NASH POND – REDEVELOPMENT

A brief history of the pond

It is difficult to say how long Nash Pond itself has existed. The surrounding area has been occupied for many centuries and, as the pond appears to be natural rather than manmade, it is likely settlers were attracted to the area by the presence of a pond.

In 2015 an exploratory trench was dug within a couple of metres of the pond. Beneath the clay, an alluvial deposit was found. Tiny pebbles were clearly evident at the top of this trench, graduating down to fist sized pebbles two metres down, arranged like an alluvial deposit. This suggests that in ancient times, possibly as far back as the last ice age, a large amount of rubble within a torrent of fast-moving water travelled downhill and deposited itself in the area of the pond. This indicates that water has both travelled through and stopped here going back to times before human occupation; the pond may well have been in use during Norman times and possibly even pre-Norman times, such as by the Anglo-Saxons, Romans and even Celtic Britons. The stream is, after all, a tributary of the Great Ouse, with the name Ouse being derived from an old Celtic word for water.

The original road from Buckingham to Newport Pagnell, following the track known as the North Bucks Way from Buckingham, past Wier Cottage, up Wood End and continued from the top of Wood End on to Whaddon has been shown on maps for centuries. It was a far more important and older road than the current Winslow Road.

To the east of Wood End the path continues as a sunken road, well below current ground level. This ‘sinking’ of the road would have been formed by the passage of people, vehicles and animals. Sunken roads are generally considered to be several hundred years old, though it is difficult to date them with any precision. This again suggests a long history of human occupation, commerce and transport with the pond at the point where this east west track intersects the stream from the south as it continues north to the Ouse.

Sunken roads regularly acted as strategic routeways in times of battle, and it is very likely that this road will have seen action in the civil war, which was actively fought in this area. Newport Pagnell was a stronghold of Parliament throughout the war, with Oliver Cromwell’s own son stationed there as a Cavalry officer. The King’s headquarters was in Oxford, with Buckingham acting as his frontline. Consequently, the area between Whaddon and Buckingham is described as “disputed territory” in maps of the conflict.

Until the nineteenth century, the pond was part of Nash Common, which was to the south of the North Bucks Way.

In the first half of the twentieth century, Joan Selby-Lowndes, daughter of the Rev E A Selby-Lowndes, vicar of St Mary's church, Whaddon, Buckinghamshire wrote many books for children; some of them set in the village in which she grew up. In one of these she mentions a ducking stool in Nash Pond. She might be referring to this pond, or to a deeper pond to the west of it, and the story cannot be verified.

People and documents consulted

As a starting point for this brief, the survey commissioned by NPC in 2020, the *Village of Nash's Pond Environmental Analysis*, has been used.

We have also contacted Kate Sheard and Alex Cruikshank of the The Berks, Bucks and Oxon Wildlife Trust, Pascale Nicolet of Freshwater Habitats, Chris Powles of the Kirtlington Conservation Group, Kirtlington Parish council, and the Milton Keynes Parks Trust.

Thanks, too, to Robert Meardon and John King from the village who have provided us with very useful information and suggestions.

Current situation of the pond
Much of the information in this section is taken from the environmental analysis of the pond commissioned by the NPC in 2020.

Estimated surface area: 850 M² Estimated volume: 500.000 LT

Estimated flow rate: 25lt /sec Average depth**:** 55cm

The pond base consists of sand, gravel and cobbles. The pond basin, based on local geology, is clay.

Nash pond is a natural pond with no obvious sign of modification, except for the bridge. The pond has been party dredged on more than one occasion, and approximately 70% of the total vegetation has been removed by hand in the last couple of years. No other structural works have been undertaken. The southwest bank is covered with overhanging vegetation, some of it dead and in need of removal.

There were in 2020 a number of juvenile sticklebacks in the pond. The water conditions were, according to the survey, not suitable to sustain larger fish.

A number of invasive species of aquatic weed (in particular Elodia (*E. nuttallii*) and Acorus, both of which are considered 'high impact' in the UK Plan Risk Assessment) have established themselves in the pond. The Elodia have been removed from the centre of the pond but will inevitably regrow due to the physiology of the plant. The Acorus is still rampant.

There are significant quantities of suspended solids coming into the pond via the stream on the south east side. This has created a deposit of silt. The mid to west part of the pond has a deposit depth of 30-40cm, occasionally over 50cm. A land 'peninsula' of approximately 10m² has formed on the south side. This peninsula has a further detrimental effect on the pond as it blocks the circulation of the water on the west side and slows the flow, which then encourages the depositing of more silt. This deposit can and does occasionally get disturbed with negative effects on the water quality and clarity.

There is also a second inlet into the pond, again depositing significant quantities of suspended solids. This is a pipe on the south west corner, which apparently deposits water from the 421 roundabout, from part of College Wood and from Nash Park into the pond when it rains.

