Project to increase suitable habitat for BAP priority species, grass-wrack pondweed (*Potamogeton compressus*), within the South Walsham Marshes:

Turion collection, seeding of a widened IDB dyke and species distribution surveys 2012 - 2013

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MILL HOUSE Ecology

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Contents

1 Introduction

1.1 Brief

Mill House Ecology was commissioned by Caroline Laburn of the Water Management Alliance in 2012 to undertake turion collection of grass-wrack pondweed (*Potamogeton compressus*) from an existing population in the South Walsham Marshes. The majority of the turions collected were placed immediately in a newly widened IDB dyke in the area. A proportion of the turions were stored overwinter and the receptor dyke seeded for a second time in the spring of 2013 to increase the likely success of the translocation. A subsequent survey of the species' distribution was undertaken in summer 2013.

The receptor dyke had been widened by the Broads 2006 IDB earlier in 2012 as part of a DEFRA funded project aimed at increasing habitat suitable for the BAP priority species (Laburn and Goodwin, 2012).

The seeding and distribution surveys were undertaken by Christian Whiting and Helen Booth; Helen was responsible for a previous relocation programme for the species in the soke dyke of South Walsham Marshes as part of the Broadland Flood Alleviation Project (Markwell and Halls, 2008).

A full description of the conservation status and known ecology of grass-wrack pondweed is provided in Birkenshaw *et al.,* (2013).

1.2 Site location

The widened IDB dyke is located to the south of, and roughly parallel with, the soke dyke and adjoining marsh dyke where grass-wrack pondweed is already established (Figure 1). Additional dykes to the west, adjacent to the central track, also support the species.

The IDB dyke was widened by approximately 1m as part of the habitat improvement project, and replacement of a collapsed culvert at the western end of the dyke allows potential for some through flow of water along the dyke now (Laburn and Goodwin, 2012). As a species reported as being associated with still or slow-flowing water (certainly it is associated with dykes influenced by the water control structure to the east of the South Walsham Marshes), and cited as an early coloniser of modified habitats (Birkenshaw *et al.,* 2013), the approaches taken to habitat improvement should favour the species and provide connectivity between the widened dyke and additional nearby dykes (to west) supporting existing populations (Figure 1).

2 Methodology and results

2.1 Existing distribution

A survey to map the existing distribution of grass-wrack pondweed locally to the widened dyke was carried out in August 2012 (Figure 1), which generated records in the nearby dykes consistent with observations from 2011.

2.2 Turion collection and seeding

The methods used followed Markwell and Halls (2008). Turions were collected from soke dyke lengths within 150m to the east and west of the old South Walsham pump house in September 2012, as the parent plants were beginning to senesce. Less than 30% of existing plant material was removed from any one location using grapnels. The source locations were chosen as they supported the most abundant growth of grass-wrack pondweed in the area. Three partially filled black bin liners of plant material were transferred by hand directly to the widened dyke (Photo 1), dispersed along the full length. All turions from the remaining one quarter to third of the plant material collected (Photo 2) were removed for storage over winter in sealed, blackened containers containing clean water and placed in a fridge maintained at 4˚C. This equated to approximately 100 – 150 turions.

Stored turions were transferred to the widened ditch in early April 2013 following a very cold March. During the seeding it was noted that the western half of the widened IDB dyke appeared to have more open water surface, but with water soldier (*Stratiotes aloides*) visible along the dyke bed, whilst the eastern stretch generally had a higher cover of emergent marginal vegetation, mainly common reed (*Phragmites australis*) on the south bank such that shading of the dyke can occur for parts of the day. Turions were distributed along the full dyke length, but were not placed in areas locally constricted by existing aquatic vegetation.

2.3 2013 distribution survey

2.3.1 July 2013

Distribution surveys were undertaken using a combination of visual assessment and grapnel trawls, with cover values based on the DAFOR rapid assessment method (D, dominant, = >70%; A, abundant, = 30-70%; F, frequent, = 10-30%; O, occasional, = 3-10%; R, rare, = <3%).

An initial visit was made to the site on the 9th July 2013, when all dykes surveyed in 2011 (Figure 1) were surveyed with exception of the eastern half of the widened IDB dyke where access was restricted due to the presence of a bull in the field (Figure 2).

