

Hinkley C: a personal view by John May

“EDF had to disconnect all four reactors on Wednesday at its Paluel nuclear plant on Frances north coast after a “significant and unforeseeable” number of fish got stuck in the filter drums of the pumping station” ... “ the station draws in sea water for cooling.”

News article from January 2021

I have been an angler all my life and have fished the Bristol Channel by boat and from the shore between Portishead and Minehead since the early 60s. My home water is Bridgwater Bay where I first started boat fishing in 1980, soon after Hinkley B was commissioned. I retired 18 months ago after 6 years with the Devon and Severn Inshore Fisheries and Conservation Authority (DSIFCA) as a Marine Management Organisation representative for recreational angling. I have a very clear picture of how the Bristol Channel has evolved over this time.

It comes as a surprise to many that the brown waters of the Bristol Channel are designated “a special place that supports a huge array of marine and coastal wildlife” from above Slimbridge all the way down to the unique marine protected areas around Lundy. It provides a highway for migrating fish and bird life into great rivers like the Severn, Wye, Usk, Avon, Brue and others. I have fished them all and have membership to several fishing and wildlife organisations. Millions of pounds and volunteer hours are invested in projects that have been completed, planned or are in progress, to support and improve the environment. Projects to support shad, salmon, elvers, and bird migrations, recently joined by projects for the restoration of sturgeon. The Bristol Channel attracts the interest of visitors from all over the country.

The Severn has one of the most diverse estuarine fish faunas in the UK. Some species spend their entire life in the estuary. Others use the estuary for certain critical parts of their life cycle and the estuary is recognised as a nursery area for a wide range of species. This fish assemblage is protected in UK law as part of the Severn Estuary Special Area of Conservation (SAC). Apart from the migration of fish that enter the rivers and have some legal protection, we have other vitally important annual migrations of sea fish (spratt, herring, whiting, codling etc) that come to breed or grow but have no such protection. All of these migrating fish are key parts of the food chain attracting other species (cod, bass etc). The survivors are the future stock. It is a fine balance that I believe will be greatly affected by HPC. The channel waters are already under pressure with pollution, plastics etc from surrounding big populations of major cities.

Now we come to Hinkley Point C (HPC) - much larger than Hinkley Point B - it will take far more water, nearly five times more, around 3,500,000,000 gallons a day of seawater, as cooling for the power station. With that comes the increased pressure on the marine environment. The kill figures are based on the volume of water it uses and historic records of the HPB kill. The cooling water intakes for HPC are now uniquely located 3 kms offshore, compared with 400 metres currently for HPB. HPC, unlike HPB, will recycle the debris and fish (dead, wounded or alive) straight back into the sea via a shorter tunnel. HPB historically took it all to landfill. HPC is efficiently designed to make a saving on operational costs over the 70 year life of the power station, by returning the debris and dead fish to the sea. But in doing so it conveniently creates “an out of site out of mind” situation whereby a visual physical check had previously been available when the “waste” was there to be seen!

I have followed the Hinkley saga since 2012 when I took the chair at an open meeting hosted by my club, Burnham Boat Anglers, for EDF to give a presentation on their proposed scheme for HPC. We were told their intention to use an Acoustic Fish Deterrent (AFD) on each of the intakes would prevent the majority (circa 75%) of fish from entering the system. EDF said that the newly designed Low Velocity Inlet heads (LVIs) together with the Fish Recovery and Return system (FRR) would give protection to those fish that bypassed the AFD and entered the system. The meeting challenged the effectiveness of the AFD and the survival of fish going through the system, which resulted in a reluctant admission that the system was still “work in progress” and only the most robust of fish would survive the ordeal! This set our alarm bells ringing on day one.

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Shortly after this, in 2013, EDF applied for and were given a conditional permit by the EA to extract sea water. In order to get this permit, EDF had to satisfy the EA that the AFD and FRR performed so that it had complied with their requirements to protect the marine environment.

