

Broads Water Plant Survey Results

Report by Environment Officer and Environment and Design Supervisor

Summary: This report presents and discusses the findings from the annual water plant survey carried out during 2015. A total of 28 broads were surveyed using a standard rake sampling technique. Waxham Cut, as a navigable channel was surveyed for water plants, using a similar methodology, but specifically developed for rivers and channels. Barton and Hickling broads were surveyed using hydroacoustic survey equipment, to gain greater accuracy and resolution of the volume of water plants growing in the water, and their spatial extent over the bed of these broads.

The full survey report is available for Members to read at:
<http://www.broads-authority.gov.uk/WaterPlantReportDraft2015>

Recommendation: That the use of the new methodology and the findings for the survey are noted.

1 Introduction

- 1.1 The Broads Authority has been surveying water plants within the open water bodies of the Broads since 1983 and has consequently collated a valuable dataset which allows monitoring and analysis of long term trends of aquatic plants across the system. This report summarises the key findings of the annual water plant surveys completed in July to August 2015.
- 1.2 2014 saw the full adoption of a point based survey for the broads, where the water plants are physically sampled from a boat by using a double headed rake dragged a standard five metre length, at fixed points around the broad. The previous methodology involved dragging the rake over variable length transects, anywhere from 10 to 120 metres long. The previously used “rake transect” method is suitable where small volumes of plants are present, as similar to the conditions in most Broads during the early 1980s, when the survey was first conceived. However, where high plant volumes are now increasingly present, such as broads like Martham South, Alderfen, Cockshoot and Whitlingham, it became increasingly difficult to apply the methodology in an accurate, robust and comparable manner. In order to resolve this issue the Broads Authority and academic partners involved in the data usage, refined a point based methodology developed on the Trinity Broads, for wider application across all the broads. Verification of the

approach was gained through conducting duplicate surveys of particular broads using the transect method and a new point based method.

- 1.3 This report also presents findings from a revised survey methodology and new programme of surveys for navigable river reaches. Some species abundance surveys were carried out in the mid 2000's in the upper reaches of the Navigation Area. The new method which has been developed is again based on standard rake sampling at fixed points, so the abundance data is robust and comparable between sites and survey years. In 2015 Waxham Cut was selected to develop the methodology and the first year's results were successfully recorded.
- 1.4 Hydroacoustic survey data showing the volume of plants in the water column, and their spatial coverage across the bed of the broads, is also presented for Barton and Hickling.

2 Key Findings of the Annual Water Plant Survey 2015

- 2.1 In response to the recent and on-going trend of mild winters and springs, and the subsequent earlier growing season for various species, the start of the survey season has been brought forward by two weeks to begin in early July and to conclude by the end of August. This slight shift ensures the peak growth of water plants is captured during the survey period.
- 2.2 This year has seen a shift in dominant species in a number of regularly surveyed broads. However, it must be noted that water plants can be very variable between years and between broads. The underlying cause why a certain plant species out-competes another in a particular year can be related to a whole host of reasons including: earlier growing season, water levels, nutrient availability, etc. Those broads which had a change in dominant species were: Alderfen, Buckenham, Heigham Sound, Hickling, Rockland and Whitlingham Little.
- 2.3 The pondweed species (*Potamogeton sp*) did not have a very productive year, with lower species numbers and reduced abundance, compared to recent years. The growing conditions early in the season when these species make most of their growth may have been a factor.
- 2.4 Hickling Broad had a vigorous year for overall water plant abundance. Stonewort beds extended over most areas of the broad, but with relatively low height, other than in the most sheltered bays.
- 2.5 At the Martham broads, the North Broad had a reduction in the number of species found this year, as bristly stonewort was very vigorous, at the expense of the previously dominant starry stonewort. In comparison the South Broad was relatively stable in terms of species present and overall growth levels.

- 2.6 Cockshoot has seen very interesting this year, with a big reduction in species numbers, with only two species found in the broad this year. The broad contained an almost monoculture of the nationally scarce holly-leaved naiad, with a small amount of rigid hornwort.
- 2.7 Sotshole Broad was formally surveyed this year for the first time using the standard methodology. Following extensive restoration work by the landowner, three species of water plant were found. It is early days in the recovery of this small site and hopefully a broader range of water plants will colonise over time.
- 2.8 Wroxham Broad's species richness was very low, with small amounts of only two species found this year.
- 2.9 Whitlingham Great Broad continues to have an impressive number of different species, however the 2015 abundance figures appear to be lower than in recent years. Whitlingham Little Broad appears to be decreasing slightly in terms of the number of species present and the total water plant abundance. The annual presence of blue-green algae at this site is an on-going challenge for any water plant growth.

3 Conclusions and future applications

- 3.1 Given the change in survey methodology, the future presentation of long term water plant trends at broads sites will require careful consideration. The Authority is still working with academic partners to finalise the data processing technique that will provide the optimal presentation of these long term trends. This will allow annual trend analysis with water quality data for example, to assess ecological response to changes in water quality.
- 3.2 A range of upper river reaches will be surveyed on rotation each year, with a minimum of two sites per year. The previously surveyed sites include the River Bure (Coltishall Lock to Belaugh); River Thurne (West Somerton to Martham Ferry); River Ant (Tyler's Cut); River Wensum/Yare (New Mills to Whitlingham Broad); River Waveney (Geldeston Lock to Beccles). Over the past few years, the Authority's weed-harvester operators report increasing volumes of cut plant material coming out of the navigable reaches. In addition, they have to extend the cutting areas, as water plant growth is increasing in areas that have not been cut in recent times.
- 3.3 The combination of rake based surveys to positively identify species present, and hydroacoustic surveys to accurately record overall plant growth at a high resolution, is a very powerful tool for guiding site management. Prioritisation of areas for restoration and ecological enhancement work is made possible, such as at Hickling Broad. Where water plant growth is raised as an impact on navigational access, analysis of plant growth over the whole site is critical to establish impacts in European Protected sites and interest features, such as at both Barton and Hickling.

Background papers: Draft 2015 Water Plant Survey Report 2015
<http://www.broads-authority.gov.uk/WaterPlantReportDraft2015>

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Broads Plan Objectives: BD4, BD6, NA3

Appendices: None