The plant was generally recorded as per the 2011 survey, although some disturbance to the west end of its known distribution in the soke dyke due to recent BFAP flood defence works had resulted in a localised increase in turbidity and algal growth, with few plants observed in the affected reach (Figure 2).

Elsewhere an IDB marsh dyke which has in previous years supported good stands of growth (*H. Booth personal observation)* appeared to have been subject to a major winter clearance/cleaning exercise; a significant pile of dredgings including emergent vegetation was present along the bank side. The substrate of the dyke was bare mud with little grass-wrack pondweed growth (or other plants) present (Figure 2). As long as the more sensitive management approach previously employed by the IDB is used in coming years it is considered likely the population will expand again along this dyke. A number of plants of greater water parsnip (*Sium latifolium*), also a BAP species, were noted flowering along the bank margins of this dyke.

Along the western length of the widened IDB marsh dyke (Photo 3) grass-wrack pondweed was observed at a cover of between 10 and 30%, in amongst plants of water soldier which although sitting raised in the water column were not yet proud of the water surface in general (Figure 2, Photo 4).

2.3.2 *September 2013*

A repeat visit was undertaken on the 4th September 2013 (no bull present) in order to access the eastern half of the widened IDB marsh dyke (Photo 5); the western half of the dyke was also re-surveyed (Figure 3).

Along the margins of the eastern half of the widened IDB marsh dyke, emergent growth accounted for approximately 20% cover, however a fairly diverse stand of submerged aquatic taxa was also present including grass-wrack pondweed at typically 3-10% cover, although locally increasing to up to 30% cover (Figure 3, Photo 6). Some seed heads were seen and turions were abundant.

In contrast to the July survey, no grass-wrack pondweed was seen in the western half of the dyke where it had previously been recorded (Figure 3). Water soldier was now sitting very high in the water, with long stretches of the water surface dominated by the plants' emergent leaves (Photo 7). Repeated grapnel trawls yielded only one piece of grass-wrack pondweed indicating the main vegetative growth had finished. It is hoped that the plants will have had time to adapt to the changing conditions and produced mature turions prior to scenescing.

The literature indicates a potential positive association between grass-wrack pondweed and water soldier, however observations at some sites indicate the latter can replace the former (Birkenshaw *et al.,* 2013). It seems reasonable that very thick stands have the potential to cause problems for grass-wrack pondweed propagation both by reducing light levels reaching the sediments in the spring, and by forming a physical barrier above germinating turions.

Immediately following the September survey a telephone call was made to Caroline Laburn of the WMA outlining the issue with water soldier growth, suggesting consideration should be given to removal of a significant proportion of the water soldier present whilst still floating high in the water column (*cf.* typical

dyke clearance operations which are generally winter led when the plant has sunk to the dyke bed). The use of a Bradshaw bucket or similar would allow any turions (and other seeds and macroinvertebrates) present to remain largely undisturbed in the sediments ready for the 2014 growing season. Ongoing monitoring of the relevant stretch is also recommended to determine the effect of water soldier growth upon grass-wrack pondweed.

3 Conclusions

3.1 Project status

On the basis of the two surveys undertaken in 2013, the seeding exercise of the widened IDB marsh dyke is considered a success as plants have been established along the full length.

It is anticipated that the population should be maintained into future years, as numerous turions were present during the September survey. Ongoing monitoring is recommended, in particular to assess the impact of water soldier growth along the western stretch of the dyke.

3.2 Future management

It is recommended that an appropriate management prescription be provided by the WMA for the widened IDB dyke in order to maintain the necessary conditions for grass-wrack pondweed growth. Such management prescriptions have been successfully prescribed in the South Walsham Marshes area in previous years and are discussed in Birkenshaw *et al.,* (2013).

In light of the water soldier growth observed in 2013, it is recommended that an additional distribution survey is undertaken in 2014, and onwards into 2015 if growth appears reduced in comparison to 2013. If the grass-wrack pondweed population is maintained at its 2013 distribution, future bi-annual or every third year surveys of this and other IDB dykes supporting the species would help to ensure an ongoing balance is achieved between keeping the dyke open and clearance being not too extreme.

4 References

Birkenshaw, N., Kemp, E. and Clarke, S. 2013. The ecology of grass-wrack pondweed *Potamogeton compressus*. Natural England Commissioned Reports, Number 130.

