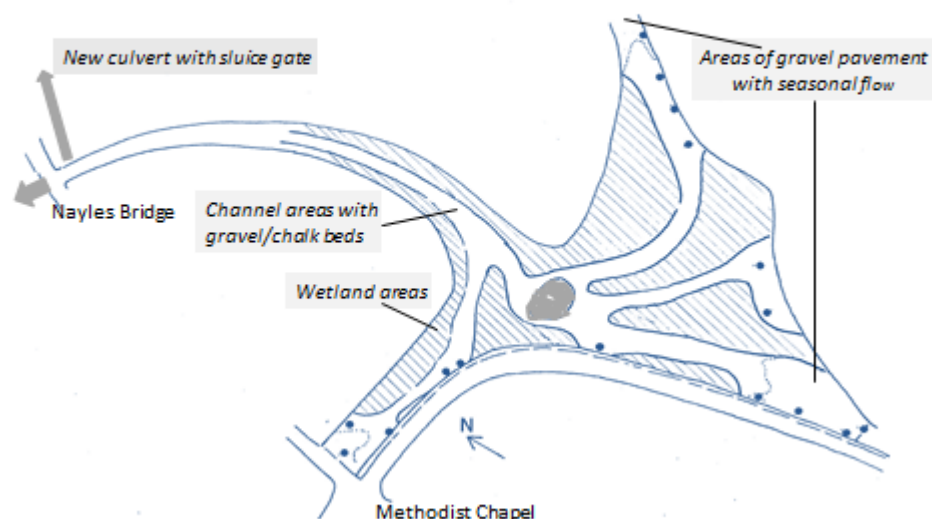


MILLBROOK PROJECT UPDATE – THE CLEVE

A village working group (Sustainable Blewbury Millbrook Project), aided by the Environment Agency, two consultants and a grant from the Trust for Oxfordshire's Environment (TOE2), has made background studies and drawn up recommendations for future funding to restore the hydrology, ecology and landscape elements of the Cleve.

Despite the considerable amount of work so far undertaken, we have decided to call off – at least for the foreseeable future – any new work to restore and improve the Cleve. The current position is that all available data for the hydrology and ecology of the Cleve has been analysed as a basis for any future work. However, grant bodies advise that any funding will depend upon having outline consent from all riparian owners (those bordering the water). This is because the Cleve is a 'common pool resource' with multiple ownership. There is agreement from consultants and public bodies that the proposals represent the best way forward for Blewbury. However we do not yet have unanimous consent from riparian owners, which means that the plans must be put on hold. An integrated solution for the Cleve as a whole, in which all village interests are represented, is essential. A wider village consultation would only be taken once owners' agreement was secured; no further actions or expenditure can be undertaken without acceptance that this is a community project. At some future date we hope it may be possible to take these proposals forward.



Conceptual plan of the Cleve restoration showing locations of principal springs, suggested areas of channels and wetlands (shaded)

Causes of the ecological decline. Surveys of the water quality, silt, bed levels and inflow/outflow drainage have been carried out. It is concluded that the main cause of the poor ecology is the long-term accumulation of silt, which is oxygen-poor due to lack of flow-through, high turbidity and reduced oxygen diffusion. High nitrate concentrations from downland arable sources, and to a much lesser extent orthophosphate from duck feeding, also contribute to the problem. Phosphate concentrations – another concern – are manageable.

Cleve remediation. The draft remediation plan is based on re-creating channels to improve flow and silt transport across the Cleve from the spring discharge areas, with a net reduction of the surface area of flowing water. Channels would be created using faggots (wood bundles) and some bank restoration would be carried out to provide habitats, e.g. for protected species such as native crayfish and water voles, and planting of a greater diversity of wetland plants. Interfluvial areas would develop naturally as wetlands (e.g. fen meadow).

