River Ock Catchment Partnership

Newsletter – Summer 2020

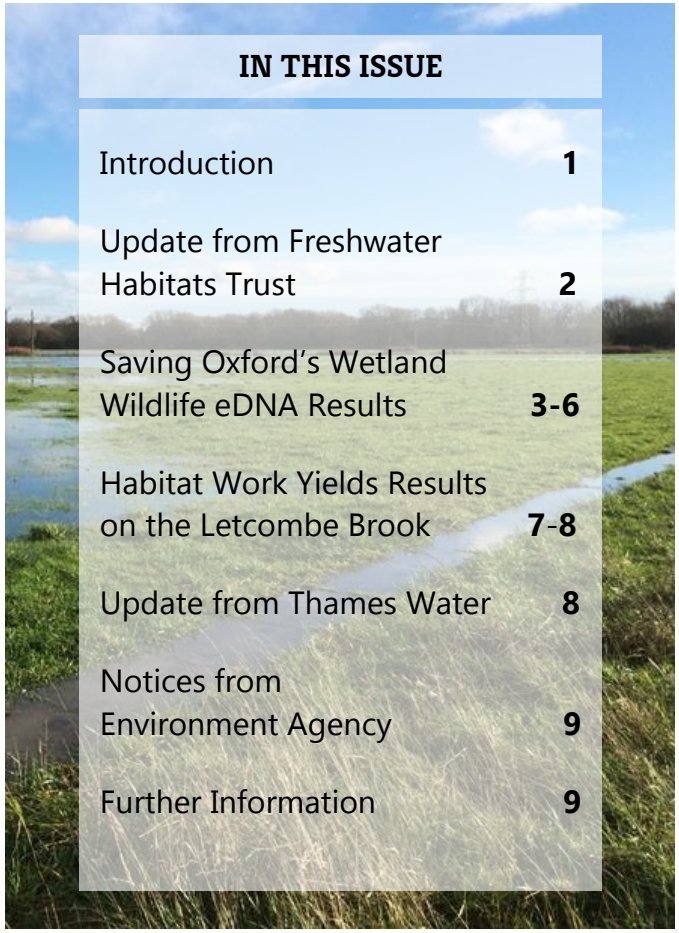
Introduction

Welcome to the summer 2020 River Ock Catchment Partnership newsletter, which brings you the latest water-related updates from around the Ock catchment.

Since the last newsletter, life has changed drastically for many of us due to the Covid-19 pandemic. Whilst we may have to adjust to a 'new normal' when restrictions are finally lifted, this may be an opportunity to benefit the environment and address climate change. Over 60 organisations and individuals recently called on the UK Government to adopt a green approach to the Covid-19 recovery in an open letter, which you can read here. Additionally, organisations may increase regular home working following the pandemic, which will reduce the number of cars on the road, helping to combat air pollution. The present crisis also demonstrates the power of working together to achieve goals - an ethos that is at the heart of catchment partnership working.

If you would like to contribute to the next newsletter, please get in touch (details on page 9). I hope you all remain safe and well during these unprecedented times, and send my very best wishes.

Ellie Mayhew, Regional Project Officer



IN THIS ISSUE

Update from Freshwater Habitats Trust

Ock Catchment Partnership Hosting

Freshwater Habitats Trust has been continuing to host quarterly Ock Catchment Partnership meetings. The most recent meeting, at the start of April, was held via Microsoft Teams due to Covid-19 restrictions. This worked well, and we plan to use it again for the next meeting on Tuesday 7th July, as social distancing rules will very likely still apply.

In the April meeting, we compiled a catchment partnership response to Environment Agency's Challenges and Choices consultation in a session led by Kay Lidgard and Helen Cardy. We answered 4 of the 10 questions which we felt were most relevant to the Ock catchment. These were: climate and biodiversity crisis; physical modifications; pollution from agriculture and rural areas, and pollution from water industry wastewater. It was insightful to bring together ideas of people from different organisations. The Ock Catchment Partnership's response will be made available on the webpage when it has been finalised.