The problems:

Silting
It appears that the base of the pond consists of sand, gravel and cobbles. In March 2020 an environmental impact study was undertaken by Aquarium High Maintenance on behalf of Nash Parish Council. It found that, over many decades, a significant quantity of suspended solids has been entering the pond from the stream on the south east side as well as from the pipe on the south west side. The silt on the south west side has formed into a land ''peninsula'' of approximately 10m² next to the stream, bocking the circulation of the water. This has created a deposit of silt that mainly affects the areas of the pond that are not under direct current. The average depth of the pond is 55cm and the maximum depth 70cm.

This silting of the pond causes a number of issues:

- The pond can and does dry out in summer – this looks unsightly and is detrimental to wildlife, fish and insects.
- The quality of the water is reduced by the toxins in the silt. The presence of NO2 indicates evidence of anaerobic zones on the ponds base, under the silt deposit. The 2020 survey found no substantial toxicity in the pond water itself. However, when the sediment is disturbed, toxic substances locked inside the deposit are released.

- The outlet pipes regularly become blocked, increasing the likelihood of flooding over Wood End and occasionally over Winslow Road.
- The invasive species of plants in the pond (which can only grow in water less than 70cm deep) are able to invade the entire pond.

Overhanging trees and shrubs
The southwest bank is covered with overhanging vegetation and there are some small trees on the south land formation and a large ash tree on the east side. These are mostly beneficial, but it would be useful to trim the excess vegetation to the south of the pond and to remove the dead vegetation there.

Aquatic vegetation
The removal of the invasive plant species is recommended as this will make the pond look more attractive and will have a positive impact on the ecology of the pond, encouraging greater diversity, especially if native non-invasive species are planted to replace them.

Water chemistry
The chemistry of the water currently in the pond is good, although the silt deposits create anaerobic zones which release toxicity when disturbed. The quality of the water is such that it could house a very diverse ecosystem for fish, amphibians and insects were it not for the silt and the presence of large amounts of aquatic vegetation which increase the acidity of the water quite dramatically.

Flooding
In winter, when more water flows suddenly into the pond, the water level can rise quickly. This causes flooding over Wood End and occasionally over Winslow Road.

Land peninsula
The silt has formed into a land peninsula to the west of the stream. This blocks the circulation of the water on the west side and therefore has a detrimental effect on the silt deposit.

Aims of the project
In the light of this survey, the main aims of improving the pond seem to be:

- To remove sludge from the pond
- To minimise the re-sludging of the pond
- To remove invasive species in the pond
- To ensure that the pond keeps water in all year round
- To stop the pipes under both roads from becoming blocked
- To stop the pond flooding over the road
- To make the pond more wildlife friendly
- To make the pond look more attractive
- To ensure that future maintenance is minimal.

Suggestions for remedy
Suggestions for remedy are as follows:

Removal of silt
One of the most important requirements for the improvement for the pond will be the removal of silt since too much sediment creates a dead pond, leads to drying out of the water and to the pond becoming covered in aquatic weed.

There are three possible methods of desilting:

1 Removal of silt without draining the pond
A number of attempts have already been made to remove the silt in the pond with a digger. These have removed a certain amount of silt but have been costly and only partly successful. It is difficult to remove enough silt from the right areas when you cannot see what you are removing and how far you are digging. In addition, the silt when wet is much heavier and bulkier to move and more expensive to take away.

This method moves the water and debris around, including plant roots, and therefore encourages invasive plants to regrow over an even wider area of the pond, rather than removing them.

2 Draining the pond to remove the silt
This method is generally considered to be more successful, since it is possible to see what is being removed and remove the silt with less likelihood of damaging the impermeable layer. Sludge and debris are therefore easier, quicker and often cheaper to remove in spite of the costs of pumping out the water. This method has been successfully used in a number of similar ponds, including the pond in Kirtlington (a village in Oxfordshire) which had become silted up and overgrown with weeds. We have spoken by email to Chairman of the Pond's Committee at Kirtlington, who said "It went like clockwork, taking 1½ days less than planned and coming in a bit under budget."

To give a vague idea of costs, they spent £11,062 on the draining and digging out of their pond, which is similar in size to that in Nash. Their breakdown was £8,202 on the contractor, £1,771 on traffic lights, £340 on highways, £300 on removing a willow and £631 for additional works. Some of this (including traffic lights and highways charge) would not be needed in Nash.

The Freshwater Habitats Trust recommend this method of desilting a pond. They recommend that draining should take place in September, when water levels are at their lowest and areas of more-solid bare mud may be exposed. This time of year has the additional advantage that plants are likely to be dormant and wildlife also will have finished breeding and in some cases will, quite literally, have flown.

For the Nash pond, the sleeper 'dam' under the bridge would be removed and the remaining water in the pond would be pumped out downstream at a slow rate to ensure that there is no flooding further downstream.

