SEVERN TIDAL POWER: PHASE ONE CONSULTATION

We are responding on behalf of the Salmon and Trout Association and the Atlantic Salmon Trust to this consultation

The Salmon & Trout Association (S&TA), which was awarded charitable status due to our work concerning fish stock management and aquatic conservation, has over 100,000 individual and club members. We represent the public interest over issues relevant to the management and conservation of fish, water, the aquatic environment and all its dependent species.

Established in 1967, the Atlantic Salmon Trust (AST) is a UK-wide organisation which champions the wild salmon and sea trout. It does not represent any other interests or body, only the fish themselves. It:

a. Works for the conservation and improvement of wild salmon and sea trout stocks to a level which allows sustainable exploitation.
b. Conducts and supports marine and freshwater research.
c. Gives practical advice on the management of fisheries and rivers.
d. Gives independent research based advice to governments, international and national authorities and to commercial enterprises.
e. Coordinates activities with other conservation, environmental, fishery, heritage and wildlife agencies and organisations.
f. Holds and supports seminars and workshops to investigate specific issues.
g. Publishes high quality reports and booklets to inform and educate the public.

General Comments

Both our organisations support the UK's targets to reduce greenhouse gas emissions and the Government's ambitions to tackle climate change and increase the proportion of overall energy generated from renewable sources. Climate change threatens the continuing viability of many fish species in the southern parts of the U.K., and it is imperative that action is taken, at the global and national level, to reduce out puts of

Fishmongers' Hall, London Bridge, London EC4R 9EL
T: 020 7283 5838 | F: 020 7626 5137 | E: hq@salmon-trout.org | W: www.salmon-trout.org

Patron: HRH The Prince of Wales | President: The Duke of Northumberland
The Salmon & Trout Association Limited is a company registered in England and Wales.
Registered No. 5051506 | Charity No. 1123285

carbon. We share therefore the sense of urgency in deploying and developing solutions to move the UK towards a low carbon society.

With others, we believe securing widespread public support for the transition to a low carbon economy is critical. This will be helped considerably if large-scale renewable projects are seen to respect the natural and cultural environment.

Wave and tidal power are likely to be essential part of moving to a zero carbon power sector. We therefore support the exploration of how to harness the considerable tidal power resource of the Severn estuary, to contribute to emissions reductions beyond 2020. We believe the Severn Feasibility Study is a golden opportunity to crack the problem of how to harness the Severn's tides in a sustainable way.

However, the importance of sites - such as the Severn Estuary - in allowing wildlife the space and diversity of habitats to adapt to climate change should be acknowledged.

With over 100 species of fish and vast marshes and mudflats used by 69,000 birds each winter, the Severn Estuary is a thriving European wildlife site. The Severn Tidal Power Feasibility Study should seek to identify a project which maximises the generation of renewable energy, while minimising damage to the Severn Estuary's internationally important wildlife, and natural and historic environment, at an affordable cost to tax-payers and consumers. We do not consider that the current exercise is is capable of doing this.

The AST and the S&TA are both members of the consortium of NGO's that commissioned Atkins Engineering to review the Interim Options Analysis Report. We agree with Atkins' assessment of the flaws in this process; in particular, we agree that 'the attempt to short list options prior to an SEA seems illogical and may fail a legal test'. Our reasons for taking this view are given below, in We support all the recommendation in the Atkins' report

In the light of the Atkins report,and of our own assessment of the proposed SEA process in relation to diadromous fish, which is set out below, we consider that the Government should:

Fishmongers' Hall, London Bridge, London EC4R 9EL
T: 020 7283 5838 | F: 020 7626 5137 | E: hq@salmon-trout.org | W: www.salmon-trout.org

Patron: HRH The Prince of Wales | President: The Duke of Northumberland
The Salmon & Trout Association Limited is a company registered in England and Wales.
Registered No. 5051506 | Charity No. 1123285

- at this stage only exclude from the SEA options that are clearly unreasonable;
- ensure that adequate information on the environmental impacts of the various options, and of the likely effectiveness of possible mitigation measures, is available **before** decisions are taken on the different options. If necessary field studies and new research must be undertaken, even if this delays the assessment process.
- re-examine the cost assumptions to remove the current bias in favour of very large projects and to enable fair comparisons can be made with other renewable energy options;
- examine the environmental impacts of constructing the different options as part of the SEA;
- conduct further work on turbine designs to assess the environmental and power generation advantages and disadvantages of two-way generation and ways of reducing harm to fish
- provide the resources to ensure that innovative technologies are properly considered alongside more conventional ones in the assessment process.