Ock Arable Project

We are really pleased to report that the Ock Arable Project has been awarded WEIF Revenue funding for another year (2020/21). Only a small list of critical projects were able to be funded due to the impacts of Covid-19 on Revenue budgets, so this is fantastic news.

The Ock Arable Project is delivered by Freshwater Habitats Trust and Environment Agency, who are working in partnership to undertake farm visits across the Ock catchment. The aims of these visits is to:

- Provide tailored advice on the adoption of measures to ameliorate diffuse pollution, and identify sources of point-source pollution
- Assess the suitability of the land for installation of Natural Flood Management (NFM) measures
- Locate suitable areas for freshwater habitat creation and suggest ways to improve the quality of existing freshwater habitats.

The next main step with the project is to continue developing practical projects with farmers and landowners we have already engaged with, to improve their land for freshwater biodiversity and help reduce flooding downstream (though this is dependent on the Natural Flood Management modelling results). We will also continue to engage with new farmers in the catchment through further initial site visits. So far, we have visited farms covering over 30% of the Ock catchment; our aim is to extend this to 40% of the total catchment area.

Freshwater Habitats Trust - Saving Oxford's Wetland Wildlife eDNA Results

Saving Oxford's Wetland Wildlife is a three-year project which aims to help maximise the environmental and community benefit of the Oxford Flood Alleviation Scheme, and engage Oxford's residents with their freshwater heritage through volunteering opportunities, citizen science, public talks and guided walks. In addition to this, the project involves practical management work to improve freshwater habitats around Oxford, and surveys which form part of a monitoring programme that is helping to add to baseline data from the flood scheme area (which will be used to underpin the long-term monitoring of the flood scheme).

As part of the project, Freshwater Habitats Trust has undertaken multi-species environmental DNA surveys to assess the distribution of fish, amphibians and aquatic mammals around the proposed Oxford Flood Alleviation Scheme area. Environmental DNA, or 'eDNA', is genetic material released by an organism into its surrounding environment. Sources of eDNA include faeces, shed skin and hair, mucous and gametes (eggs and sperm). eDNA is thought to persist for up to one month in the environment, depending on environmental conditions. Advances in DNA technology mean it is now possible to detect freshwater animals by collecting and analysing a simple water sample.

A total of 28 survey sites were selected by Freshwater Habitats Trust (see Figure 2 below). The sites were primarily located in and around the Oxford Flood Alleviation Scheme area, and encompassed five waterbody types: ponds, streams, rivers, lakes and ditches. Sampling was undertaken using NatureMetrics multi-species eDNA kits between April and July 2019 by our team of dedicated volunteers. Samples were then sent off to NatureMetrics for 'metabarcoding' analysis.

Results

A total of 74 vertebrate species were detected across the 28 sample sites; this comprised of 23 fish, 4 amphibian, 14 mammal and 33 bird species. The number of vertebrate species recorded at a single site ranged from 1 to 32, and the median number of species recorded per site was 14. The three sites with the highest recorded number of vertebrate species were: Bulstake Stream 3 (site 20) with 32 species; Hinksey Heights Stream (site 11) with 30 species, and Bulstake Stream 2 (site 17) with 26 species. Although worldwide research suggests that fish eDNA results are quite well aligned with traditional fish data – and we know that single-species eDNA tests for Great Crested Newt are very reliable – at present, much less is known about how much weight to put on mammal and bird eDNA data.

Volunteers collecting an eDNA sample from a waterbody.

An eDNA filter.