This method of desilting also ensures that the majority of the roots of invasive sedge and other weeds are removed, which will make it much less likely that these species will regrow at a later date.

3 Pumping out silt without fully draining the pond
A member of the local farming community has told us that a company has recently been advertising in a reliable farming publication offering their services for cleaning ponds. They specifically state that they do not require the pond to be drained but, using their equipment, can remove build ups of silt from the bottom of any pond using pumps alone and then remove that material as part of their service. It is perhaps worth contacting them for a quote on how they could help with the Nash pond.

Whichever method is adopted, it should be borne in mind that, after digging out, some time and money may need to be spent rebuilding the impermeable layer if this has been damaged. Since this layer is natural in Nash Pond, this is less likely to be an issue.

The Freshwater Habitats Trust also recommends that, for the sake of both wildlife and aquatic plants, a shelf is left around the edges of the pond that is shallower. This would also have the advantage of being safer for children, dogs and horses which might decide to throw themselves into the pond.

Prevention of re-silting
Removing the silt that has built up over many years is an important step. Ideally, it would be a good idea to take steps to prevent re-silting in order to avoid having to remove silt building up in the future.

There would be two options which might stop silt coming down the stream on the south east side of the pond:

- The first would be a reed-bed, an engineered structure that uses natural processes to break down organic matter in water. It would be created along a stretch of the stream flowing into the pond and would clear the water of silt flowing down the stream before it reaches the pond. Disadvantages would be that the area needed for the reed bed is substantial – at a very rough estimate fifteen by one metres, but expert advice would have to be obtained to determine this precisely.
- The second would be a sediment trap, a 'settling' part of a stream formed by excavation that catches and holds sediment-laden runoff while water runs into the stream. It involves deepening part of the stream flowing into the pond to allow sediment to settle before it is taken further downstream and would be about 5-7 metres in length and about half a metre wide.

Both of these methods of preventing silting of the pond require annual maintenance and would require the permission (and probably assistance) of the landowners, John King and Sarah Denne. Land can change hands from time to time and these agreements cannot be written into sales documents, so even permission from current owners might not be enough in the future.

If the stream were the only source of sediment, these options might be worth considering but at least half of the sediment in the pond comes from the pipe in the south west corner, and so, in addition to the maintenance of the silt bed or sediment trap, the pond would still need to be cleared of sediment on a regular basis.

It might be better to accept that the pond will need to be desilted from time to time. The current quantities of silt have built up over many decades, and maintenance might not be needed for several years once the current quantities of silt have been removed.

A suggestion has been made that a series of islands could be put in the pond to direct and speed the flow of water through the pond, but there would need to be several islands to direct both inflows, which might detract from the pond. It might also not be in keeping with the historical look and use of the pond.

Removing overhanging trees and shrubs
The removal of dead vegetation and cutting back of some of the overhanging branches would be beneficial and could more easily be carried out when the pond is drained.

Removing invasive species
If the pond is drained and de-silted as above, then the vast majority of the roots of the invasive species will be removed and regrowth will be minimal. Some volunteer removal of roots could be carried out while the pond is drained if this seems necessary. Planting of native species will make these weeds less likely to return.

Improving the water chemistry
According to the survey carried out in 2020, all that is needed to improve the water chemistry is the removal of silt and excess vegetation. If the above steps are taken, no further work should be required.

Ensuring that the pond retains water all year round
If the pond is made deeper as suggested above, it is likely that, even if the water level is reduced in the summer, the pond will always retain a substantial amount of water. No further action would be required.

It will be necessary to define what the village regards as the optimal water level of the pond. We want to ensure that the pond no longer floods roads, as it does most winters, often for an entire day. On the other hand, we do not want to see it reduced to a mud flat in summer, for both aesthetic reasons and for the sake of local wildlife.

Stopping Wood End from flooding
Flooding has been much reduced with the insertion of a sleeper acting as a dam to keep the water in the pond. The risk would be further reduced by clearing the pipes that run under the road and by stopping them from becoming blocked again by covering the 'peninsula's with mesh.

Making the pond more wildlife friendly and attractive
Once the invasive plants have been eradicated, indigenous marginal and aquatic plants can be introduced which will serve to attract wildlife and make the pond look more attractive to residents.

Removing the land 'peninsula'
The clearing of the land peninsula was recommended in the 2020 survey to prevent the build-up of silt. If this is done, the vegetation which has grown on it should be removed first, and then the silt build up removed with the rest of the silt in the pond.

Placing of signs
Suggestions have been made that historic / and or wildlife signs are placed, perhaps near the seating area. This is something that could be considered as part of this project. A number of historic signs placed through the village might also be thought worthwhile, perhaps as a result of the history project currently being undertaken by Councillor Shekar.

Others
There are two posts – one on either side of the bridge. Unless they have any historic significance, they could be removed since they are unsightly.