Wilson's Pool, Hayle Estuary & Carrack Gladden SSSI: Options for restoring the saltmarsh to 'Favourable' condition.

Introduction

Up until at least 1985, Wilson's Pool was flooded on every spring tide (per obs) and as such was an important component of the Hayle Estuary & Carrack Gladden SSSI, attracting large numbers of waterbirds (see Table 1 appended for species occurring to end of 1992).

Following flooding issues in the town over a number of years**,** the construction of the Angarrack Stream Flood Alleviation Scheme (FAS) commenced to help alleviate this. The FAS was completed in 1983. To address flood risk further, the Environment Agency have subsequently restricted the volume of seawater entering Copperhouse (and hence Wilson's Pool at the far eastern end) and as a result the saltmarsh at Wilson's Pool no longer receives tidal inundation. Consequently the saltmarsh is reverting to a dry or freshwater system (in periods of rainfall) and although a recent assessment of the SSSI condition was found to be 'Favourable' for the rest of the SSSI, Natural England's assessment here was deemed to be 'declining' and 'at risk' (NE 2010b). Clearly saltmarsh needs saltwater so this came as no surprise!

As Wilson's Pool is now dry for most of the year, is has become increasingly popular with dog-walkers and as such there is very little bird interest there now as disturbance is too high and the ground too dry to support waterbirds. In addition the removal of the bankside vegetation along the recently (spring 2013) widened footpath along the north side has opened up the access from here directly to the area and has brought an increase in pedestrian and dog traffic from an area that was previously largely inaccessible.

In recent years there have been two major studies undertaken to investigate whether it might be possible to allow at least some tidal inundation to occur at Wilson's Pool and this paper attempts to summarise the findings of these:

1. Dave Turner (June 2008). Copperhouse and Wilson's Pool Tidal Inundation and Flood Risk. Environment Agency.
2. Royal Haskoning (23 March 2012) Water level Management within Wilson's Pool. Final Report for Environment Agency/Natural England. 9W9532

Recent flood events at Wilson's Pool.

Following years without any tidal inundation, Wilson's Pool was flooded on 6th May 2008 by the Environment Agency under a 'controlled test' (Turner 2008). This experiment established that "a published predicted level of 6.7m high tide (chart datum for St Ives) is a high enough tide level to flood Wilson's Pool". This equates to ordnance datum of 3.3m AOD. Crucially, the Environment Agency's high level warning alarm kicks in at 6.8m (chart datum) or 3.35m AOD so allowing water to rise to this level would not be acceptable. Nevertheless, as Turner states (2008), "Using a 6.7m predicted high tide for St Ives does give opportunity to flood Wilson's most months throughout the year, rather than choosing a higher tide which, if not controlled would give greater flood risk".

Frustratingly, five years on we have seen no further tidal inundations since the Environment Agency's test.

Current tidal level restrictions set by Environment Agency.

As stated above, the high level warning alarm at Copperhouse is set at 6.8m (chart datum) or 3.35m AOD. This is the maximum level that the Agency would allow before the flood risk to the town is deemed too high. However, the flood alleviation gate at Copperhouse is actually set at 2.5m AOD, 850mm below

this to reduce the flood risk to the town. As the Royal Haskoning report identified, this is way below the level needed to allow any tidal inundation to occur at Wilson's Pool.

What is the minimum level required to flood Wilson's Pool with seawater?

Although Turner (2008) acknowledged that a 6.7m CD (3.3m AOD) tide would completely flood Wilson's Pool, the Royal Haskoning report identifies that a **6.5m CD (3.1m AOD)** would also do the trick. The extent of flooding @ 3.1m AOD is well depicted in their *Fig. 4.1 Inundations at Wilson's Pool at 3.1m AOD and 3.3m AOD* on page 22 of the report. Their comments in relation to flooding at this level are copied here:

'4.1 Option 1: Increase water levels in Copperhouse Pool and therefore Wilson's Pool to allow more frequent inundations whilst maintaining the current standard of flood defence as per the Angarrack FAS (1 in 50 year design standard) by raising the general flood defence levels.

This option would allow for inundations to occur on a significantly more frequent basis than those currently observed whilst still providing sufficient flood storage capacity for a1 in 50 year flow (15.5m3/s) from the Angarrack Stream during periods when Copperhouse Pool and Wilson's Pool are tide-locked by raising the general flood defence levels (crest and condition) for large sections of the frontage. This will result potentially in the water levels within the pool being higher than those observed in the observations undertaken in May 2008 as the fluvial flow will be stored above the proposed tidal level of 3.1mODN.

