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<b>Subject</b>	<b>Whorled Water- Milfoil Mitigation Strategy</b>	<b>Project Name</b>	Oxford FAS
<b>Attention</b>	Environment Agency	<b>Project No.</b>	684232CH
<b>From</b>	Debbie MacKenzie		
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<b>Copies to</b>			

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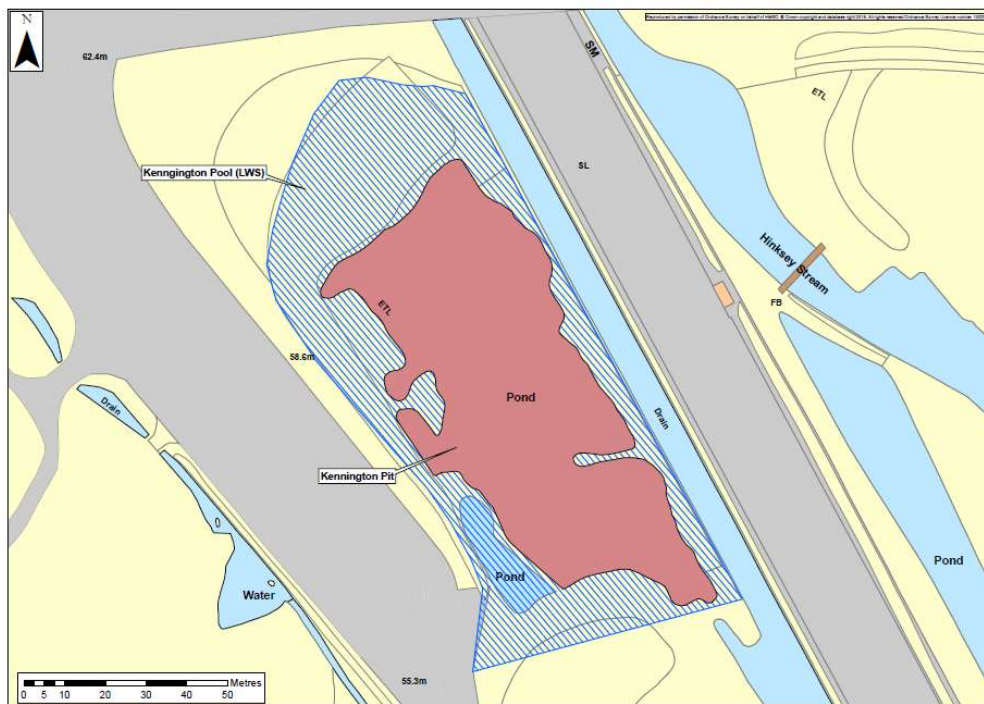
## 1. Introduction

### 1.1 Background

Jacobs has been commissioned by the Environment Agency to prepare a mitigation strategy for a population of whorled water-milfoil *Myriophyllum verticillatum*, which is likely to be directly impacted by works proposed as part of the Oxford FAS.

The population of whorled water-milfoil is located in a pond (“Kennington Pit”) at Kennington Pool Local Wildlife Site (LWS), a “priority pond” (for its plant community), originally dug as a borrow pit for the construction of the railway. It is located between Kennington Road to the west, the railway to the east and the A423 to the north (Figure 1).

Figure 1: Kennington Pit



The aims of this mitigation strategy are to plan for the conservation of whorled water-milfoil before, during and after the scheme, in its current location and within a new water body.

## 2. Whorled Water-milfoil Ecology

Whorled water-milfoil is a scarce species in the UK (<https://www.brc.ac.uk/plantatlas/plant/myriophyllum-verticillatum>, accessed January 2021). On the International Union for Conservation of Nature (IUCN) Red List of threatened Species, it is classed as Least Concern (<http://www.iucnredlist.org/details/164335/0>, accessed January 2021) as it is widespread with stable populations and does not face any major threats, although there is evidence that it is declining in northwest Europe. It is not clear whether this is because of loss and degradation of fenland habitats, or whether there is a wider problem.

Within Oxfordshire it is known to be present along the River Ray at Islip and at Kennington Pit, this site (AECOM, 2020 and Flood, 2017).

Whorled water-milfoil is “a robust, perennial plant of clear or slightly turbid, still or slowly flowing calcareous water in lakes, streams, canals and ditches. It occurs over both peaty and inorganic substrates. It flowers and sets seed, and also perennates by specialised turions which are produced in the leaf axils.” <https://www.brc.ac.uk/plantatlas/plant/myriophyllum-verticillatum>, accessed January 2021.

## 3. Potential Impacts

Construction of the Scheme will result in two impacts to whorled water-milfoil; namely a reduction in the size of Kennington Pit and changes in water quality.

### 3.1 A reduction in the size of Kennington Pit

The Scheme will reduce the size of Kennington Pit by 62% (from approximately 4563 m<sup>2</sup> to 1752 m<sup>2</sup>), as an earth bank is to be constructed within its footprint to separate the new channel, which will come under the A423 from the remaining Kennington Pit. This will result in a loss of available aquatic habitat for this species.

### 3.2 Change in water quality and hydrology

Construction work may change the water quality, particularly turbidity, and flow within Kennington Pit, which might result in a change in conditions, unsuitable for the species. There is also the potential for pollution, sediment and silt from construction.

## 4. Mitigation strategy Approach

### 4.1 Overview

In order to safeguard the future of this species two methodologies are proposed:

- Mitigation within Kennington Pit to maintain the existing population of whorled water-milfoil *in situ*.
- Translocation of whorled water-milfoil to a temporary location where it can be ‘grown on’, and then on completion of the scheme, plants can be replaced in the event that *in situ* conservation does not work.

### 4.2 *In situ* Mitigation

We will attempt to keep whorled water-milfoil in place in Kennington Pit during the construction of the scheme. Plants will be identified and their location mapped. Prior to any construction work a coffer dam will be put across the Pit to protect the part that is to remain undisturbed. This coffer dam will prevent changes in water movement, turbidity levels and silt accumulation. The water quality and water levels should not be impacted.

Where possible, site clearance will take place which will not negatively impact this species. Tree and scrub clearance will likely benefit whorled water-milfoil as there is likely to be less shading on Kennington Pit.

### 4.3 Translocation

A number of plants will be temporarily translocated to a suitable location to be 'grown on', as a precautionary approach to safeguard the population.

Translocation requirements identified are:

- should take place in spring to give time for plants to establish, when turions expand and grow from the stem;
- translocated plants should come from the part of the Pit which will be lost, if possible;
- the temporary translocation location(s) should ideally have a light sandy bottom and medium loamy soils; and
- where the water depth should be around 15 – 60 cm and to be not overly shaded.

The translocated whorled water-milfoil plants can be relocated back to Kennington Pit on completion of the works and, when a visual assessment of the water environment at Kennington Pit is considered to be the same or better than what it was prior to construction, with regard to turbidity and siltation.

### 4.4 Operation

We will set up a monitoring programme for the first five years after the works are complete, to assess whether mitigation plans for particularly sensitive plant species and communities have been successful. If we find that whorled water-milfoil is declining, we will agree remedial actions with The Freshwater Habitats Trust and implement them.

## 5. References

AECOM (2020) Kennington Pit PSYM Survey. Environment Agency

Tim Flood (2017) Kennington Pit Biological Summary Report

<https://www.brc.ac.uk/plantatlas/plant/myriophyllum-verticillatum> [Accessed January 2021]

<http://www.iucnredlist.org/details/164335/0> [Accessed January 2021]