River Crane – Cranford Park

A Project Proposal by the Wild Trout Trust December 2015

1. Introduction

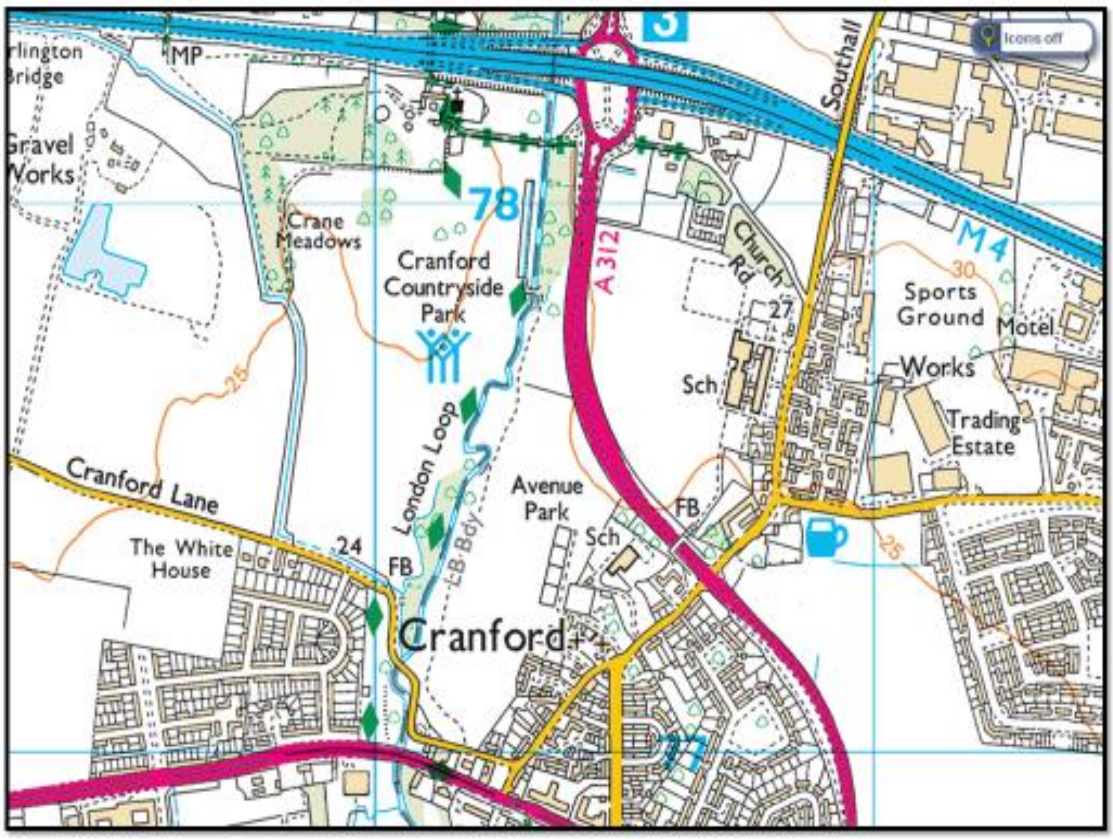
This report is the output of a site meeting and walk-over survey of a 1-km stretch of the River Crane at Cranford Park in West London. The site inspected extended from National Grid Reference TQ 103781 down to TQ 100771. The river is classified as being in poor ecological condition under the Water Framework Directive assessment (Water body ID no GB106039023030).

The request for the visit came from Mr. Gareth Ryman, who is the Borough Ecologist for the London Borough of Hounslow.

Mr Ryman is looking for opportunities to undertake ecological enhancements to the river corridor and is keen to explore options for in-channel and riparian habitat management.

Comments in this report are based on observations on the day of the site visit and discussions with Mr. Ryman and Chris Slake (Senior Ecologist), Alison Shipley (London Borough of Hillingdon), Neale Hider (Environment Agency) and Mr. Rob Gray, Chairman of Friends of the River Crane Environment (FORCE).