Thames Water GRUNDON toe Trust for Oxfordshire's Environment

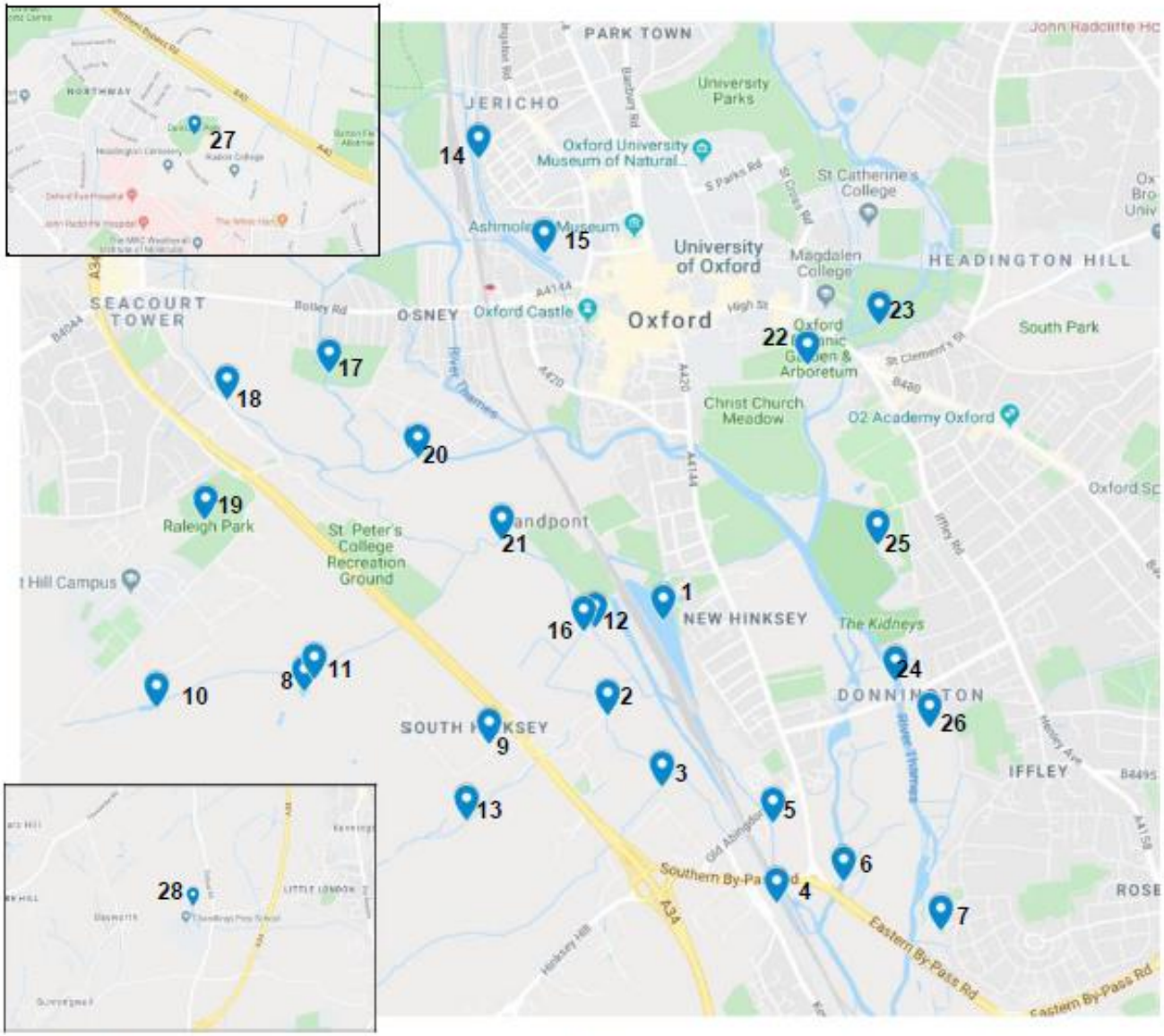


Figure 2. Locations of the 28 sites sampled using eDNA kits for Saving Oxford's Wetland Wildlife in 2019.

Table 1. The numbers and names assigned to each eDNA sample site.