Channel creation requires some re-grading of the bed profile using imported chalk and gravel. Silt removal would be on a small scale and transferred to the non-flowing wetland areas. The transition

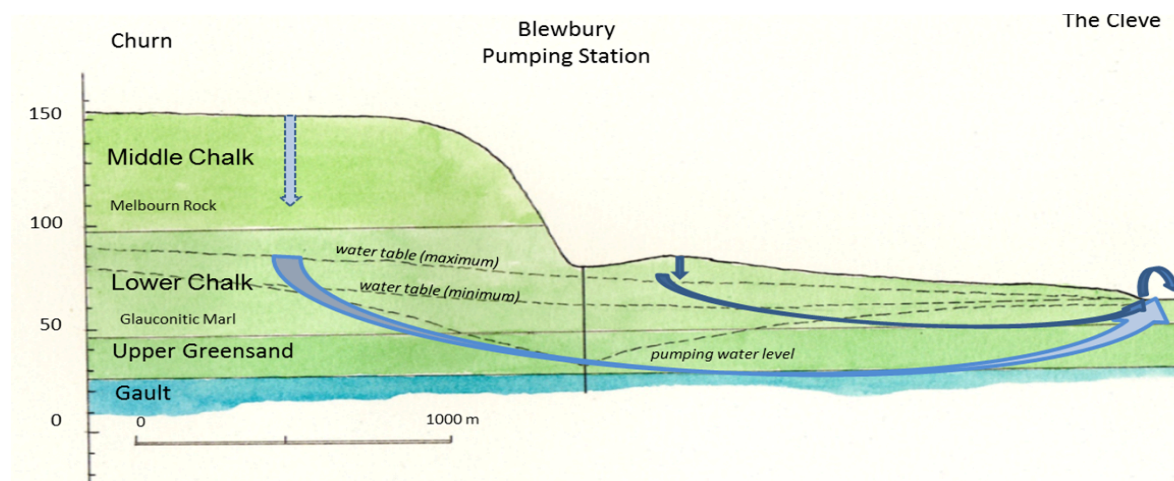
and recovery from the present open 'pond' to a more dynamic waterscape would be a long-term process, possibly tackled in stages.

Regional context. Similar restoration work has been achieved by the Environment Agency on chalk streams elsewhere in the North Wessex Downs, but the present springs-based study would be unique. By reinstating these valuable chalk-stream headwater habitat types, the Cleve project would fit in with the wider chalk stream conservation objectives for the North Wessex Downs AONB.

Inflows. It is concluded that seasonally variable groundwater from both deep and shallow sources is the predominant *inflow* to the Cleve via discrete springs and seepage; these do not need any attention, apart from protection. Surface inflows are of short duration and volumetrically negligible. They are predominantly rainfall run-off and carry little if any pollution.

Outflows. The current *outflow* through Nayles Bridge is inadequate and leads to frequent blockages. Natural drainage was formerly to the north but this flow is now restricted; however the outflow to the Play Close is an artificial, maybe medieval, channel.

Improved drainage. The main proposal would be to create a new open channel (e.g. 60cm width) to the north, controlled by a sluice so that environmental flows can be maintained under all discharge conditions using either channel. We have taken advice on drainage and channel creation from VWHDC who support the concept of a new channel with a lockable sluice gate, removing the present culvert. This would require formal land drainage consent and VWHDC have offered to help expedite this.



Geological cross-section (south to north) towards the Cleve, showing that there are probably two contributing flow systems

We continue to monitor groundwater levels, invertebrate species and long-term flow records for the Millbrook. We plan to analyse these in relation to historical rainfall levels and as a way of understanding better the recent high groundwater levels, which have origins in local and regional flow systems. We also look forward to the results of an MSc dissertation (Reading University) on the origins of the silt. It is planned to resume discussions with the Environment Agency to express our interest in working together to regularly monitor the water quality and flows, and with VWHDC to explore the feasibility of opening the North Stream across Church Road as far as Watts Lane.

We also continue to discuss with the Local History Group the archaeological evidence for diversion of water from the Cleve to the Play Close in historic times in light of the geological evidence.

*Sustainable Blewbury Millbrook Working Group
September 2013*