

Lake Restoration Action Plan 2016/17 – 2021/22
Report by Senior Ecologist and Director of Operations

Summary: A Lake Restoration Action Plan has been formed follow on from the scientific Lake Review (2015) and based on the prioritisation adopted Lake Restoration Strategy (2008). The Action Plan has been drawn up with key partners. Both large and small-scale lake restoration projects are ongoing and planned in the Broads. These combined efforts put the Broads as a national and international leader in lake restoration. This report also updates members on the progress made on the Hickling Broad Enhancement Project towards delivery of the Strategic priority.

1 Introduction

- 1.1 The importance of healthy lake ecosystems for wildlife, economy, society is well evidenced through local (e.g. Broads Ecosystem Accounting, Lake Restoration Strategy), national (e.g. England Biodiversity Strategy) and international policy and guidance (e.g. Water Framework Directive).
- 1.2 At previous meetings the Broads Forum and Broads Authority have noted and endorsed the Guiding Strategies of the Lake Restoration Strategy (2008) and Biodiversity and Water Strategy (2013), which inform the Broads Plan.
- 1.3 There is a need for a new Action Plan for lake restoration from 2015/16 to 2021/22, to follow on from the scientific Lake Review (2015) and based on the prioritisation adopted Lake Restoration Strategy.

2 The Lake Restoration Action Plan

- 2.1 The Action Plan draws on a diverse range of information sources that allowed waterbodies to be prioritised for restoration work, based on ecological and environmental data generated by the Broads Authority, Environment Agency, Natural England and a number of commercial partners.
- 2.2 The Broads Authority, Environment Agency, Natural England, Norfolk Wildlife Trust and Essex and Suffolk Water have been involved in drawing up this Action Plan. Partners have completed the following:
 - Agree actions/measures on a lake by lake basis. (Appendix - tabulated actions for each lake)
 - Prioritise actions/measures
 - Set plans for priority actions not currently being implemented

- 2.3 Partners agreed for the Broads Authority to update the Lake Restoration Strategy Action Plan and report via partner working groups (such as the Broads Biodiversity Group) and Broads Authority Committees (such as the Broads Forum). Some projects within the Action Plan have already been reported via separate Committee reports (Hickling and Hoveton Great Broad).
- 2.4 Members are invited to note the context for further investment in lake restoration and management along with the Action Plan for lake restoration and monitoring and comments are welcome. Members are also asked to express support for the continuing partnership work on the existing programme of work and work towards securing funding for further lake restoration projects, particularly where they benefit multiple objectives.

3 Hickling Broad enhancement project

- 3.1 Members received a report in July 2015 which outlined the project proposal and sought the views of members in refining the project. Members welcomed the report and the overall expression was that they were in favour of the project. Subsequent meetings of the Navigation Committee and Broads Authority similarly supported the project and approved the further development and delivery of the first stage of the work.
- 3.2 Over the winter 15/16 bank protection works were undertaken at Hill Common in order to reduce active bank erosion, and trialled the use of Nicospan for such works. Urgent dredging work was undertaken between November 2015 and February 2016 in order to improve access to the Pleasure Boat Dyke and local businesses, and 3,450m³ of sediment was removed. The sediment was used to complete the filling of the sediment lagoons at Duck Broad previously constructed as part of the Prisma project as well as the Hill Common site. Additionally, dredging of reed rhizome from angling platforms on the River Thurne was also undertaken and used to top up the lagoons to promote rapid vegetation growth.
- 3.3 Throughout the period water quality monitoring was undertaken on a regular basis, with fortnightly reports provided to stakeholders, which were well received. The data produced showed that there were no prymnesium events to trigger mitigations. It also showed that the use of the 'moon pool' surrounding the excavator bucket was beneficial in reducing suspended solids.
- 3.4 Further to the success of these works, the Project group which includes Norfolk Wildlife Trust has developed the next stage of planned enhancements. These are currently the subject of a planning application which is being handled by NPS on behalf of the Broads Authority. This includes work to restore lost reed bed in the Churchill's Bay and The Studio areas of Hickling, which has received the support of the Upper Thurne Working Group and Navigation Committee, and will allow further dredging to be undertaken from the navigation channel. The application also includes proposed installation of silt curtain along vulnerable reaches of bank, this will

enable monitoring to identify whether reed bed protection can be achieved with a more minimal intervention in future (see Appendix 2).