Throughout the report, normal convention is followed with respect to bank identification, i.e. banks are designated Left Bank (LB) or Right Bank (RB) whilst looking downstream.



Map 1 Crane at Cranford Park. © Streetmap

2. Catchment overview

The Crane is an extensively modified water course. Rising from springs north of Hillingdon, the river flows for approximately 14km through a heavily developed urban landscape. Flow is augmented by the Yeading Brook tributary before the river swings south, skirting the eastern periphery of Heathrow airport. The Crane is then joined by the Duke of Northumberland River (DNR) at North Feltham. The DNR is an entirely man-made aqueduct and receives water via a distributary channel from the River Colne, augmenting flow into the Crane before giving its name again to the northern-most channel, which splits off from the main Crane below Knellor Park.

The River Crane is classified under the Water Framework Directive (WFD) as a Heavily Modified Waterbody and is assessed as having poor ecological potential.

3. Fishery overview

From information supplied via EA fishery surveys it is apparent that the Crane is capable of supporting a wide range of fish species, including some important so-called minor species such as bullhead *Cottus gobio*. Bullhead are normally associated with good quality river environments and are a protected Annex 2 species under the Habitats Directive.

Upstream recolonization for most fish species from the main River Thames is impossible due to several impassable structures and it is likely that the re-establishment of a diverse and healthy fish community has relied mainly on downstream drift, in all probability from juvenile fish dropping out of the Colne via the DNR. A possible exception is the presence of eels *Anguilla anguilla* which may be migrating up from the Thames and negotiating structures impassable to fin fish migration, but possible for eels. It is also possible that eels previously found in the Crane may have found their way into the system through downstream movement to populate vacant habitat niches.

There does not appear to be any reference to the Crane ever supporting a viable salmonid population. Some small trout *Salmo trutta* may migrate downstream through the system via rivers like the Chess and Ver, into the Colne and then out to the Thames via the DNR and Crane. Some of the wild trout populations that populate the upper Colne and tributaries may well be genetically predisposed to downstream migration as juveniles.

The Cranford Park reach lies upstream of the DNR/Crane confluence so any recolonization of this reach assumes a viable fish community residing in the upper reaches of the Crane and the Yeading Brook, or the ability of fish to be able to migrate up from the DNR confluence. An assessment of weirs and structures in this reach is essential to ascertain whether the upper Crane is available to fish dropping out of the Colne system.

A realistic objective, given the inevitable water quality issues associated with such an urban catchment is for the Crane to be able to support a diverse range of native coarse fish and a healthy stock of eels.

3. Habitat assessment

The first 150m of river running downstream from the access bridge to Cranford Park is contained within a highly modified and straightened channel. It is understood that this channel was created as a bypass for the original course of the river, which was modified to support a series of ponds, now no longer evident, which are thought to have been constructed on the natural course of the river.

The LB (eastern bank) is comparatively heavily tree-lined. Where pockets of light hit the channel some beds of starwort *Callitche sp* (Photo 1) and fennel pondweed *Potamogeton pectinatus* were evident.

Photo 1. The odd bed of starwort was present in areas of direct sunlight.

The river margins were generally well covered and "rough" providing some good habitat for both invertebrates and fish. Some good examples of coarse woody debris (photo 2) providing excellent refuge areas for fish, habitat for grazing invertebrates and nesting opportunities for birds could be seen.

Photo2. Coarse woody debris providing good quality habitat adjacent to beds of fennel pond weed.

Of particular concern was the presence of several small beds of floating pennywort *Hydrocotyle ranunculoides* (photo 3). This highly invasive non-native plant is known to cause huge problems on water courses where it spreads rapidly, shading out the river bed and clogging up channels with potentially huge rafts of floating leaves.

The presence of this particular plant on the Crane system may well drive future management options. The plant is known to thrive in slow flowing, open systems with plenty of available sunlight. Opening up the canopy in an attempt to improve macrophyte communities may simply provide new opportunities for this unwanted visitor to establish. In addition to this plant failing to thrive in shaded areas, it will also struggle when flow velocities pick up. Hence any reach upstream of a weir or structure that slows down water velocities will be more vulnerable to colonization than un-impounded sections with a more natural channel form.