Laburn, C., and Goodwin, T. (2012) Project to increase the suitable habitat for BAP priority species, grass-wrack pondweed *Potamogeon compressus,* within the South Walsham Marshes: progress report. WMA. Broads (2006) IDB.

Markwell H.J. and Halls J.M. (2008) Translocation of a nationally scarce aquatic plant, grass-wrack pondweed *Potamogeton compressus*, at South Walsham Marshes, Norfolk, England. *Conservation Evidence*, 5, 69-73.

Figures

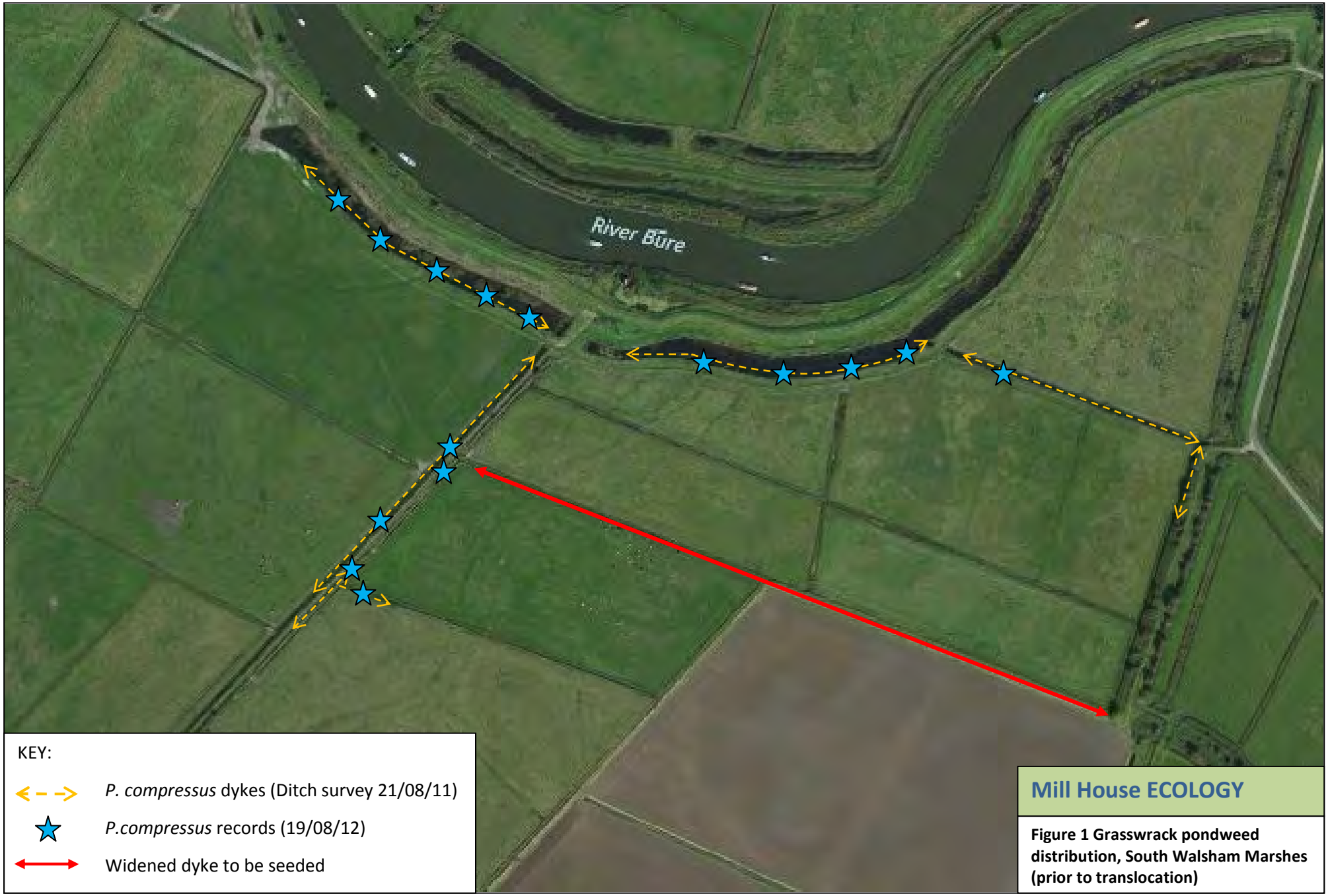

Figure 1 Grasswrack pondweed distribution, South Walsham Marshes (prior to translocation)

