



Written Representation WS1/13 : River Avon SAC and Sea Lamprey

Natural England advice

It is agreed that Sea Lamprey are a feature of the R Avon SAC and that adults are recorded and present in the freshwater part of the SAC upstream of the Christchurch Waste Water Recycling Facility (WWRF) and the water companies facility at Knapp Mill. The juveniles (*ammocoetes*) are likely to be present in the slower moving silted parts of the river.

There is no disagreement that Christchurch Harbour SSSI, SPA is used by Sea Lamprey both as adults and juveniles returning to the sea and is therefore considered to be Functionally Linked habitat.

The LURA 2024 has provided legal certainty that the Christchurch STW will be required to be upgraded in its level of phosphate treatment from 5.1mg/l phosphorus which is the currently agreed level at which waste water from the Christchurch catchment is discharged into the Lower Avon. On or before 1 April 2030 the water company is required to reduce the concentration in its discharged waste water to a permit level of 0.25mg/l Total Phosphorus as an annual average.

This is a very significant reduction in the level of phosphorous entering the Lower Avon and Christchurch Harbour SSSI, SPA.

The JNCC have noted a number of likely adverse effects on the Sea Lamprey in the report (Supporting documentation for the conservation status assessment for the species: S1095) cited.

1. input of fine sediment
2. phosphate and nitrate to rivers leading to eutrophication issues such as increased algal production in spawning areas and smothering of spawning gravels
3. discharges of both raw and treated sewage, industrial effluents and diffuse urban pollution
4. In river barriers such as weirs and fish ladders

These are effects considered individually:

1. The primary source of fine sediments is from agricultural activities including cultivation in the catchment. The Supplementary Advice for the River Avon comments "There are excellent examples of the features that the species needs for survival, including extensive areas of sand and gravel in the middle to lower reaches of the river where sea lampreys are known to spawn." There is considerable overlap in spawning habitat requirements for Sea Lamprey and Atlantic Salmon and it is concluded that this aspect of the species habitat requirements will not be affected by additional residential development in Christchurch and waste water discharges through the WWRF.

2. Increased nutrients leading to eutrophication issues: as noted below new residential developments in Christchurch are required to be phosphate neutral. The requirement for phosphate neutrality in the R Avon rather than both phosphate and nitrates is because the evidence available allows Natural England to conclude that it is the level of phosphates which is the factor limiting the excessive growth of algae in freshwater systems not elevated levels of nitrates. As noted above there are extensive areas of sands and gravels in the River Avon.
3. Discharges of both raw and treated sewage: additional residential development within the WWRf catchment is not per se likely to result in a change to sewage discharges because of nutrient neutrality requirements. The regulation of discharges to the river is the responsibility of the EA through its permitting and enforcement powers. New industrial discharges are regulated through both the planning system and EA permits, there are no proposals for such development and new proposals would come forward on a case by case basis. Diffuse urban pollution from new development is regulated by the Council on an application by application basis through design of Sustainable Drainage Systems (SuDs) and its operation of building regulations.
4. As noted there are in river structures which may well be acting as a barrier to Sea Lamprey movements eg the sluices at Knapp Mill in Christchurch. The day to day operation of sluices not be altered by proposals in the Local Plan.

The Written Representation raises the issue of low dissolved oxygen (O₂) in the Humber Estuary, on investigation of available historic water quality monitoring data for the Avon (<https://environment.data.gov.uk/water-quality/view/landing>) it is noted that there are very occasional incidents when there is increased suspended solids which may indicate an agricultural source of pollution. The dissolved O₂ in the river is generally at a 95% saturated level suitable for the associated range of fish species. However, depressed O₂ concentrations in spawning beds related to fine silt ingress can reduce salmon egg survival to hatching.

Christchurch Harbour SSSI receives water from both the River Avon and River Stour which have very large agricultural catchments. Unlike the nearby Poole Harbour SPA, Ramsar where there is substantial evidence of algal mats on the intertidal mudflats, this evidence of eutrophication is not seen in Christchurch Harbour.

There may be a number of reasons why this is the case for example:

- The harbour is a comparatively small area and water from the two rivers will pass through rapidly creating a high flow regime.
- The Harbour size and morphology is such that tidal flushing is also likely to lead to a short residence time for enriched river water.

There is also no evidence that oxygen levels in the estuary are a cause for concern.

As noted in the evidence submitted in the Written Representation, Sea Lamprey on migration pass rapidly through the lower river and estuary which both have good levels of dissolved oxygen, this behaviour is likely to minimise any harmful effects of existing levels of sediments or high nutrient levels.

The key aspect for the Inspector to note is that much of what the JNCC report comments on is also caveated with terms such as “may”, “could” and “some effect”. The report is a national summary of the species status. These terms reflect the scientific uncertainty about both the behaviour (migration) and relative importance of different adverse effects on the populations of Sea Lamprey. It must be recognised that they are a very elusive and seldom seen or reported species which are difficult to identify as well as survey quantitatively.

Conclusion

The primary driver for adverse effects in the River Avon SAC related to additional development pressures is high concentrations of phosphorous. This effect is avoided by the requirement for new residential development to be nutrient neutral for phosphorous. A mechanism is in operation to provide nutrient credits.

The EA reported in 2022 that the level of dissolved oxygen in Christchurch Harbour achieves a Water Framework Directive (WFD) High Class assessment whilst inorganic nitrogen concentration achieves a WFD moderate status (indicating unfavourable condition for limiting phytoplankton and green macroalgae blooms and favouring seagrass vegetation).

The abundance of green macroalgae did not exceed that required for WFD Good ecological status based on EA surveys in 2011, 2012 and 2013 and is reported by EA in 2022 to achieve WFD Good status.

The harbour has strong tidal flows, and this is likely to limit the extent and abundance of macroalgae growth on some mudflat, especially where the harbour narrows into the tidal rivers and through the central harbour.

There are sluices in the river, physical structures which are likely to be significant physical barriers to lamprey migration and in the context of alternative migratory routes likely to have a greater direct impact on lampreys reaching spawning gravel beds.

It is acknowledged that there is little information available concerning the local Sea Lamprey population status and the representation presented any new evidence.

Therefore Natural England advise it is not reasonable, as has been suggested and based on a lack of evidence, to reach a conclusion that there would be a Likely Significant Effect on the River Avon SAC from the additional residential development proposed in the Local Plan, relative to the other harmful effects which are not related to proposals in the Local Plan.

Natural England advise that the Councils screening out of Sea Lamprey from further assessment is an appropriate conclusion in this plan level assessment.