Photo 3. An established bed of floating penny wort in a sheltered margin with access to plenty of direct sunlight.

The end of this section is marked by a bridge and the remains of an old level control structure which has been largely removed. From this point downstream the river takes on a more natural, meandering planform, with well-established shading derived from mainly alder, crack willow and mature sycamore trees lining both river banks.

Fallen and partially fallen trees (photo 4) were relatively abundant, providing ample quantities of valuable woody debris within the channel. Most of these were considered to be relatively stable and posing no unacceptable risks, however, care must be taken to ensure that full channel width debris dams do not quickly build up adjacent to large, partially fallen trees. Retaining the partially submerged and valuable trunk sections and reducing the bulk of material above the surface will help to retain the features, as well as reduce their capacity for forming debris dams, thus reducing local flood risk.

One such dam has already formed (photo 5) and is starting to impound the channel. It is recommended in cases like this that a watching brief is kept to ensure the dam does not collect further woody material. In this particular case it is recommended that a section of the blocking trunk is cut away to avoid the full width dam rapidly becoming occluded with more debris.

Photo 4. A large, partially fallen tree still attached to its root plate. Cutting the main trunk and right hand branch will ensure the feature provides valuable habitat but without the risks associated with the root plate pulling a large chunk of the bank away and forming a blocking dam.

Photo 5. Full channel width debris dams should be notched to reduce flood risk and avoid excessive deposition in the reach above.

Several excellent examples of riffle habitat were evident on the lower reaches (photo 6). The whole area is gravel rich and where the channel has a modest gradient some excellent shallow riffles have formed, possibly in response to previous fallen trees scouring out bed and bank material. These sites are particularly valuable for a range of specialized plants, bugs and gravel spawning fish species. When selecting sites to allow more light penetration to the channel, shallow riffle sites respond well with the added benefit that there will be no additional risk of penny wort becoming established in these locations.

Photo 6. Shallow riffle habitat over a gravel bed. Dropping the upstream tree and securing it into the channel to form a half-channel width deflector will further sort and improve the quality of the gravels and create a valuable spawning habitat for a range of fish species.

One or two of these areas are obviously being heavily used for dog paddling (photo 7), which is potentially putting pressure on the banks and is almost certainly responsible for the channel becoming wider and shallower than it naturally should be. There is a point when the channel becomes so wide it results in the gravels becoming heavily infiltrated with deposited sediment. Some defensive planting, or the installation of brushwood berms in the margins will help to deter too much dog and walker activity and allow the channel to be slightly squeezed in selected areas, thus energizing flow and keeping in-channel gravels relatively silt free.

Photo 7. A potentially valuable spawning site adjacent to heavily trampled banks. Strong tree root systems are giving the banks some protection although some brushwood pegged into the margins will also help protect the banks, deter dogs and provide habitat for bugs and small fish.

4. Conclusions

Long sections of the Crane flowing through Cranford Park have a natural, well balanced channel supporting a valuable pool, riffle and glide sequence. The lower, semi-natural section of channel has a gently meandering planform and when coupled with the relaxed approach to managing fallen woody debris has enabled some excellent habitat to become established.

The upper 150m metres of straightened and impounded channel would benefit from the removal, or partial removal of the bed impoundment adjacent to the footbridge. Improved habitat could be introduced by installing marginal tree sweepers (diagram 1 photo 8) or brushwood berms (photo 9 and 10) in locations where sufficient light hits the river margins. Eradicating the floating pennywort from this reach is essential before contemplating opening up the tree canopy.