No.	Site Name
1	Hinksey Lake
2	South Hinksey Drain 1
3	South Hinksey Drain 2
4	Kennington Pit
5	Hinksey Stream at Redbridge
6	Weirs Mill Stream
7	Rivermead Pond
8	Hinksey Heights Golf Club Pond 1
9	Hinksey Heights Golf Club Pond 2
10	Hinksey Heights Golf Club Pond 3
11	Hinksey Heights Stream
12	South Hinksey Drain 3
13	Chilswell Stream
14	Oxford Canal
15	Worcester College Pond
16	Bulstake Stream 1
17	Bulstake Stream 2
18	Seacourt Stream
19	Raleigh Park Pond
20	Bulstake Stream 3
21	Hinksey Stream
22	Oxford Botanic Garden Pond
23	River Cherwell
24	River Thames (Donnington Bridge)
25	Shire Lake Ditch
26	Boundary Brook
27	Dunstan Park Pond
28	Chandlings School Pond

Saving Oxford's Wetland Wildlife eDNA Results (continued)

Amphibians

A total of 4 amphibian species were recorded across the 28 sample sites: Common Frog, Common Toad, Smooth Newt and Great Crested Newt. The most commonly detected amphibian species was Smooth Newt, which was recorded at 7 of the sites, followed by Common Frog (5 sites) and Common Toad (4 sites). Smooth Newt is Britain's commonest newt species, so we would expect it to be the most frequently recorded by eDNA. Palmate Newt was not recorded at any of the sites, which is in line with what one might expect, given that this species is the rarest native amphibian in the Oxford area. None of the sites surveyed are known to support Palmate Newt. Great Crested Newt was detected at 2 sites, one of which was a stream. It would be very unusual for Great Crested Newt to be present in a stream, so this may be a case of eDNA being washed in from surrounding land or other ponds.

Fish

A total of 23 fish species were recorded across the 28 sample sites. eDNA surveys allow landscape-level surveying of fish – something that has been time-consuming and costly to achieve up until now. Previously, most fish records had come mainly from rivers and lakes, either reported by anglers or the results of electrofishing surveys. eDNA surveys allow a wider range of freshwater habitats to be quickly sampled across an entire catchment or landscape, from ponds and ditches to rivers and lakes. The eDNA kits recorded a higher number of fish species than the electrofishing surveys undertaken by the Environment Agency in the flood scheme area. This is a commonly observed pattern when comparing data from the two survey methods. The most commonly recorded fish were Roach, Pike, Perch and Orfe/Dace (these two species cannot be separated based on the DNA markers used in the analyses). The fish species recorded least frequently were Nine-spined Stickleback, Tench and lamprey species.

An invasive non-native species called Sunbleak was detected at nine of the sites. Freshwater Habitats Trust has been investigating these records, as it is not clear whether the species is really present in the study area. It hasn't been recorded previously, so we are treating this detection with caution. At present we will not treat these records as confirmed until some 'real' fish are captured. Atlantic Salmon was also detected at one site (Hinksey Stream at Redbridge), and this record is being treated with caution too. A salmon was seen in the Thames in West London, near Chertsey, in 2019, but local fish experts think it is unlikely a salmon was present as far up as Oxford. This detection is currently unverifiable, as there are no traditional fish survey records from the same time to compare the eDNA results against. This raises the possibility that the record may have been a result of contamination or derived from a non-wild source (e.g. eDNA from salmon eaten as a foodstuff reaching the environment through sewage effluents). More matching with data collected using traditional methods, such as electrofishing, would help to establish the way we should treat records such as these.

Saving Oxford's Wetland Wildlife eDNA Results (continued)

Mammals

Two aquatic mammal species were recorded, Water Vole and Water Shrew. Water Vole was recorded in a place where they were not previously thought to be present – Hinksey Stream (site 21). Freshwater Habitats Trust is currently investigating this record. It is currently unclear whether Water Vole DNA could be transported from higher up the Thames to this site. The nearest records upstream of Oxford in waterways directly connected to this site are a long way off (perhaps as far as Chimney Meadow). The Oxford Canal, where there is a known population, is not connected directly to the Hinksey Stream. Water Shrew was recorded at 2 sites – Hinksey Heights Stream and Chilswell Valley. Water Shrew are typically elusive and difficult to survey, and eDNA could offer a simpler way of detecting such a species than traditional survey methods.

