

Snipe Marsh 26th September 2014

The purpose of these notes is to respond to comments made in a meeting on 21st August at Dragonfly House, Norwich. At which the Environment Agency informed me that there was a potential "in-combination", with the Anglian Water's borehole at Ludham, effect on the ecology of Snipe Marsh from both my boreholes. These are my initial thoughts on the gaps in responses made to the Environment Agency regarding Snipe Marsh but they do not represent my full list of concerns.

I have met Edward Boardman, whose family own Summer House Farm and Cobbs Farm of which Snipe Marsh is part of their holding. He was very knowledgeable about Snipe Marsh and the recent changes on the marsh that the Broads Authority have brought about.

Water Level Management on Snipe Marsh

Surface water enters Snipe Marsh via a pipe under the public road marked "1" on the attached map. This water mainly comes from 8 land drains in the fields Clarkes and Nudds plus some water from the houses and roads alongside Sharp Street. These land drains run all year and the ditch always has water in it. The land drains are also picking up surface lateral water from the East side of Ludham Road. The flow of water in these drains does not appear to be affected when my Ludham Road borehole is pumping. I believe that this water is from soil above the clay layer, which is why pumping does not affect the flow.

On 26th September the water level in the piezometer called "Clarke's" (marked with a red cross on the map) was 1.85m below the top of the piezometer. The water level in the adjacent ditch was about 0.92m below the top of the piezometer. This piezometer is 15m deep and certainly below the clay layer but the piezometer water level was 0.93m below surface water level.

Snipe Marsh water level control

There are two water control pipes in Snipe Marsh, marked "2" & "3" on the map.



These maintain the ditch level at the desired level. Both Edward Boardman and myself have never known the water level to fall below this level as water is always entering the marsh.

Snipe marsh water level control- marked 3 on map

The water level below these water level control pipes then drops about 4-6 inches for the remainder of the marsh. Edward Boardman thought that somewhere to the South West of his land was an earth bund over which the water past but that is on How Hill land. The exact purpose of this bund is unknown.

The remainder of the marsh, outside these water control pipes appears to be controlled at the same level as Crome's Broad.

There are also foot drains cut into the remainder of the marsh at regular intervals to facilitate water movement. This is the area that the Environment Agency indicated that S24 species were present. However the site was not dominated by *Phragmites Australis* (Common reed) this is probably because the site is at too high an elevated position and too dry to get good conditions for reed growth.

2009 Main Sluice

According to the Broads Authority Site Management Plan of How Hill 2011/12-2015/16 by Erica Murray this sluice ("4" on map and picture below) was installed by BESL as part of the flood defence work in 2009. This was a replacement for the previous sluice and the site has been in isolation from the river since 1992. The management plan aims to keep water levels at marsh level from January to April and no more than 45cms below marsh level between June and October. This fits with observations on Snipe Marsh of the water levels in the remainder of the marsh being 4-6 inches lower than the water control pipes.

I have visited the sluice 4 times since 21st August and on every occasion the river water level was higher than the internal levels by 4-10 inches.



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Main sluice with higher

How Hill Site Management Plan 2011/12-2015/16

As previous mentioned the aim is to keep water levels in the site at no more than 45cms from marsh level. The plan states that water evacuates the site near Toad Hole Cottage and is pumped into the river downstream at Ludham Bridge. This must mean that the levels in How Hill and part of Snipe marsh are kept artificially low

during the period June-October and certainly below river level. Edward Boardman's and my observations on Snipe Marsh conclude that this appears to be the current management.

On a visit to Toad Hole cottage on 26th September the water flow over the Toad Hole sluice was about the same volume as the flow down the water level control pipe on Snipe Marsh.

Snipe Marsh. Current management by Broads Authority

The Broads Authority cleaned out and deepened the ditches in Snipe marsh during the winter of 2011 and 2012. The reason Edward Boardman gave me was that they wanted to dry the site off to enable grazing by ponies. It is not known when the foot drains and water control structures were installed but it is assumed that it was about the same time. I believe that these new water control structures are a replacement for the previous structures. The artificial water level does seem to be marginally above the foot drains which would enable water to access the marsh regularly, giving ideal conditions for S24.

Snipe marsh is too wet to graze with conventional farm livestock but there are 4 Welsh ponies grazing Snipe marsh during the summer months. This seems odd management with S24 species present.

Crome fishing lake

This is situated about 30m South of water control pipe "3". It is managed by Edward Boardman as a fishing lake. It is vital that water levels and flows are maintained through this lake to keep the fish in prime condition. Edward Boardman has never known a problem with water flows or water levels in this lake. He does not believe there are any problems with water abstraction on water flows or levels on Snipe marsh.

Water Quality

Erica Murray and Sue Stephenson (Broads Authority staff) told Edward Boardman and myself that the main sluice "4" on the map was installed to prevent dirty water entering the site and now the water in the river was much cleaner they did not know why the sluice was in place. This is different to Erica Murray's site management plan but the reluctance to remove the sluice is clearly having an effect on water levels on How Hill and Snipe Marsh.

Groundwater below the clay layers at Catfield tends to have a high Iron content and where it does come to the surface stains the soil with Ochre. Having inspected Snipe Marsh with Edward Boardman and ecologists, there are no signs of Ochre on the marsh. In fact the water quality looks very clean.

Sharp Street Marsh Sluice

The sluice (marked "5" on the map) controls water movement between the river and Sharp Street marsh. The sluice here seems to be working very well. The sluice has a hole about 15 inches long and 4 inches wide with a thick rubber flap on the marsh side. As the river level rises in response to tides, the hydraulic pressure on the river side opens the flap and allows water to access the marsh. When the river level drops the flap closes. A simple system that allows water movement across the marsh with minimum management input. This is exactly the same design as the main sluice on Catfield Fen but that sluice does not work as well.

Anglian Water Pump Test

During the 2002 Anglian Water pumping test water levels in the ditches at Snipe Marsh were monitored and it was concluded by HIS Ltd that the ditch water levels fluctuated in response to rainfall and not the abstraction at AWS Ludham. I can confirm that after rainfall, there is more water flow in my ditches leading to Snipe Marsh.

Conclusions.

If HSI Ltd concluded that Anglian Water's pump test was not having an effect on the water levels in Snipe Marsh, How can my Ludham Road bore possibly be having an "in combination" effect on Snipe Marsh when the groundwater levels are lower than the ditch water levels? My Plumsgate Road bore cannot possibly be having an effect.

Looking at the ecology of Snipe Marsh and the effect of abstraction on the integrity of the European Site. With drain water constantly flowing into the site from Sharp Street, with water control pipes in place and flowing constantly, with the remainder of the site managed at a lower level to feed foot drains and keep the site dry in the summer months, how can Anglian Water's and my abstractions be having an effect on the integrity of the site? To prove the points about ecology, I have employed Applied Ecology Ltd whose initial view is that the site is well managed and there are no issues with the S24 species present. They have come to this conclusion because the site's water levels are all controlled with foot drains allowing water to access the marsh surface.