



Werrington Brook Improvements: Aubretia Avenue Reach Aquatic Plants Surveys

Version 3.2

Amelia Charles & Alex Pickwell

Lincolnshire & Northamptonshire Analysis & Reporting Team

23 November 2018

We are the Environment Agency. We protect and improve the environment.

We help people and wildlife adapt to climate change and reduce its impacts, including flooding, drought, sea level rise and coastal erosion.

We improve the quality of our water, land and air by tackling pollution. We work with businesses to help them comply with environmental regulations. A healthy and diverse environment enhances people's lives and contributes to economic growth.

We can't do this alone. We work as part of the Defra group (Department for Environment, Food & Rural Affairs), with the rest of government, local councils, businesses, civil society groups and local communities to create a better place for people and wildlife.

Executive summary

Aquatic plant (macrophyte) surveys were conducted before and after river habitat enhancement works at Werrington Brook, Peterborough. The post-enhancement survey found over twice as many aquatic species compared to before enhancement. All species found were relatively common.

More species of pondweed were found after enhancement, indicating improved water clarity and increased complexity of the river bed morphology. The Greater Reedmace and Water Plantain both appeared after enhancement, with few records of either species in the local area, according to the National Biodiversity Network (NBN).

Both aquatic plant diversity and habitat complexity has been increased as a result of the river enhancement efforts.

Contents

Executive summary	3
Introduction	5
Results	6
Other species	9
Appendix	10

Introduction

A river habitat enhancement project was conducted at Werrington Brook near Aubretia Avenue, Peterborough, with the aim of improving the quality of the water environment. The enhancement works were completed in June 2018. The techniques used included installation of berms, riffles, pools, bank scalloping and the creation of a small wetland area at a storm outfall.

Two surveys were conducted to assess the diversity of aquatic plant life at the Aubretia Reach of Werrington Brook; a pre-enhancement survey in October 2017 and a post-enhancement survey in August 2018. The watercourse was surveyed from the enhancement start point of Upstream Cuckoo's Hollow Footbridge (National Grid Reference (NGR): TF1757703726) to Upstream Larkspur Bridge, the enhancement end point, (NGR: TF1790903185) as shown in Figure 1.

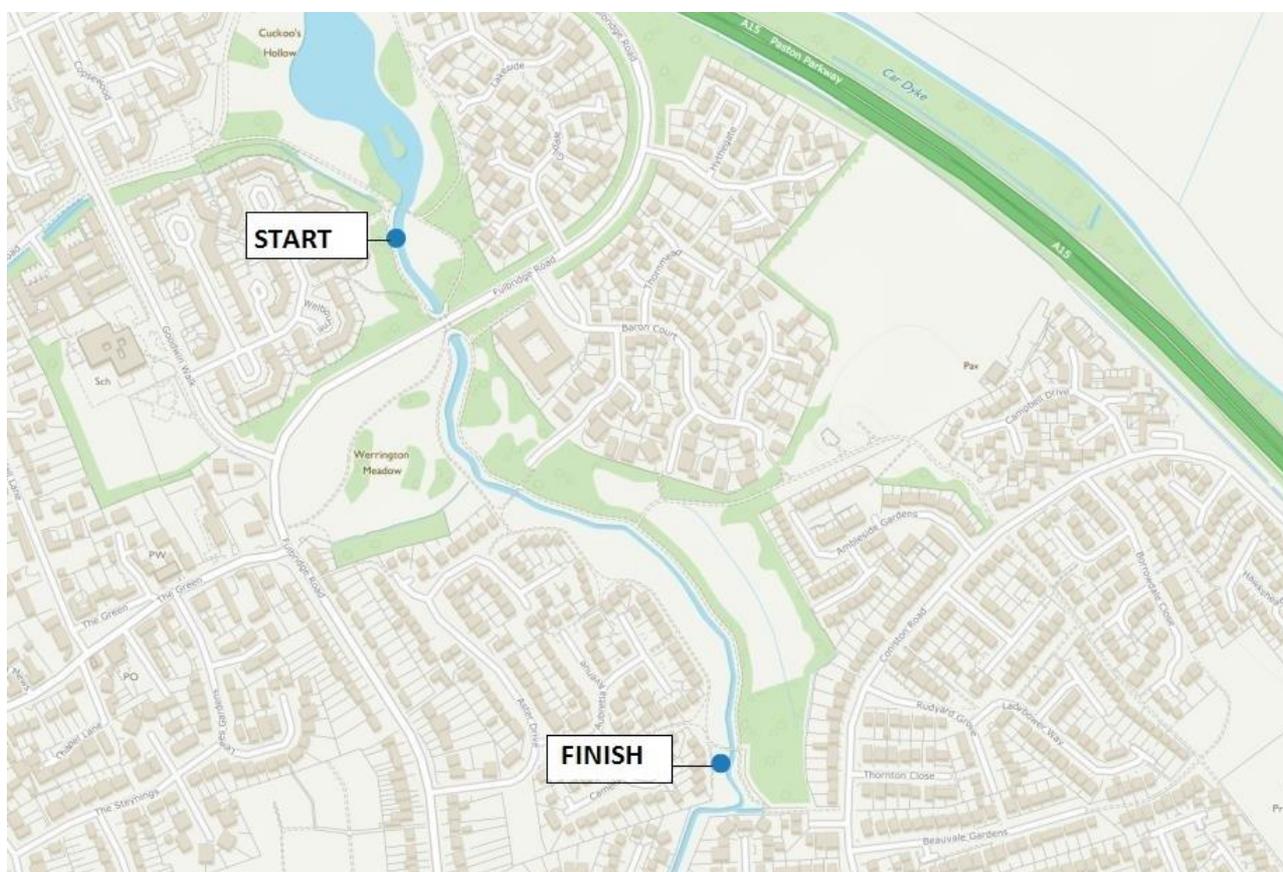


Figure 1: Aquatic plant survey start point of Upstream Cuckoo's Hollow Footbridge (National Grid Reference (NGR): TF1757703726) and end point of Upstream Larkspur Bridge (NGR: TF1790903185)

Results

The pre-enhancement survey identified 11 aquatic plants, all of which were common species. An additional 12 aquatic plant taxa were identified post-enhancement work (Figure 2; see Appendix for species list). This result demonstrates an increase in plant diversity resulting from the enhancement effort, which is important in increasing the conservation and amenity value of Werrington Brook.

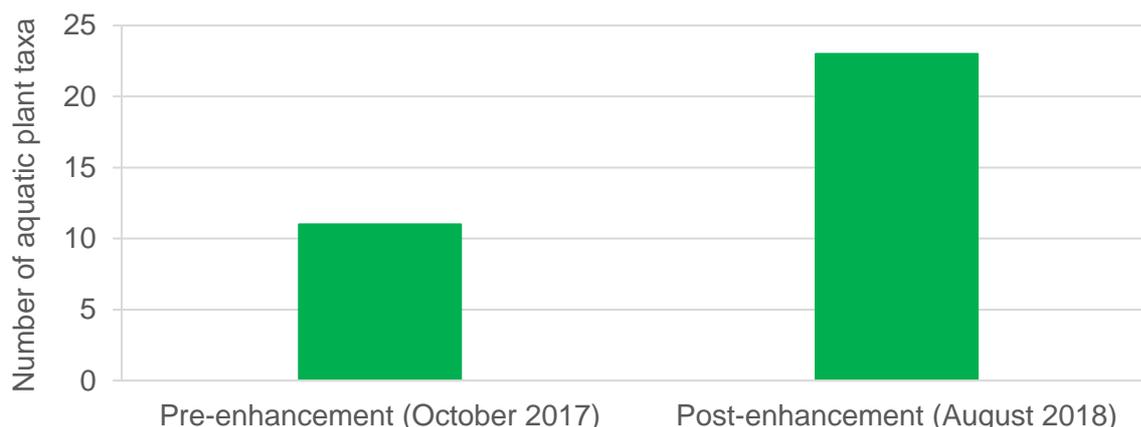


Figure 2: Number of aquatic plant taxa present pre- and post-enhancement of Werrington Brook, Aubretia Avenue Reach

