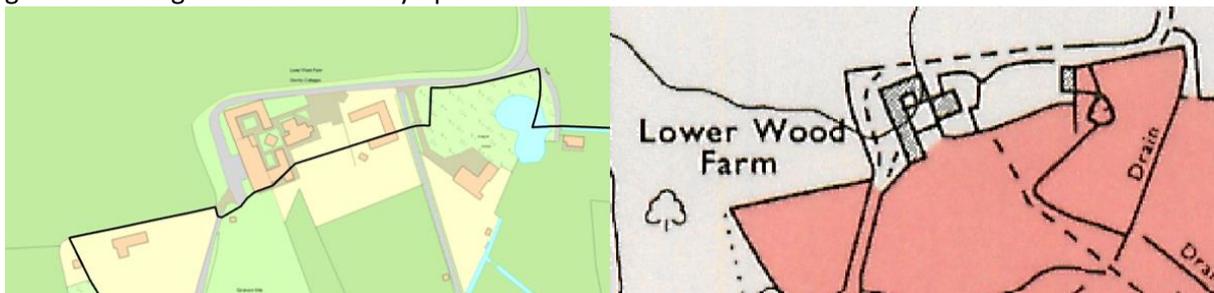


Figure k © Crown copyright.

Left: Proposed boundary and OS MasterMap. Right: Deposited map scan

Old Hall Farm, Crostwick, Norfolk (626601, 316562)

The deposited map shows a building on the edge of the boundary. Current OS MasterMap details a much smaller building.



Figure i. © Crown copyright.

Left: Scanned deposited map. Middle: OS MasterMap. Right: proposed digital boundary line and OS MasterMap

[1905 OS mapping](#) shows the original hall. A site visit concluded the building does not exist. There is a small derelict building to the left of the boundary line, but no other building remains. The boundary line has been continued in a straight line between the end of the fence line in OS MasterMap and the woodland.

