

## **2016 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 summer 2016. A total of 28 broads were surveyed using a standard rake sampling technique. The River Waveney upstream of Beccles was surveyed for water plants, using a similar rake methodology, but specifically developed for rivers and linear 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 Forum members to read and comments on this draft are welcomed. The web link below takes you to the page where the 2016 Broads Water plant Survey Report is available, with the pdf for the report listed under the “Annual water plant monitoring reports”.

<http://www.broads-authority.gov.uk/news-and-publications/publications-and-reports/conservation-publications-and-reports/water-conservation-reports>

### **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 terms trends of aquatic plants across the system. This report summarises the key findings of the annual water plant surveys completed in July to August 2016.
- 1.2 The revised Broads point survey method has been fully adopted and in use for the past three years. The data can now be compared in a more meaningful way between sites and years. The charts presented in the main report give a visual display of the point survey results for each regularly surveyed broad. Also included for each site is a table of abundance values for each species recorded.
- 1.3 This report also presents findings from a two other surveys, a river plant survey and the hydroacoustic survey.
- 1.4 The revised river plant survey method was used on the upper navigable reaches of the River Waveney (Geldeston Lock to Beccles). Each main river with water plant growth present is on a rotational survey schedule, with each river stretch being surveyed at least once every five years.

1.5 Hydroacoustic surveys show the volume of plants in the water column, and their spatial coverage across the bed of the broads. These surveys were carried out in Barton and Hickling Broads in June. The methodology involves a survey grid crossing the entire width of each broad to gain sufficient accuracy and coverage. In addition a second survey was conducted on Hickling Broad in October.

## **2 Key Findings of the Annual Water Plant Survey 2016**

2.1 Once again in response to the recent and on-going trend of mild winters and springs, and an earlier growing season, the start of the broad's surveys began in early July and continued until the end of August. This is about two weeks earlier than surveys carried out prior to 2014. 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 few of the regularly surveyed broads. However, it must be noted that water plants can be very variable between years and between broads, hence the value of a long-term monitoring strategy. The underlying cause why a certain plant species outcompetes another in a particular year can be related to a whole host of reasons including; competition for light early in the growth season; water levels; nutrient availability, etc. Those broads which had a change in dominant species were; Decoy Broad, Mautby Decoy, Rockland Broad, and Whitlingham Little Broad.

2.3 Blackfleet Broad was surveyed this year; it has been ten years since it was surveyed last. Blackfleet is located between Horsey Mere and Heigham Sound, adjacent to Meadow dyke. The site is dominated by stonewort species and appears to be a relatively stable site for this type of plant growth in the Upper Thurne.

2.4 The broads which showed a noticeable decrease in abundance scores over the past three years include Cockshoot Broad, Cromes Broad and Upton Little Broad.

2.4.1 Cockshoot appeared to have had a 64% decrease in holly-leaved naiad abundance compared to 2015. This could be due to the natural environmental conditions not being ideal here in 2016.

2.4.2 Cromes has had a decrease in the abundance of stoneworts over the past three years, over 50% from 2014 to 2015 and then a further decrease in 2016. The increased levels of filamentous algae found in 2015 and 2016 appear to have been at the expense of the vascular plants and stoneworts. Due to this increase in filamentous algae and decrease in the rarer plants, nutrient enrichment may be one possible cause, alongside natural variability in plant species abundances. An investigation into the water quality data is suggested to help determine the significance of external nutrient sources on water plant growth.

- 2.4.3 Upton Little has had a large decrease in the quantity of stoneworts surveyed since 2014. This trend is suggestive of an on-going stabilisation of the plant community following the huge explosion of stoneworts immediately following the mudpumping in 2011.
- 2.5 Over the past three years broads which showed a noticeable increase in their abundance scores include; Alderfen Broad, Decoy Broad and Little Broad. Alderfen has returned to a condition similar to that from 2014 although without the same quantity of stonewort. Decoy has an increased number of species recorded and the quantities therein. At Little Broad, stoneworts have returned in moderate numbers although not to the same peak in growth found in 2010 and the years immediately after mud pumping in 2008.
- 2.6 At Wroxham Broad a species which had not been recorded since 2011 has resurfaced, horned pondweed, *Zannichellia palustris*, and was found at three points within the broad, albeit in small amounts.
- 2.7 The River Waveney was surveyed this year, the areas selected were Geldeston Dyke and then through Beccles.
- 2.8 The hydroacoustic survey has shown that the early season surveys conducted in June on Barton and Hickling show similar results in terms of water plant abundance to those conducted in 2015. The additional survey at Hickling in October 2016 did show that the percentage of the bed covered by plants had increased along with their percentage volume within the water column. The good weather and extended growth period in the autumn allowed the plants to keep growing for longer, with clear water conditions observed within the stonewort beds in the west of the Broad.

### **3 Conclusions and Future Applications**

- 3.1 Now that there is a three year data set for the point based survey method, recent trends can be looked at more easily. However this data set is still only three years old and caution is advised in inferring longer term patterns from the sometimes high variability in growth of particular species between years.
- 3.2 The comparison of plant abundance between sites has been facilitated through adopting the point based sampling methodology. The graphs presented in section 3.3 of the main report highlight for example the relatively poor growth of water plants in Barton Broad and Horsey Mere, which are a long way off meeting their SSSI conservation targets. At the other end of the scale Martham South and North broads both had very strong stonewort populations over the majority of their beds, as is expected for shallow lake sites with good water quality.
- 3.3 The forward plan to rotationally survey two river sites each year is an important aim for these surveys. There has been increasing demand on the weed harvester operation and continued reports on increased water plant growth having an impacting on navigational access in specific areas. The key sites include the River Bure (Coltishall Lock to Belaugh); River Thurne (West Somerton to Martham Ferry; Waxham Cut & Catfield Dyke); River Ant (Tyler's

Cut); River Wensum/Yare (New Mills to Whitlingham Broad); River Waveney (Geldeston Lock to Beccles). Observing the trends and species present at these sites will assist the sustainable management of these areas and strike a good balance between navigational access and ecological functioning. As water quality continues to improve and water plant growth responds accordingly, the challenge of managing appropriate water depth and safe navigation also continues.

- 3.4 The combination of rake based surveys and hydroacoustic surveys continue to be a very powerful tool for guiding site management, such as prioritisation of areas for restoration and ecological enhancement, e.g. Churchill's Bay at Hickling Broad. Water plant growth has been raised as an impact on navigational access, particularly sailing in Hickling Broad. The analysis of plant growth over the whole site is critical in establishing any likely impacts on this European Protected site and the conservation interest features at Hickling, before considering the possibility of managing the height of plant growth outside of the marked channel.

Background papers: see Water Plant Survey Report 2016, located on the linked page <http://www.broads-authority.gov.uk/news-and-publications/publications-and-reports/conservation-publications-and-reports/water-conservation-reports>

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