In relation to saltmarsh requirements (as outlined in Section 3), this would enable Wilson's Pool to be inundated approximately 150 times a year. This calculation is based on a tide height of 6.5mCD or higher at St Ives (the tide level required to inundate Wilson's Pool to 3.1mODN). It should be noted, however, that this relates to the inundation of the plateau of the pool rather than the creek system which would be inundated even more frequently. Wilson's Pool is generally a flat lying area (gradient 0.4%) existing above 3mODN with small channels and the Mill stream flowing at lower levels through the pool. Initially therefore the channels will fill up and empty until such time as the tidal cycle reaches 3mODN when a significant area of the pool is inundated.'

Recommendations

Because the Environment Agency's flood defence operation has set a level at the flood alleviation gate to prevent flooding of the town at 2.5m AOD, this has meant that Wilson's Pool has been starved of seawater ever since this initiative was introduced. As such the condition of the saltmarsh has deteriorated and is now 'at risk'. In effect, by adopting this drainage strategy, the Environment Agency has, perhaps inadvertently, damaged the SSSI.

Although it is acknowledged that allowing seawater entry to Wilson's Pool to maintain the saltmarsh by inundating "approximately 150 times a year" @ 3.1m AOD is perhaps unrealistic in practical terms, it is our recommendation that during the regular summer impoundments for watersport recreation (up to 6-7 weekends/year), consideration should be made to accommodate an impoundment at 3.1m if weather conditions allow. In 2013, there have been many such (dry) weekends when allowing seawater in to this higher level could have taken place – much to the benefit of the people in the town who use the adjacent Pool for watersports as well as to the flora and fauna of this important SSSI.

References:

Dave Turner (June 2008). Copperhouse and Wilson's Pool Tidal Inundation and Flood Risk. Environment Agency.

Natural England (2010b) Hayle Estuary and Carrack Gladden SSSI Condition assessment March 2010. Updated re unit 2 sand dunes (July 2010)

Royal Haskoning (23 March 2012) Water level Management within Wilson's Pool. Final Report for Environment Agency/Natural England. 9W9532.

Appendices

Table 1. Important bird species at "Wilson's Pool" to 31.12.92.

RDB species	
Shelduck:	Has been seen with young on site when area flooded. It breeds in the nearby Hayle Towans.
Wigeon:	Uses site when flooded from estuary on spring tides.
Teal:	Ditto but also uses numerous small dykes and rain-water pools.
Spotted Crake:	Recorded from the reedbed on passage.
Oystercatcher:	Feeds here occasionally.
Ringed Plover:	Ditto.
Temminck's Stint:	Recorded on passage.
Dunlin:	Feeds here occasionally.
Ruff:	Recorded on passage.
Whimbrel:	Recorded on passage.
Curlew:	Feeds here occasionally.
Redshank:	Feeds here occasionally.
Greenshank:	Feeds here occasionally.
Wood Sandpiper:	Recorded on passage.
Med Gull:	Seen roosting on site when flooded.
Little Gull:	Seen roosting on site when flooded.
Firecrest:	Seen wintering in reedbed.
Bearded Tit:	Recorded on passage. Last recorded (7) in Oct.1992.
Serin:	Recorded adjacent to saltmarsh 1992 as possible breeding pair.
Candidate RDB species	
Lapwing:	Feeds here occasionally.
Snipe :	The only site at Hayle where this species occurs. Count of 60 birds in Jan. 1991.
Kingfisher:	Regular on passage every year here.

Sand Martin:	Ditto.
Swallow:	Has formed large roosts in reedbed in autumn, numbering thousands of birds.
Yellow Wagtail:	Has bred (with Blue-headed Wagtail *M.f.flava*).
Dipper:	Recorded from the river here in past.
Whinchat:	Recorded on passage.
Stonechat:	Recorded on passage.
Wheatear:	Recorded on passage.
Sedge Warbler:	Recorded on passage. Has bred.
Whitethroat:	Recorded on passage. Has bred.
Linnet:	Resident and passage migrant. Breeds?

<u>Other species</u>

Grey Heron:	Occasional
Spoonbill:	Occasional
Little Egret:	Occasional.
Mute Swan:	Uses site when flooded.
Mallard:	Ditto.
Water Rail:	Occasional in reedbed eg. 5 Nov-Dec.1991.
Little Ringed Plover:	Occasional on passage.
Little Stint:	Occasional on passage.
Jack Snipe:	The most regular wintering site in Cornwall? Up to 7/day recently (Dec.1990).
Pied wagtail:	Has roosted in reedbed. Up to 169/night Jan.1985.
Grasshopper Warbler:	Has been recorded in summer from reedbed.
Aquatic Warbler:	Has been recorded in autumn from reedbed.
Reed Warbler:	Has bred in reedbed. Still does?
Water Pipit:	Annual winter or passage migrant.
Reed Bunting:	Winters in reedbed. Breeds?

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