Birds

A total of 7 water birds were recorded to species level, with a further 3 identified to family or genus level. Moorhen was the most commonly detected water bird, and was recorded at 18 sites. Mallard and Common Shelduck cannot be differentiated based on genetic markers, as they are so closely related. However, Mallard and/or Shelduck was also widely recorded, present at 18 of the 28 sample sites. These records presumably refer to Mallard as Shelduck are infrequent around Oxford. Grey Heron, Common Kingfisher, Mandarin Duck, Coot and Great Cormorant were the least commonly recorded water birds, detected at just one site.

Other Species

In theory, vertebrate DNA can wash into water from anywhere in the landscape. Because of this, a range of non-aquatic mammals are also detected by eDNA surveys, including Roe Deer, Grey Squirrel and Red Fox. Similarly, lots of non-aquatic birds were detected (21 species in total), such as Sparrowhawk, Long-tailed Tit and undetermined species of pigeon (*Columba* sp.). Their DNA could have arrived in the water in several different ways: washing in from the surrounding area after rain; when the animal visited the waterbody to drink, or (perhaps more likely) bathe, or faeces dropping into the water from passing birds flying overhead.

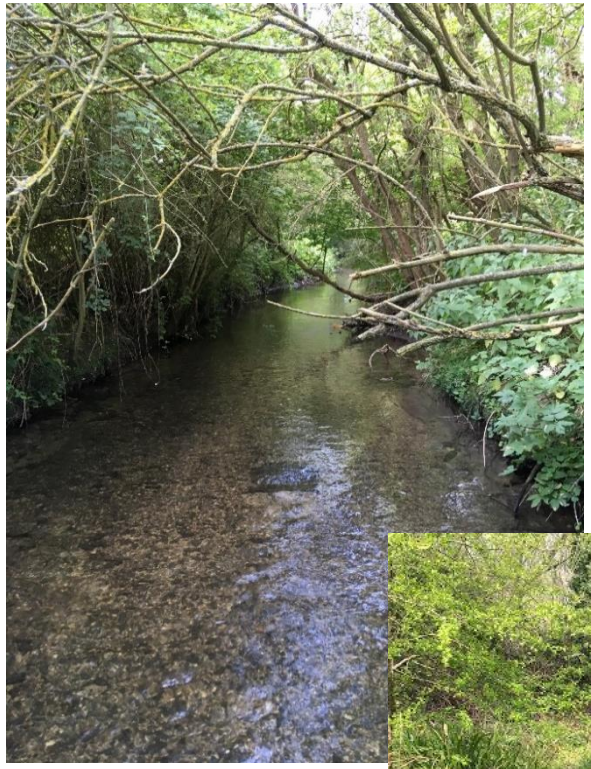
At present, there is no information with which to assess the comparative likelihood of any of these routes of entry of eDNA into the water. Whilst further clarity is required to fully understand what these records mean (for example, how far DNA can travel and the extent of the area it may have washed in from), multi-species eDNA surveys have the potential to provide a useful snapshot of entire ecosystems.

Habitat Work Yields Results on the Letcombe Brook

Letcombe Brook Project and its fantastic volunteer team have been working hard over the past two years to improve habitat along the Letcombe Brook. Much of the brook had become very over-shaded by large unmanaged crack willow and bramble scrub, which had led to sections of bare bank prone to erosion and almost devoid of riparian habitat. The brook's channel still had a good gravel bed in most places, but very little aquatic vegetation to provide food and cover for the many creatures that call the brook home.

The main tasks have been to pollard larger willows and push back the bramble from the riverbanks so that light could penetrate and encourage the growth of more diverse and specialised riparian vegetation. We have been amazed and encouraged at just how quickly the brook has responded to this work. Water starwort (*Callitriche* sp.), Water Mint (*Mentha aquatica*), Brooklime (*Veronica beccabunga*) and both Watercress (*Rorippa nasturtium-aquaticum*) and Fool's water-cress (*Apium nodiflorum*) have soon colonised many sections. Gypsywort (*Lycopus europaeus*), Meadowsweet (*Filipendula ulmaria*) and even the fragile Cuckooflower (*Cardamine pratensis*) have also appeared in some areas. As the vegetation has recovered, silt deposits have stabilised, resulting in greater variation in flow and channel width, all increasing habitat diversity. The plants provide important shelter and food for many invertebrates, and small fish are able to use them as refuge from larger predators.