Seven years later, in 2019 when construction of the power station was well underway, EDF applied for the removal of the AFD because of "Health and Safety" concerns. They claimed that accessing the AFDs for maintenance "in the harsh environment of the Bristol Channel" was unsafe. They claimed, and still do, that the LVIs and FRR system together would still achieve or exceed the same standard (despite originally claiming that the AFDs prevented 75% of fish entering the system!) It has now come to light, from another document by CEFAS, that without the AFD the effectiveness of the LVIs will be completely negated. This will, in effect mean that 100% of the fish that approach the inlets will be taken in - which equates to four times as many as in their original scheme!

The EA, after meetings with EDF, unsurprisingly gave notice that the reduced scheme did not meet the required standard and they were about to issue a refusal for the revised permit. EDF quickly responded by lodging a formal appeal to the Planning Inspectorate (PINS) complaining about the length of time the EA were taking and the impending refusal. This reaction prevents the EA from formalising their refusal and publicising the reasons, so we do not know the details. Apparently, the EA cannot now be contacted directly for discussion on this subject due to the appeal process. Natural Resources Wales (NRW) are now involved and have been asking questions about the situation, but there is little public information available until the hearing. Whatever the result of the PINS appeal, the decision of the planning inspector will be final.

The technical papers on HPC run into thousands of pages that include many references to can/can't/will/won't, proven/unproven, unknown, estimated and "needs more investigation" qualifications - showing how weak and variable some of the "evidence" is. How can such evidence be considered in the context of taking a "precautionary approach" (which is Government policy) to protect the Severn Estuary and Bristol Channel?

To me, as I get to understand the process more, it is obvious that EDF/CEFAS are more intent on bullying their way towards compensation rather than complying with their responsibility to protect the Bristol Channel. The kill, the cruelty and the ensuing effects on the environment are too big to be bought off by financial compensation -if that is where it is heading. They claim that they are "fish friendly" so they should be held to it - lets have it - no more cover ups.

EDF are spending circa £4.5 million a year with CEFAS for their support and I would assume that this would greatly exceed the resources the EA has available. Surely there is a conflict of interest here where we are looking for a precautionary outcome and CEFAS are supporting commercial interests? The EA are tasked with the precautionary line which we should not cross. CEFAS cannot claim to be unbiased in this case.

I do completely trust the substantial published comments made by DSIFCA during the consultations. These fisheries scientists are completely unbiased, very knowledgeable and make reasonable comments, criticisms and recommendations on the consultation papers. They stress the need for acting cautiously because of the serious ramifications of getting it wrong. They have confirmed their strong support for the EAs intention not to issue the permit. They do not have the remit or the resources to directly challenge the bottomless financial pit of HPC.

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I also trust and acknowledge the information supplied by Peter Henderson of Pisces who has been officially monitoring the number of fish and crustaceans etc killed at HPB since it was commissioned in the 70s. Peter's predictions of the fish kill at HPC, based on HPB, are frighteningly high. He is a recognised international authority on environmental issues around nuclear power stations and was involved in giving advice to the U.S. who no longer allow direct cooling systems such as the one at HPC because of the kill. He was not involved with the published predictions of the HPC fish/crustacean kill, which he believes are greatly understated and he is greatly concerned with the long term consequences to the Bristol Channel.

HPC is unique in many ways as is the Bristol Channel. The length combined with the depth of the tunnels means that there is no other working power station to use as a direct comparison for the consequential damage to marine life. CEFAS fisheries scientists have used all sorts of theories and guesstimate figures to make a case that the impact of HPC on fisheries and the marine environment will be "insignificant" but as part of the EDF team that is what they are paid to do. (Like an accountant protecting his client?)

I am sure that if CEFAS were on the other side of the fence they would equally support our case.

Throughout the process, EDF have attempted to brainwash us with "Fake News". Coachloads of visitors to the site have been indoctrinated on a daily basis about the fish friendly processes and all of EDFs papers say the same - but friendly it most definitely is not. They do admit a kill but try to belittle it by claiming that it is insignificant and will be of no consequence to the marine environment?