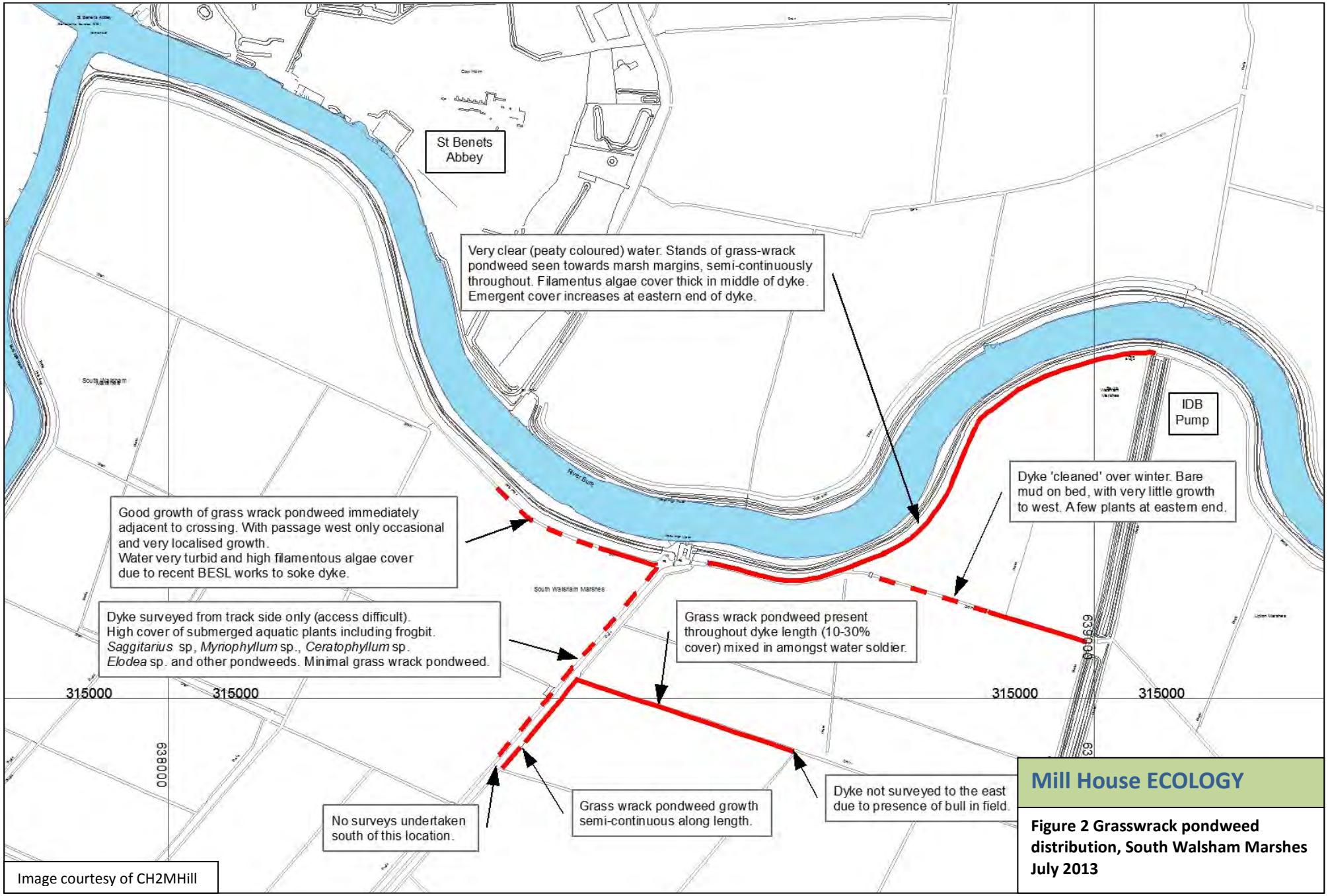

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Figure 2 Grasswrack pondweed distribution, South Walsham Marshes July 2013