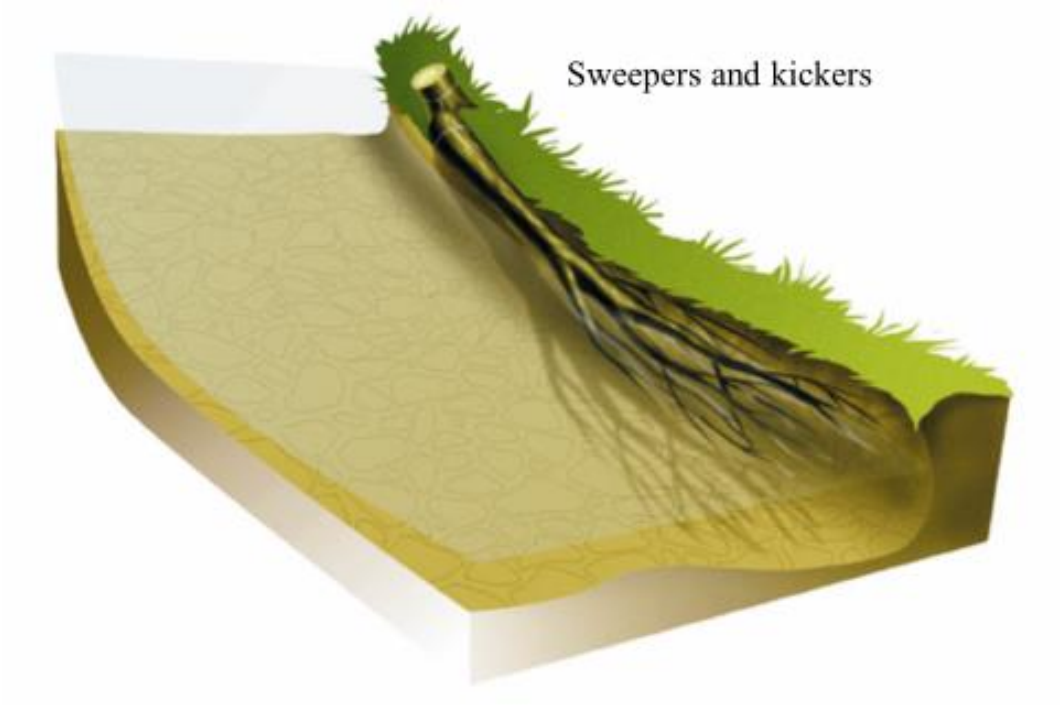


Diagram 1 Tree sweeper with galvenised cable used to attache the trunk to a secure stump.

Photo 8 tree sweeper

Photos 9 and 10. Typical examples of brushwood berms

The lower semi-natural section requires only a light touch. Occasional monitoring of fallen large woody debris is required and easing out sections of full width debris dams should be carried out to avoid large blockages and elevated flood risk.

Pieces of large woody debris could be secures onto shallow gravel riffle sections to help sort and clean gravels to optimise conditions for fish spawning.

The odd tree in this reach is suitable for hinging/laying into the margins (photo 11). This might be an option on sites where there is currently heavy footfall and dog dipping to help protect the banks. An alternative is to again install brushwood berms but only where there is sufficient light to promote regeneration of either live willow of marginal emergent plants.

Photo 11. An example of hinging live alder into the river margins**.**

5. Recommendations

- **Evaluate the extent of upstream infestation of floating pennywort.**
- **If pennywort is well established upstream retain as much shade as possible.**
- **Consider the possibility of lowering the impoundment adjacent to the footbridge to re-energise the flow on the upstream section.**

- **Consider the installation of brushwood berms or kickers on the upper reach to squeeze the channel width and elevate mid-channel water velocities.**

- **Regularly monitor fallen woody debris and ease out sections to ensure that full width dams to not become established.**

- **Consider installing brushwood berms or kickers adjacent to areas of bank under pressure from walkers and dog dipping on the downstream reach.**

- **Improvements to gravel quality can be achieved via the installation of large woody debris onto wide, shallow gravel riffles.**

Note: All work within 8m of the top of the bank will require a consultation with the EA and may require a formal written Flood Defence Consent prior to any work being carried out.

Acknowledgement

The WTT would like to thank the Environment Agency for supporting the advisory and practical visit programme.

Disclaimer