As would be expected, a number of plant species recorded during the pre-enhancement survey and were also present during the post-enhancement survey. Common plants found in both surveys include Gypsywort (*Lycopus europaeus*), Nuttall's pondweed (*Elodea nuttallii*; Plate 1), water starwort (*Callitriche* sp.) and duckweed (*Lemna* sp.) (Plate 2).



Plate 1: Nuttall's pondweed (*Elodea nuttallii*). Photograph by A. Charles, 22/08/2018



Plate 2: Water starwort (*Callitriche* sp.) and duckweed (*Lemna* sp.) – the small, round, floating leaves. Photograph by A Charles, 22/08/2018

Nuttall's pondweed was the only pondweed found before the enhancement works. It is a very common species capable of growing in a wide variety of habitats usually subject to high nutrient loads.

Gypsywort (*Lycopus europaeus*), grows in most wetland types. The plant species was recorded at the Aubretia Reach of Werrington Brook during the pre-enhancement survey and was also present during the post-enhancement survey.

Photograph by A. Charles, 22/08/2018



The common reed species Reed Sweet-grass (*Glyceria maxima*; Plate 3), Reed Canary grass (*Phalaris arundinacea*) and Branched Bur-reed (*Sparganium erectum*) were all present both before and after the enhancement works, as was Watercress (*Rorippa nasturtium-aquaticum* agg.; Plate 4) and Fool's Watercress (*Apium nodiflorum*). Fool's Watercress and "true" Watercress both occupy a wide variety of habitats.



Plate 3: Reed sweet-grass (*Glyceria maxima*). Photograph by A. Charles, 22/08/2018



Plate 4: Watercress (*Rorippa nasturtium-aquaticum* agg.). Photograph by A. Charles, 22/08/2018.

The post-enhancement survey found more species of pondweed; Curled pondweed (*Potamogeton crispus*), Lesser pondweed (*Potamogeton pusillus*) and Horned pondweed (*Zannichellia palustris*) (Plate 5) were all recorded. These all generally grow in shallow standing or slow flowing clear waters. Given that these pondweed species were not found before the enhancement works, their presence post-enhancement demonstrate improved water clarity and increased complexity of the river bed morphology post-works.



Plate 5a



Plate 5b



Plate 5c

Plate 5: (a) Curled pondweed (*Potamogeton crispus*); (b) Fine leafed pondweed (*Potamogeton pusillus*) under the water; (c) Horned pondweed (*Zannichellia palustris*) in centre and Nuttall's pondweed (*Elodea nuttallii*) on left. Photographs by A. Charles, 22/08/2018

Other newly established plants found post-enhancement included Amphibious Bistort (*Persicaria amphibia*; Plate 6) and Celery-leaved Buttercup (*Ranunculus sceleratus*; Plate 7). Although common throughout the country, there are no other confirmed records for the celery-leaved buttercup in Peterborough according to the NBN Atlas (<https://species.nbnatlas.org/species/NBNSYS0000002721>, accessed 4/09/2018). Amphibious Bistort is able to grow in both heavy and medium nutrient loaded waterways.



Plate 6: Amphibious Bistort (*Persicaria amphibia*). Photograph by A. Charles, 22/08/2018



Plate 7: The celery-leaved buttercup (*Ranunculus sceleratus*). Photograph by A. Charles, 22/08/2018.