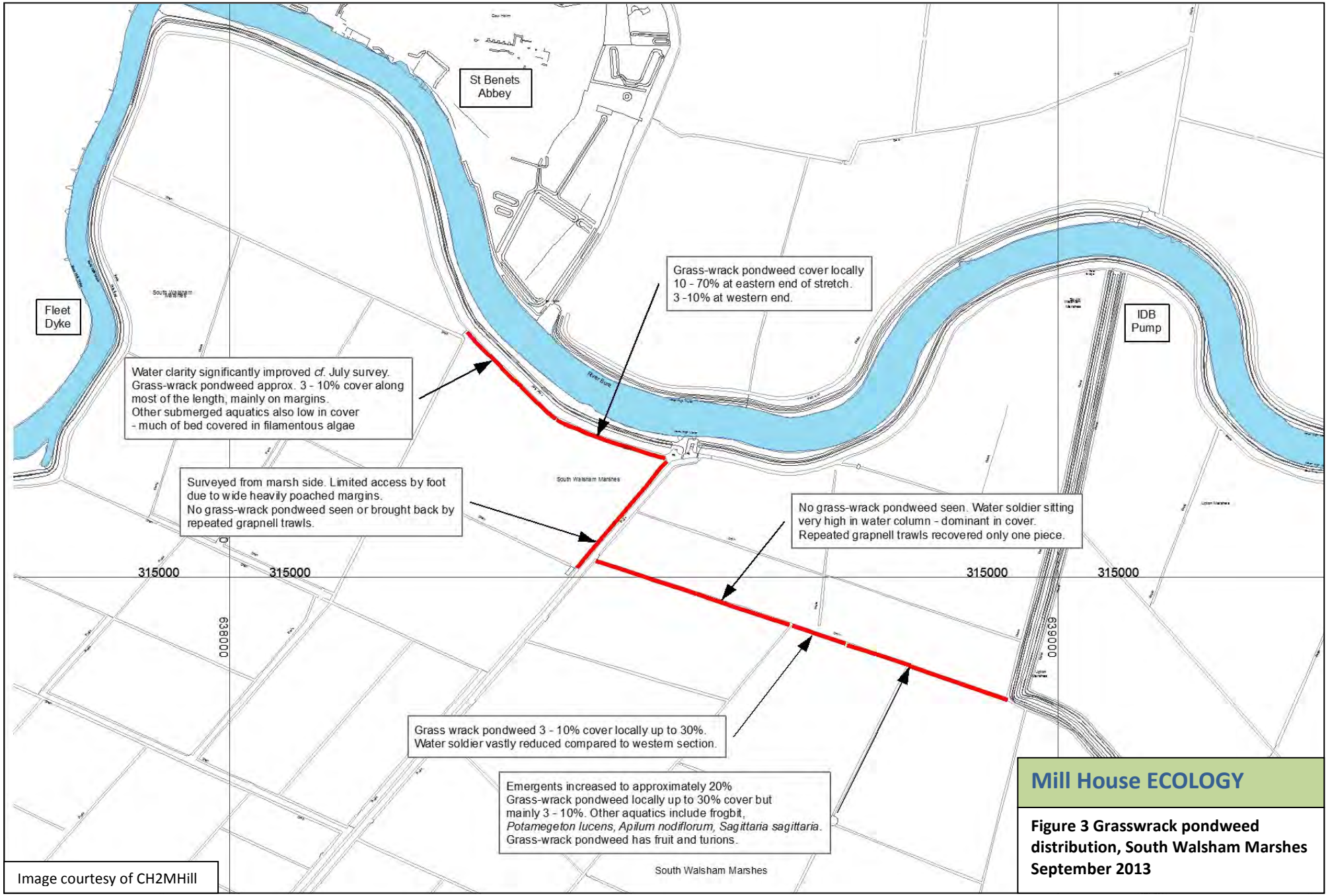

Image courtesy of CH2MHill

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Figure 3 Grasswrack pondweed distribution, South Walsham Marshes September 2013

Appendices

Appendix A1 Photos

Photo 1 Seeding the widened dyke with collected plant material

Photo 2 Collected turions

Photo 3 – Widened IDB dyke looking east from central track, July 2013

Photo 4 - Grass-wrack pondweed amongst water soldier in the western section of the widened IDB dyke July 2013

Photo 5 – Eastern stretch of IDB widened dyke, September 2013 (looking west)

Photo 6 – Grass wrack pondweed in the eastern section of the IDB widened dyke September 2013.

Photo 7 – Thick stands of emergent water soldier in western half of widened IDB marsh dyke, September 2013.