- 3.5 It is hoped that the planning application will be considered by the Planning Committee on 19 August, and the views of this Committee will be reported to the Planning Officer to consider. Works are expected to take place between November 2016 – February 2017, but will be subject to achieving the necessary environmental conditions as agreed with Natural England.
- 3.6 To support the delivery of the wider Vision for Hickling enhancement work, in particular looking at the land management in the wider catchment which impacts on peat soils and water quality, the Broads Authority is working with partners on a bid for European funding. An expression of interest for ‘Creating A New Approach to Peatland Ecosystems’ (CANAPÉ) was submitted in March, with a decision expected by September. However, in light of the referendum result there is now considerable uncertainty as to the eligibility of projects involving the UK, and alternative sources of funding will need to be explored. RSPB, as lead partner, are currently reviewing the position.

Background papers:	Report to Broads Forum
Author:	Andrea Kelly/ Trudi Wakelin
Date of report:	29 June 2016
Broads Plan Objectives:	BD1, BD2, BD3, BD4, NA1
Appendices:	APPENDIX 1 – Lake Restoration Action Plan 2016/17 – 2021/22 APPENDIX 2 – Plan view on proposed enhancement areas, Hickling enhancement project

Lake Restoration Action Plan 2016/17 – 2021/22**1. Introduction**

The Lake Restoration Strategy published by the Broads Authority in 2008 clearly sets out the key challenges and principles guiding the Authority's approach to lake restoration in the Broads. The evidence to guide and inform action is set out in the 'review of lake restoration practices and their performance in the Broads' (2015).

This Action Plan uses the prioritisation adopted in the Lake Restoration Strategy of resources allocated through a risk-based approach, ensuring statutory waterbody targets are met, and enhancement is made of existing good quality sites. The strategy provides a framework for the sustainable long-term management for the Broads, in the face of pressures such as climate change and predicted sea-level rise. This Action Plan assumes that the reader is familiar with the Strategy and simply sets out what needs to be done to achieve the objectives of the Strategy in terms of priority, timescales, costs and partnerships involved.

Analysis of a diverse range of information sources has allowed waterbodies to be prioritised for restoration work, based on ecological and environmental data generated by the Broads Authority, Environment Agency, Natural England and a number of commercial partners.

The Action Plan will be updated as required to review progress and incorporate new information or changing circumstances, including changes to waterbody condition, which may affect prioritisation or delivery of works. These updates will be reported within the Broads Authority committee cycle and placed on the Broads Authority website.

Legislative drivers influencing the restoration work in the shallow lakes of the Broads includes meeting waterbody targets set by the European Union Water Framework Directive (WFD) (2000/60/EC), achieving Favourable Conservation Status for Natura 2000 sites and Public Service Agreement (PSA) targets for waterbodies within Sites of Special Scientific Interest (SSSIs).

This annual Action Plan details the specific investment plans and projects planned for 2016/17 to 2021/22, as prioritised through the Lake Restoration Strategy framework.

Actions for lakes will also help deliver the objectives in the Broads Biodiversity and Water Strategy (2013), which works on a partnership basis, to identify local priorities and to determine the contribution that can be made locally to the delivery of national England Biodiversity Strategy outcome measures. As such, where actions arising from the Lake Restoration Strategy can positively benefit specific Habitat or Species Action Plans important for conservation in the Broads, then these actions will be considered a priority.