One other resident of the brook that seems to have benefited is the Water Vole (*Arvicola amphibius*). Letcombe Brook supports Water Vole along much of its length, but Letcombe Brook Project were concerned the population might have started to decline due to habitat loss and predation.



A shaded section of the Letcombe Brook with a bare riverbed (above) and a recovering section of the brook (right)

Letcombe Brook Update (continued)

On a recent early morning visit to the brook in Grove, seven Water Vole were spotted feeding amongst the bankside vegetation – hopefully a sign that they may be staging a recovery. As Water Voles need to consume something like 80% of their body weight in bankside vegetation each day, abundant bankside vegetation is critical to them prospering. They do seem to have managed to hang on under patches of bramble and in sub optimal habitat but LBP felt it important to try and protect this local population of what is a fast declining species in the UK.

One of our other projects focusses on controlling invasive species – on the Letcombe this means hand pulling the colourful but problematic Himalayan balsam (*Impatiens glandulifera*) and trapping American mink (*Neovison vison*). Both these measures contribute further to helping water vole recovery by improving habitat and removing their primary predator. Although the Project Officer is continuing with this work, we hope to be able to increase output greatly once social distancing restrictions are lifted!

We are also pleased to report that Thames Water have now stopped abstracting water from the aquifer that feeds Letcombe Brook. We thank Thames Water and the Environment Agency for their part in the costly project that has made this possible and hope that water companies in the UK can continue to work towards reducing damaging abstraction on chalk streams.

Update from Thames Water

Metaldehyde Project

In autumn 2019, Thames Water continued with its hotspot product substitution project in the Ock, working with farmers to reduce the amount of metaldehyde from reaching local rivers. Metaldehyde is the active ingredient in many slug pellets, but rain washes it off surrounding fields and farmyards, which can challenge our complex water treatment processes to produce clean drinking water.

In autumn 2019, we engaged with 24 farmers, providing a subsidy to switch to an alternative slug pellet (ferric phosphate), which can help to improve water quality. We also continued to monitor water quality data at the downstream end of the catchment, and pleasingly metaldehyde concentrations remained consistently low from September to December. Thank you to all the landowners who have taken part.

We expect to continue this project in autumn 2020 and will be sharing information on how to participate shortly. If you have any questions regarding our project, please contact: catchment.management@thameswater.co.uk.

Notices from Environment Agency

Challenges and Choices Consultation

The Challenges & Choices consultation response deadline has been extended by 5 months to 24 September 2020.

Covid-19 Update

Below is a summary detailing what Environment Agency are doing during the Covid-19 pandemic with regards to regulation and responding to incidents.

We will still focus on the three strategic priorities identified:

- Protecting the health, safety and wellbeing of all our people
- Protecting lives
- Preventing serious harm to the environment

We have scaled back all field, laboratory and office based activity that doesn't meet these criteria. We will continue to run the Incident Communication Service for incident handling so we are able to fulfil our role as a Category 1 responder. Laboratories will continue to analyse critical samples that allow us to maintain our Category 1 response or prevent serious environmental harm, but we will stop routine analysis.

We continue to carry out regulatory visits to sites that could cause serious environmental harm where required (for example COMAH sites and nuclear). However, we are reducing regulatory visits to other sites (such as waste water treatment works) and reviewing how best to regulate them in accordance with the government guidance on social distancing.

Please be assured that we are still responding to incidents, so please continue to report any environmental incidents through the usual routes – see website here.

Further Information

You can read more about the River Ock Catchment Project on our website here, and find out more about the Catchment Based Approach here.

If you'd like to contribute to future newsletters, please get in touch by emailing Ellie Mayhew (emayhew@freshwaterhabitats.org.uk) – the deadline for submitting content for the next River Ock Catchment Partnership Newsletter is Friday 30th October 2020.

Keep up to date by following Freshwater Habitats Trust on social media: