

The Value of the Tidal Crane Fisheries Habitat

Introduction

This document was initially produced by Friends of the River Crane Environment (FORCE) in 2016 for discussion with the Crane fisheries group. It has subsequently been updated to account for developments in 2017 and 2018. It remains a draft assessment of the value of the Tidal Crane – particularly as a fisheries habitat - and has been produced for information, comment and development.

One issue that FORCE had not appreciated until recently was the potential value of the tidal Crane reaches as a fish habitat. The river is open to inflows from the River Thames and is tidal for around 800 metres.

Looking through historical reports indicates that the Crane may be pretty much unique in providing fresh water tidal habitat off the main tidal Thames (though this may have changed with the removal of the tidal barrier at the base of the Wandle – see opportunity 6 below). Given that the tidal Thames itself has precious few places for fish to spawn this may indicate its value as a fisheries habitat for the Thames.

Relevant Issues

The following points are relevant to the tidal Crane as a fish habitat:

1. The lower Crane river restoration working group is looking at opportunities to improve the value of the lower Crane (including the tidal section). A vision document was produced in 2017 and a feasibility study, managed by Atkins, started in July 2018
2. The Northcote Nature Reserve (NNR) is being developed at the old Pit Park site (in the tidal reaches around 500 metres from the confluence with the Thames). This is being funded through LB Hounslow S106 and supported by a newly formed NNR Friends group. A design was developed in early 2018 and includes a new backwater creek as well as marginal river shelves. This design has been revised and developed following discussion with fisheries experts to better provide fisheries habitat. The NNR project has produced a detailed survey of the tidal river from the Northcote Road footbridge downstream for around 200 metres to the north end of the site. It has also undertaken sallow borehole investigations of the area. The next stage is to tender for the work with a view to the main construction works taking place later in 2018.
3. ZSL has started a major project investigating the value of the Thames Estuary as a fishery, following on from their work on eels and smelt. It will be important to feed into this project and see if it can help put the value of the tidal Crane into context and guide how it may be further improved. ZSL has submitted an HLF bid that would include detailed surveys of the tidal Crane.

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4. The EA are investigating improving the low flow along the lower Crane. A long term trial for this started in November 2017 and is progressing well
5. LWT has produced a report on the barriers to fish migration within the Crane catchment – including those on this tidal section
6. The half lock at the base of the River Wandle was removed in summer 2017. This will allow the creation of a comparable area of tributary tidal habitat and raises the potential of collaborative working for mutual benefit

FORCE attended the Tidal Crane Association AGM in November 2016 and raised this issue with them. An earlier version of this document was circulated to the TCA for further comment. It was also sent to the Crane Fisheries Group for discussion at the group meeting in December 2016. The document has been discussed and developed with the Friends of NNR and ZSL and sent to the EA and Steve Colclough at IFM, for their information and comment.

Site Characteristics

The main characteristics of the tidal Crane are as follows:

1. The Crane joins the River Thames in Isleworth, a few hundred metres below the Richmond half lock. It is therefore subject to the full tidal range at this location
2. The tidal reach extends for around 800 metres upstream to the A316 road crossing. There is a tidal barrier on the river at the Thames confluence but this is only closed during periods of flood risk
3. The river channel is reasonably natural in form for most of this length, although there are sections of sheet piling, rock gabions and other protections installed
4. The river flow itself varies from a few litres per second during dry periods to several cumecs following heavy rainfall. Note that following the long term flow augmentation trial in November 2017, minimum freshwater flows have increased to between 50 and 100 l/s.
5. Water levels vary through the twice daily tidal cycle from a low freshwater flow (minimum of 50 l/s and covering around half the river bed only) during low flow periods to a couple of metres deep or more around high tide
6. The bed of the river is reasonably natural, with pools and riffles. Some of the pools are deeper and remain at one metre plus depth during the low tide period.
7. The main substrate is building material (largely bricks and concrete with some flints etc), and areas of silt that may move around over the seasons
8. Note: Thames 21 has suggested that the Tidal Crane may be formally included as part of the tidal Thames catchment. This report has been sent to T21 for information and comment.

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Figure 1: Area of the tidal Crane – the arrow shows the site of Northcote Nature Reserve.

There has been no systematic assessment of the habitat value of the tidal section to our knowledge. However, there has recently been a detailed survey of its shape and geomorphology of a 200 metre length – including mapping of the substrate – as part of the NNR project.

This project also commissioned a Geotechnical survey of the ground adjacent the river bank, within the existing grassed site, as reported below:

“Several borehole samples down to a depth of about 4m below ground level, which is over a metre below river bed level. The layers varied, but generally showed silty clay from about 1m to 2-2.5m below Ground level. Alluvium (silty clay with bits gravel) between 2-2.5m and 3m below GL, and Brown sand/gravel (Kempton Park Gravel Formation) from 2.5-3m below GL and deeper. It’s all good ‘healthy stuff’ and probably lends itself to supporting the edges of fish habitat, but also quite soft, which is why we are adding the coir/rock role terracing to mitigate current erosion and consolidate existing habitat potential. It is also good news for the inlet excavation.

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So the intent is that the marginal planting and shelf being introduced will add to this potential habitat. Also being considered is the benefit of a couple of overhanging trees, including the large willow trunk, providing fish shelter. The form of the terracing is designed to incorporate and retain these. The tidal inlet has now been modified with a lip at its mouth and deeper internal excavation to retain a significant low tide pool, max depth 0.5m, but rising back about 20m into the site”.

Fisheries – background data

The following is an initial list **of fresh water species** potentially using both the Crane and the upper fresh water estuarine Thames below (subject to comment and development/amendment):

3-Spined Stickleback
Barbel
Bleak
Bream
Bullhead
Dace
Roach
Roach Bream hybrid
Common Carp
Mirror Carp
Chubb
Rainbow trout
Rudd
Pike
Perch

Marine species using the upper estuary and potentially the tidal Crane for shelter, breeding etc:

European sea bass
European smelt
Flounder
Thin lipped grey mullet

Specialist estuarine fish

Common goby

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Marine/fresh water species moving into/out of the river depending on their life stage

Sea trout (Brown trout)
European eel

Atlantic salmon use the tidal Thames in this area but there is no evidence as yet that they use the tidal Crane. River lamprey are referenced in the ZSL report but not noted elsewhere or specifically in the tidal Crane as yet.

TW noted he had seen large sea trout in the tidal Thames near Chiswick in 2016. See also the catch of a 3lb sea trout (along with 5lb and 7lb bream) recorded in the tidal Crane by KB at Percy Road in summer 2017.

KB also reported a conversation with SC (then EA senior fisheries officer) from 20 years ago where he said there was little spawning habitat in the tidal Thames apart from in the tributaries.

JP from ZSL sent through a couple of reports on the fish within the Thames estuary:

- The list of fish caught in the tidal Lea is very similar to that noted above – sand goby rather than common goby and two types of both stickleback and bream
- Fisheries data are collected at Richmond, Kew and Chiswick in the upper tidal Thames. Again the list is similar although there is a differentiation between sand smelt and smelt.
- Freshwater fish are said to be recorded only down to Battersea in the late summer although they can extend to Greenwich in the winter (though other reports indicate Tower Bridge as the lower limit – KJB). These are largely recruited from freshwater inflows with little or no breeding grounds for fresh water fish in the tidal Thames downstream of the Richmond half lock.
- There is believed to be a regular loss of fish from the Crane to the Thames – particularly given the very high flows (5 to 10 cumecs) during peak flow periods and the lack of refuge areas in the lower Crane. At present there is one major barrier (Mereway Road sluice) and around 13 minor weir barriers to the movement of fish through the tidal Crane and up the river. Note that the EA is proposing to replace the Mereway Road structure in 2020 with a new one incorporating a fish ladder.
- The Crane may therefore be a valuable source of freshwater fish recruitment for the tidal Thames
- The only other fish noted were sea lamprey, occasionally seen up to Richmond half lock

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- In spring 2018 there were several reports of a grey seal in the tidal Crane. It was seen over a reach of several hundred metres adjacent to the Cole Park allotments and around 700 metres above the confluence with the Thames

ZSL has recently produced a guidance document on the conservation of tidal Thames fish. This includes a detailed listing of the fish in different parts of the tidal Thames along with recommendations for measures to protect and enhance their habitat. It is a good and detailed report – however it does not reference the value of the tidal reaches of tributaries or the contribution of tributaries to the tidal stocks of fresh water fish. JP also references "The Tidal Thames" by Alwyne Wheeler, published in 1979, as a useful record of the historical value of the tidal fishery.

The ZSL project is linked to the development of a marine conservation zone for the Thames. This is designed to support fisheries of conservation significance – including smelt.

The EA conducts two surveys of the fish in the Tidal Thames every year at Corporation Island (in Richmond and just upstream of the tidal Crane entrance in Isleworth), typically in May and September.

A National Rivers Authority fisheries report from 1995 stated:

"Lower down the Crane in its tidal section (approximately downstream of Northcote Road) the river supports flounder and eel. This area was identified in the NRA fisheries survey of 1988 as an important habitat, acting as a major nursery area for freshwater and estuarine fish fry. The nursery site in the Crane forms one of the only freshwater low tide creeks on the north bank of the Thames between Teddington and the River Lee which gives it further value and the need for protection."

Fish Survey in August 2018

An initial fish survey was carried out around low tide on 19th August, using two 1.5m by 3m intertidal nets with a 1.5mm mesh, along with kick nets. FORCE Trustees, DG (NNR); Tidal Crane Association members as well as JP (ZSL) and SC (IFM) were present. The following observations were made:

- Eight species were found in total – stickleback; dace; chubb; stone loach; common goby; flounder; minnow and eel
- There were large numbers (100+) sticklebacks in the two pools immediately upstream and downstream of the NNR (around 500 metres above the Thames). Up to half of these were carrying fish lice – which is unusual for river fish and may be a function of the low flows and high temperatures this summer

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- Young dace – average 150mm and 2017 fish – around half a dozen in the same area
- Minnows – all sizes – around ten in total and all looking healthy. SC noted this was indicative of good water quality (see also below)
- One chubb and several stone loach in the same area
- There was one flounder and two common goby found in the lower pool. All were only a few months old and probably born much further down at the mouth of the estuary, working their way upstream on the high tide to use this habitat for the summer.
- The elver was around 75mm and this year's
- The team went downstream to near the mouth of the Crane at Railshead. Two pools were investigated and significant numbers of goby and flounder (10+ of each) were found
- A short kick sample (a minute or so) revealed several hundred gammarus as well as leaches – but no other invertebrates noted. This indicates a high concentration of gammarus as a key fish food

The presence of flounder and common goby indicate the continuity of the channel with the Thames and its use as an estuarine fish nursery.

The finding of most interest to SC was the "humble minnow". He reported:

"We have not reported this in any significant numbers in the upper estuary before, as far as I know. From personal experience, I can confirm that they are present right up at Teddington close to the weir pool, but the EA surveys downstream starting at Richmond very rarely pick them up. Minnow cannot tolerate any salinity at all, so are not likely to be found below Putney under any normal circumstance. What was also interesting was the size range present, with some very large and old individuals.

As you may have heard me note to some on the day, in my time as EA Fisheries Team Leader for the area, (1985-2002), we only knew of one minnow population across the whole of greater London in a small tributary of the upper Ravensbourne near Bromley. Such was the devastating impact of the former GLC on river channel form, that nearly all of London's smaller rivers were devoid on even minor species such as minnow, stone loach and gudgeon. In our first ever Ravensbourne survey in 1991, we found only sticklebacks throughout and six small roach in the only piece of significant habitat in 13km of river. All this in an urban stream with improving water quality and no direct sewage input at all. The minnows only persisted because the GLC had never "improved" the small stream. Very occasionally single minnows were captured downstream. Our first habitat improvements in the Ravensbourne in the mid 1990's proved to create insufficient habitat to all

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larger fish to hold in the stream and early stockings of chub and dace were washed out of the river completely. Later enhancement were much more effective.

In my days in the EA, large sections of the Crane were devoid of fish other than stickleback. Given the improvements that have now taken place, has the EA ever stocked minnow to the freshwater reaches of the Crane? If not, the minnows we found may represent an important local relic population that have survived in the tidal reaches of the Crane in a more natural riffle and pool habitat not impacted by the GLC.

I see you comment in your notes on the NRA 1995 report and a 1988 survey. I probably wrote both but no longer have a copies. We did not find minnows then as far as I can remember”.

Further Work Ideas

Comments are welcome on these notes plus identification of other interested parties for sharing and discussion.

The notes have been shared with the lower Crane restoration feasibility project team for information. They have also been sent to Thames 21.

Further survey proposals to augment these data would be welcome – whether as additional baseline data or following completion of the NNR works. JP noted that ZSL may undertake further surveys as part of the Thames Tideway works.

The progress of the Northcote creek development will be monitored with interest.

Opportunities for developing educational activities at the Northcote site will be discussed with the Friends group, IFM and ZSL. SC suggested NNR also talks to the Chiswick Thames education group and others for ideas and links.

Rob Gray FORCE: version 6.3. September 2018