2. Lake restoration Actions

Generation of a five year list (2016/17 to 2021/22) of active and potential restoration projects, or actions, which the Broads Authority can take a role in delivering, is given in (Appendix 1). Input to this list of actions within a specific steering group of members from the Broads Biodiversity Group Partnership and Broadland Catchment Partnership and in consultation with Natural England (NE), Environment Agency (EA) and Norfolk Wildlife Trust (NWT) in particular.

The Action Plan includes in-lake restoration works only. There is an aim for the Broadland Catchment Partnership to develop a webmap of wider catchment measures influencing, for example, diffuse water pollution and fish habitat enhancements. The in-lake restoration measures demonstrate the multi-task approach to many of the projects, with feasibility and research work included in the early stages of restoration work at individual sites.

The Action Plan is not intended to provide a comprehensive list of all the lake restoration work that may be undertaken in the Broads, and does not include many routine operations, such as monitoring, invasive species awareness raising and control, pollution prevention with good practice antifoul use and maintenance of trees and scrub at the lake edge. The Lake Restoration Strategy and this updated Action Plan sits within the main Broads Plan to address priority issues that have been identified by some landowners and partners, and on which they are prepared to commit time and resources over the lifetime of the plan. The proposed actions are at different stages, and more ideas may emerge through the development of the life of the plan and through ongoing partnership working with relevant organisations, groups and communities.

The actions are identified to help meet 'good ecological status/potential' as defined by the Water Framework Directive, including 'favourable condition' as defined by the Habitats Directive. Regular monitoring as part of each scheme will highlight any need for changes to the actions and the reasons for them.

3. Prioritisation of Actions

Specific waterbodies have been prioritised for action within the Strategy, based on a matrix of the probability of success of restoration and the risk from saline incursion or breach. Potential restoration projects vary in scale between site specific work and sub-catchment actions. Prioritisation of actions has been based on a matrix of the timescale for delivery (see Table 1) and the impact of the project in reducing the identified pressure (effectiveness of measure). The waterbody priorities published in the Lake Restoration Strategy are used as an additional filter to rank projects of similar overall effectiveness, to ensure that actions at the highest priority sites and of greatest effectiveness are clearly identified. Table 1 shows the scoring method to rank each individual action.

Table 1. Effectiveness matrix guiding prioritisation of Actions

IMPACT	TIMESCALE TO DELIVER KEY			KEY
	Short	Medium	Long	Priority for delivery
	<1 yr	2-3 yrs	>3 yrs	
High				HIGH
Medium				MEDIUM
Low				LOW

The Lake Restoration Strategy outlines a “portfolio” approach, whereby a range of projects are to be selected, so as to avoid investing predominantly in “quick win” projects. This enables investment to be spread widely, securing the best possible outcomes for waterbodies across the Broads in the short and longer terms.

4. Water Framework Directive

This Strategy focuses on new and ongoing local in-lake restoration measures that require further action. These are referred to as local measures by the WFD River Basin Management Plan (RBMP). National measures such as Water Protection Zones, Water Company spending review, Review of Consents and the Catchment Sensitive Farming Initiative are not considered in the Lake Restoration Strategy. However, the local actions need to be cross referenced to the national measures in the RBMP, and ensure the Broads is prioritised as a target area for national measures. The measures listed Appendix 1 are designed to be ambitious and challenging and realistic and not so aspirational that they are therefore unachievable.

Measures that are assessed as not technically feasible or disproportionately expensive have not been included in this Action Plan.

Since the Lake Restoration Strategy (2008), the combined measures have not, for the majority of broads, achieved the waterbodies targets in the first WFD cycle 2008-2015. This is very likely to be a result of a combination of factors such as the continued inputs and cycling of nutrients, poor littoral margin habitat and lack of water plants and in some cases their propagules (see Lake Review, 2015). These factors result in long response lag of shallow lake ecosystems. Thus the achievement of objectives will continue into the following River Basin Cycles to 2027.

5. Review

It is intended that the work programme will be reviewed annually, to monitor the progress of delivery, and ensure actions are appropriately prioritised given new management requirements and restoration opportunities, and the ability to progress works.

Completed actions have been reported within the following reports: [Lake Review](#), [Summary of actions](#), the ongoing Action Plan is set out in Appendix 1. Consultation with the Broads Forum and Broads Biodiversity Group, Broadland Catchment Partnership members will be undertaken on an annual basis or as required.

Some of the priorities for lake restoration include the extensive in-lake work with Trinity Broads, Hoveton Great Broad and Hickling Broad. It is important that these projects are monitored to understand effectiveness of these measures. Beyond the Hoveton Great Broad Project there is future potential for further restoration via biomanipulation of other Bure Broads, for example Ranworth. Further creation of clear water areas at Barton would enhance the ongoing and gradual ecological restoration.

References

Kelly, A. (2013) Status and lake management activity in the Broads. Broads Authority Report.

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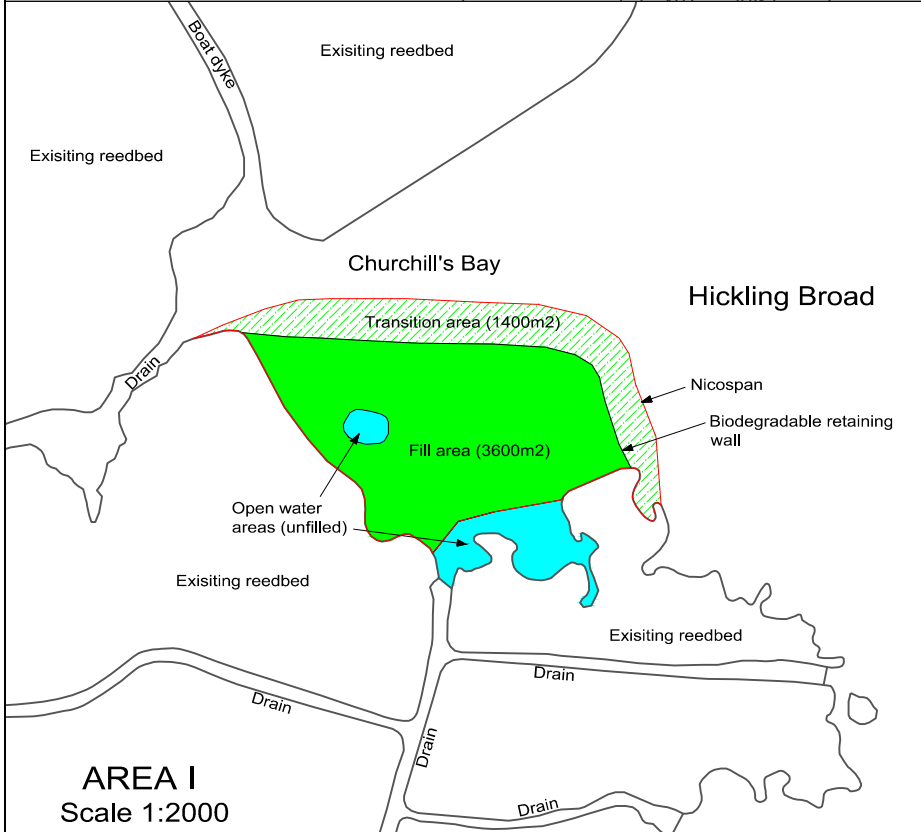
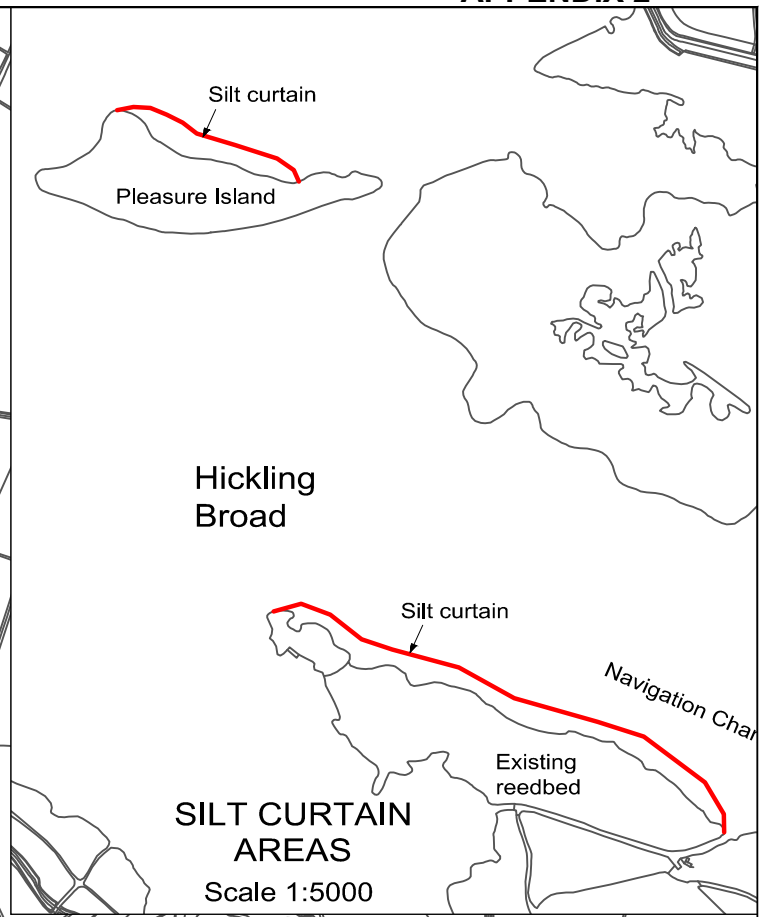
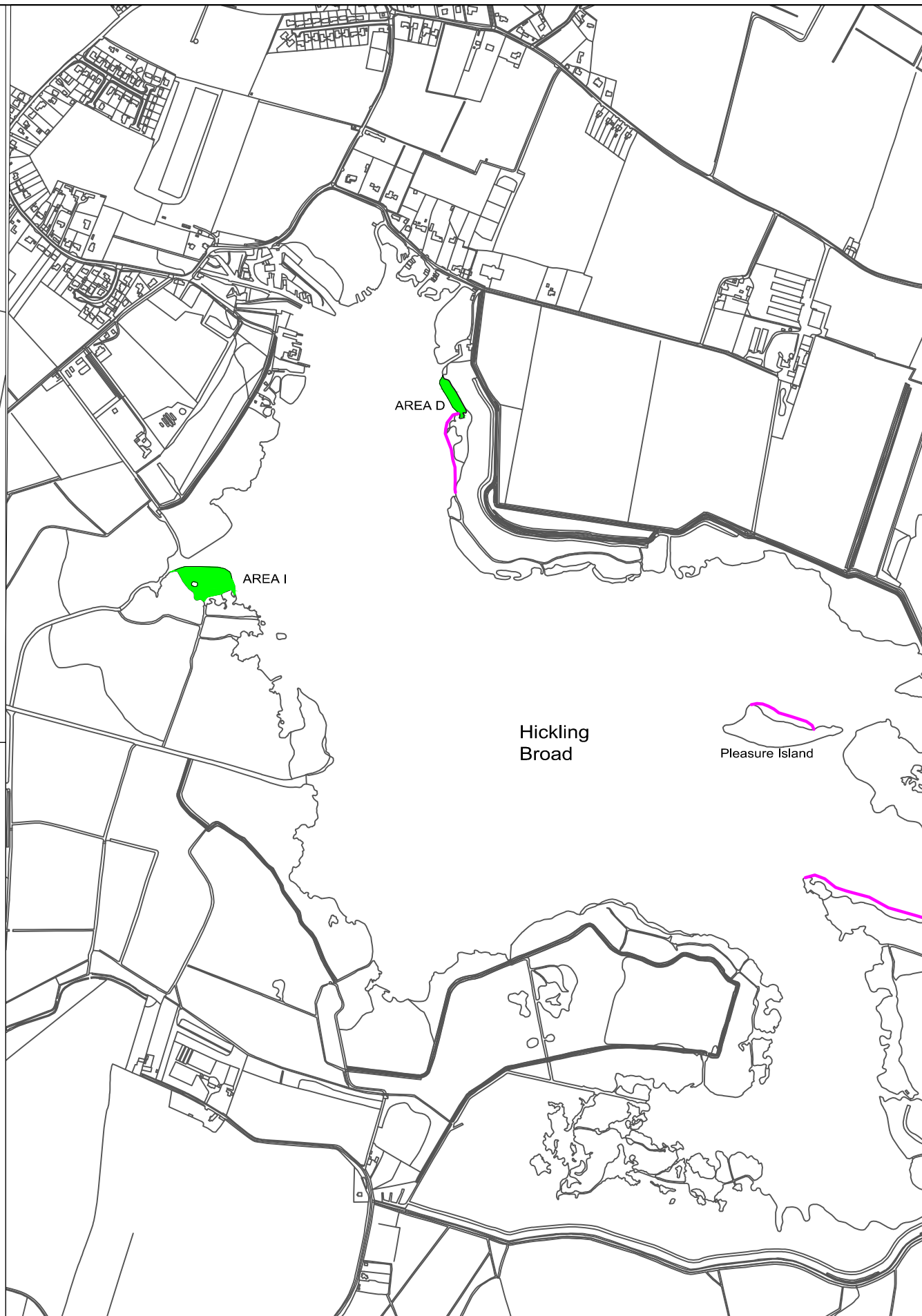
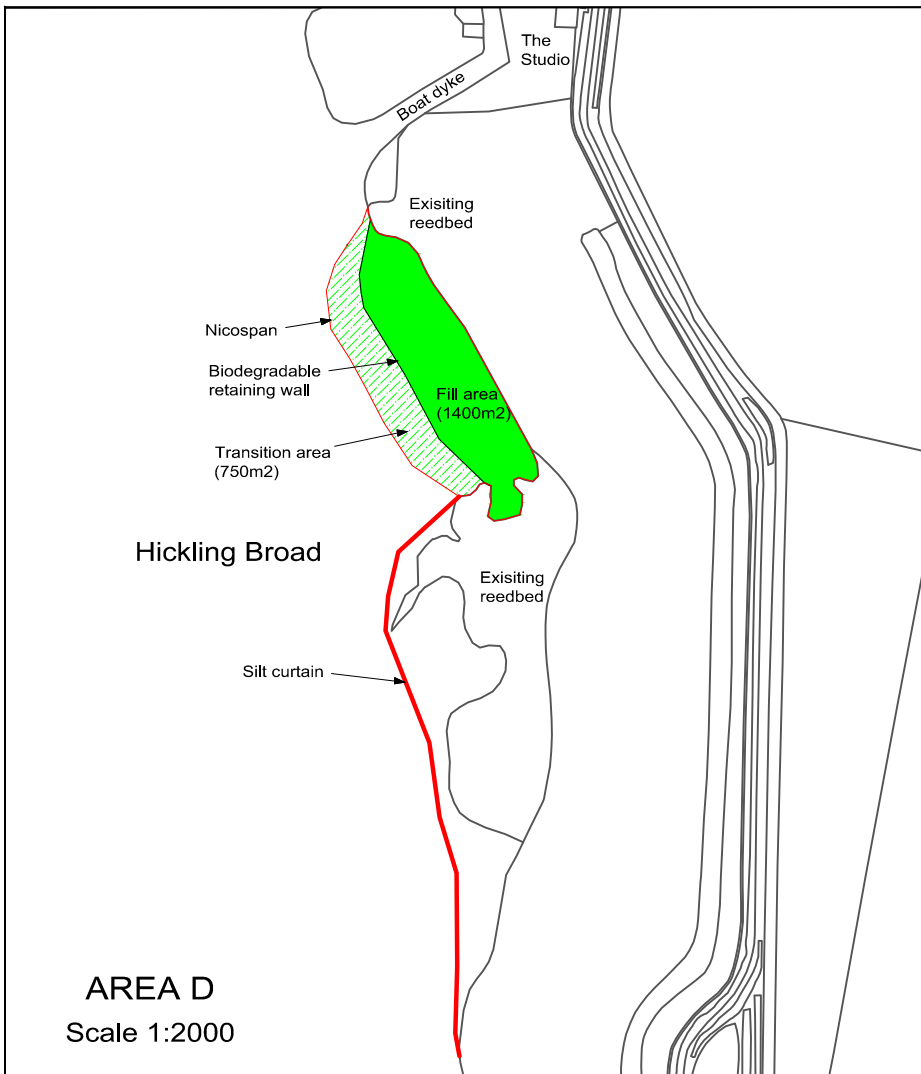
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Phillips, G., Bennion, H., Perrow, M.R., Sayer, C.D., Spears, B.M., Willby, N. (2015) A review of lake restoration practices and their performance in the Broads National Park, 1980-2013. Report for Broads Authority, Norwich and Natural England. Broads Authority.

Appendix 1

Actions	Lakes	Lake Priority / Action Priority	Timescale and lead	Costs (outside of existing resource)
Sediment removal to meet water abstraction conditions (ecological benefit not principle driver)	Trinity Broads	H / M	2017 E&SW	
Review sediment removal success	Upton Little Broad Trinity Broads (when complete)	H / H H / M	2017 BA/NWT 2020 E&SW	
Review of management and sediment removal	Round Water and Woolners Carr	H / M	2017 NE/SWT	
Specific small catchment nutrient input projects - Review of domestic sewage input and investigation of first time rural sewerage - Projects to reduce diffuse pollution in the Whitton Run, informing benefit of connection to Strumpshaw Broad	Cromes Broad Strumpshaw Broad /Whitton Run	M / H M / H	2016 BA 2017-20 RSPB/NRT/EA	1,000 TBC
Review of evidence collected for the Brograve trials and set out next steps for water level management Review of water quality from pumped input with land use change	Upper Thurne Broads	M / H	2016 WMA TBC EA/WMA	TBC TBC
Complete initial littoral margin enhancement Secure funding for and deliver larger littoral margin enhancement scheme	Hickling	M / M M / M	2016-2018 BA 2017-2022 BA	697,214
Complete reed island creation and review the evidence to assess its function	Heigham Sound	M / M	2016 BA	
Extensive sediment removal and biomanipulation project	Hoveton Great	M / H	2018/19 NE	

Continue with biomanipulation within barriers and review in 2017	Barton	M / M	2016/17 BA	
Complete a feasibility study of further options if there's no improvement to the general ecological condition of the broad		M / H	2017 BA/NWT	
Biomanipulation likely to be successful if agreements and funding can be secured	Burntfen	M / H	TBC	10,000
	Fritton Lake	M / H	TBC	50,000
	Sotshole	M / H	2016/17	10,000 all estimates
Littoral margin enhancements	Wroxham	M / M	TBC	TBC
Continue with biomanipulation within fish barrier and review in 2017. Site is a candidate for innovative biofiltration via farmed system, although further evidence is required to inform this option	Ranworth	L / H	2016/17 BA/NWT	
		L / M	TBC	TBC
Protection of floating reed islands with goose protection and erosion protection curtains	Rockland	L / M	2016/17 BA	13,000
Further sediment removal required as shallowing is ongoing	Wheatfen	L / M	TBC	TBC



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GENERAL NOTES:

REVISION COMMENT BOX

Rev.	Date	Rev by.	Chk by

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Project Title Hickling Broad Edge Enhancements 2016

Drawing Title Plan View on Proposed Enhancement Areas

Date Drawn 28/04/16	Drawing Scale As shown @ A3
Drawn By TJH	Drawing No BA/HB2016/007
Approval status	Rev P1