The broad leaved water plantain (*Alisma plantago-aquatica*; Plate 8) also appeared post-enhancement. This species is a recognised coloniser of recently cleared ditches, so its appearance is unsurprising. The Greater Reedmace (*Typha latifolia*; Plate 9) also appeared after the enhancement efforts. Despite both plant species being relatively common across the country there are few records of either species around the Peterborough area (NBN Atlas: <https://species.nbnatlas.org/species/NBNSYS0000002101> for *Alisma plantago-aquatica*, accessed 4/09/2018, <https://species.nbnatlas.org/species/NBNSYS0000002369> for *Typha latifolia*, accessed 05/09/2018).



Plate 8: Broad leaved water plantain (*Alisma plantago-aquatica*). Photograph by A. Charles, 22/08/2018



Plate 9: Greater Reedmace (*Typha latifolia*). Photograph by A. Charles, 22/08/2018.

Other species

Many large individuals of aquatic snails (species of Lymnaeidae and Planorbidae) were observed during the post-enhancement survey, as were several frogs along the bank (see box below). Large shoals of common rudd (*Scardinius erythrophthalmus*) were noted just downstream of Cuckoo's Hollow Footbridge which had not been noted pre-enhancement.

Numerous small common frogs (*Rana temporaria*), such as that in the photograph opposite (sheltering under Bittersweet *Solanum dulcamara*), were noted along the bankside, indicating that the enhancement work had not adversely impacted their presence at the location.

Photograph by A. Pickwell, 22/08/2018



Appendix

Table 1: Aquatic macrophyte taxa recorded during the pre-enhancement survey (October 2017) and post-enhancement survey (August 2018) of the Werrington Brook Aubretia Avenue Reach

Scientific name	Common name	October 2017	August 2018
<i>Alisma plantago-aquatica</i>	Broad-leafed water plantain	✓	✓
<i>Apium nodiflorum</i>	Fool's watercress		✓
<i>Callitriche</i> sp.	Water starwort	✓	✓
<i>Elodea nuttalli</i>	Nuttall's pondweed	✓	✓
<i>Epilobium hirsutum</i>	Hairy Willow-herb		✓
<i>Glyceria maxima</i>	Reed sweet-grass	✓	✓
<i>Iris pseudacoris</i>	Yellow iris	✓	✓
<i>Juncus effusus</i>	Soft rush		✓
<i>Lemna</i> sp.	Duckweed	✓	✓
<i>Lycopus europaeus</i>	Gypsywort	✓	✓
<i>Mentha aquatica</i>	Water mint		✓
<i>Persicaria amphibia</i>	Amphibious Bistort		✓
<i>Phalaris arundinacea</i>	Reed canary grass	✓	✓
<i>Potamogeton crispus</i>	Curled pondweed		✓
<i>Potamogeton pusillus</i>	Lesser pondweed		✓
<i>Ranunculus sceleratus</i>	Celery-leafed buttercup		✓
<i>Rorippa nasturtium-aquaticum</i> agg.	Watercress	✓	✓
<i>Rumex hydrolapathum</i>	Water dock		✓
<i>Solanum dulcamara</i>	Bittersweet		✓
<i>Sparganium erectum</i>	Branched Bur-reed	✓	✓
<i>Typha latifolia</i>	Common/Greater reedmace		✓
<i>Veronica beccabunga</i>	Brooklime	✓	✓
<i>Zannichellia palustris</i>	Horned pondweed		✓

**Would you like to find out more about us
or about your environment?**

Then call us on

03708 506 506 (Monday to Friday, 8am to 6pm)

email

enquiries@environment-agency.gov.uk

or visit our website

www.gov.uk/environment-agency

incident hotline 0800 807060 (24 hours)

floodline 0345 988 1188 (24 hours)

Find out about call charges (www.gov.uk/call-charges)



Environment first: Are you viewing this on screen? Please consider the environment and only print if absolutely necessary. If you are reading a paper copy, please don't forget to reuse and recycle if possible.