There are still too many questions and contradiction for me, and many others, to have any confidence in what we are being told.

EDF claimed the AFD will stop 75% of fish from entering the system, now they say that they cannot design such a system and in any case H&S issues "in the harsh Bristol Channel waters" would not allow them to safely access and maintain them. Why have they changed their story?

They now claim that the LVIs and the FRR together will still do the job without the AFD. But another paper from CEFAS says that without AFD the LVIs will not function?

We are constantly told in their papers that Direct Cooling (taking water directly from the Bristol Channel) is "Best Available Technology (BAT)" but the actual words say "Can be best for estuarine and coastal sites provided that best practice in planning, design, mitigation and compensation are followed but there may remain cases where even with the application of best practice residual impacts would be unacceptable in these cases seawater cooling towers would be used". Surely this is where HPC without the benefits of the AFD will sit, being unable to fulfil the other criteria? The impact of water abstraction for cooling towers is rated moderate/low whereas the direct cooling is rated high? Less water taken means less fish killed. Other systems of hybrids options could have been considered more in the light of the failure of AFD design?

We are repeatedly told that the fish kill from HPC is insignificant (being less than the "standard" of 1% of the local population). CEFAS have used some estimated species populations spread across the whole of the Bristol Channel and Irish Sea to get below this threshold. This method is used to assess stock levels between differing "sea areas" for commercial stock levels – a calculation that is not appropriate for the Severn stock, which is a juvenile fish habitat, not a commercial fishing area. There are no trawlers operating in the area around HPC where much of the seabed is protected. Surely the appropriate calculations should be based on the local stock - the area around HPC? Minehead to Weston Super Mare would be more feasible, but the suspicion is that would not achieve the magic sub1% and put more restrictions on the HPC design.

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The population of young fish in the sheltered and protected Bristol Channel is a very important source of new stock into the heavily fished commercial waters of the Southern Irish Sea - another prime reason why young Bristol Channel fish should be protected.

If all the fish in the Irish Sea were killed would we compare that to the fish population in the atlantic and say that "it's less than 1% so it's insignificant"?

We are told that the "kill" is equivalent to one extra trawler - this again is misleading - there are no other trawlers working full time in the HPC area. In any case trawlers are regulated with minimum landing sizes, catch quotas, and closed seasons that manage stock levels etc. HPC is 24/7, 365 days a year for up to 70 years, indiscriminately killing anything that is brought into the tunnels from crabs, prawns, fry and fish of all types and sizes. Hugely damaging locally and completely irrelevant to adding one trawler to a fleet operating in other parts of the country!

Similarly, the understated kill tonnage for HPC is quoted against the total commercial catch for the UK - obviously another tiny % - but again what relevance is that to the local stocks around HPC?

There is a real concern around the weakness or absence of up to date evidence on the effects on truly local stocks.

Our "common sense" observations and questions are:

HPC inlets are unique because of the 10 metre rise and fall of the tide and their proximity to the Steart mudflats and Brean and Berrow beaches. This means that at low water the species of fish etc, that are normally more often found in the shallow water along the beach and mudflats, are pulled back to the now shallow water around the inlets where they are vulnerable. At high water, the species that are more often found in the deeper water are now around the inlets and are also vulnerable. The consequence is that HPC has an onerous responsibility to protect a greater spectrum of fish than most power stations.

Why did EDF, with their expertise and knowledge, include AFDs in their scheme but claim later that they were not immediately aware of the H&S risk? Under CDM regulations H&S risks are part of the design process? Why did they wait seven years before raising these issues?

Why did the EA allow it to happen? (We can see that the EA appear to be in favour of AFDs). There was a requirement for the AFDs and the FRS system to be proven - if there was any doubt, why was it not stipulated that they should be proven by design at the beginning of the process before issuing the conditional permit or even allowing construction to start?

The revised scheme relies on the LVIs and FRS system, but another CEFAS paper says quite categorically that LVI benefits would be negated if they were installed without AFDs in heavily sedimented water. So, no protection whatsoever is given at the intakes!

Fish mortality in the tunnels. EDF claim the low villosity intakes and fish return system are "fish friendly". They are not. As anglers we are well aware of the need to handle fish carefully and take great care when returning them to the sea. No matter what, if any, benefit is given as they enter the heads, the fish together with thousands of tonnes of water and debris immediately drop 35 metres down into the top of a tunnel. They are then pushed three kilometres in turbulent water back to land and up into huge collection reservoirs. This journey is the killer. The rapid pressure changes and the abrasion on the concrete walls of the tunnels will tear fish apart, break their backs and/or literally skin parts of their bodies.

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Injured and traumatised fish as we know rarely survive if they are unable to swim properly - they drown and are predated on. HPC has a longer tunnel system than most, so the carnage will be more than a typical site. I understand that the EA believe that the kill will be higher than EDF/CEFAS claim and more of a threat to local stocks. The EA have reports on typical injuries to fish in power stations but bear in mind that HPC has longer and deeper tunnels with higher than average flows.

We know from our catches that individual fish in the area will vary up to 16kgs each, with the occasional larger fish. Our members have seen occasional seals in HPB and protected harbour porpoise use the Bristol Channel. Skate, conger eels and smoothound are commonly found in numbers around the inlet area but not all are included in the survival statistics. Surely these larger fish, especially the skate because of its shape, will be at great physical risk in the system? The survival charts acknowledge a 100% kill for herring and sprat, which must also apply to whiting and cod for the same reasons. Flounder also have a high mortality at 50%. Smoothound and Bass are also present in numbers in this area.

From the reservoirs the water enters the cooling system. Before entering the cooling pipes the water passes through a set of bars spaced 50mm apart to catch larger debris, plastic, fish (dead or alive) and then on to 5mm revolving mesh screens with "shelves" that lift finer debris and any remaining fish "dead or alive" up into gutters that take them to the fish return tunnel and back to the sea. It is on the screens after the bars that prawns, crabs and small fish are trapped by the force of the water against the screens and killed (probably the point which blocked the flow in the French power station?) Any other smaller organisms that pass the mesh perish when the water temperature rises as it provides the cooling function.

It is not clear how or when the larger fish (dead or alive) are recovered from the 50mm bars. There is reference for an unproven system that mechanically rakes the debris/fish from the bars when they are dead or weakened and somehow gets them into the return channels. We are potentially looking at large numbers of conger eels, rays and smoothounds all different shapes and sizes and very lively if they are alive and uninjured. It does not look good.

The fish kill on some of these type of direct cooling plants have led to major pollutions and major changes in the local ecosystem downstream of the outlets. Seals are attracted which puts more pressure on local stocks and in extreme cases major pollutions have occurred.

The question that has been repeatedly asked through the consultations, and has yet to be answered, is how do EDF and CEFAS propose to measure and monitor the actual kill against the predictions made by EDF and CEFAS. What can be measured against what? What is plan B if the results fall short? Who will be held responsible if their assumptions prove to be wrong? It is difficult to even guess how this can be substantiated with reasonable certainty, but it is a vital part of the process. I hope that this will not be something else that has not been sorted in advance, like the AFD.

The huge issue at the end of the day is that we will not know if the chosen process works efficiently until sometime after hpc is up and running by which time it is too late to change. You cannot shut it down so we must be cautious with every part of the process leaving a precautionary buffer. We must have a back up plan and a commitment for ongoing improvement with new technology as you would expect with any environmental damage caused by a power station.

Whatever is done about monitoring the fish kill, it should be carried out by an independent organisation so we can have confidence in getting the truth.

Environmental NGOs say that they are completely bemused about how EDF continues construction of this power plant without hesitation or complying with environmental regulations - which every other developer is expected to do on this internationally important estuary.