Diadromous Fish.

As NGOs concerned with the conservation of, in particular, salmon and trout (including sea trout), and with an interest in all species of migratory fish, we have focused our response on the implications of any STP scheme for these.

The Topic paper on Migratory and Estuarine Fish makes it clear that there is a lack of basic information about key aspects of the ecology and behaviour of diadromous fish species (including routes and depth of passage, tidal transport, swim speed, transit time, residence time, diurnal timing, seasonality, migratory cue, homing behaviour and stock

status) found in the Severn Estuary. It is clear that the further work recommended for phase 2 of the SEA will do little to fill these gaps, since in the time available it will not be possible to undertake field work. The Topic paper acknowledges that field studies 'will be essential before any STP option can be taken forward', yet the Government is proposing to take decisions on the short list and, at the end of phase 2, on its preferred option before this essential research is undertaken and without the necessary information on the impact of its decisions on a number of protected fish species.

In these circumstances, it is difficult to see how any of the options can be regarded as reasonable alternatives so far as diadromous fish are concerned. Equally, it is not possible in the current state of knowledge to judge the effectiveness of any of the possible mitigation measures suggested in the topic paper (leaving aside the point that we cannot at present know the scale of mitigation that might be required.)

In our view, the following work, including where necessary field work, needs to be undertaken **before** decisions on any STP options are taken:

- **Studies of fish migration and movement within the estuary**. Migration routes and timing for the different diadromous species are not known. Once this information is available, it may be possible to reduce the adverse impact of some options by the careful siting of turbines and sluices and by modifying operational parameters to take account of migration patterns.

  For salmon and shad the issue is complicated by the extent of movement within the estuary. Salmon, in particular, move extensively within the estuary before definitively returning to their natal rivers; salmon from the Wye and Usk are taken in the putcher ranks that operate upstream of all the possible barrages. Even if salmon passed unharmed through a barrage going upstream, there is a considerable risk that they would be damaged by turbines as they dropped back downstream, and it is not known how often a salmon might attempt to pass a barrier. We also do not know whether salmon parr and pre-smolts make use of intertidal habitat (there is evidence from other rivers of considerable movement of parr in the Autumn) and might therefore be adversely affected by a barrage.

The Centre for Environmental, Fisheries and Aquaculture Science (CEFAS) is a world leader in the use of acoustic tags to track salmon within estuaries, and is currently carrying out tracking studies in the estuaries of the Tyne and the Tees. The Canadian authorities also have extensive experience of a tracking salmon acoustically in the Bay of Fundy, and this technology has also been used for eels. The technology therefore exists to carry out the necessary tracking studies in the Severn, although employing them for all diadromous species concerned in such a large estuary would be challenging.

- **Studies of the migration cues** for the different diadromous species and of the potential impact on them of the various options. This would need to take into account the possible hydromorphological effects of each of the options, since these would be likely to cause significant changes in flow patterns and temperature regimes and thus in migration cues. Reduced flows and weaker tidal effects could have a disproportionate effect on elvers, which are dependent on tidal currents to negotiate the estuary.

- **Studies of turbine design and locations to minimise their effect on fish** (the term 'fish-friendly is a misnomer in relation to turbines, but it may be possible to make them less unfriendly).Such studies will need to encompass all relevant diadromous species at all relevant life-stages. Work in North America has shown that turbines are particularly damaging to emigrating silver eels. The topic paper summarises the impacts, both direct and indirect, that turbines can have on fish , including increased predation, and these all need to be covered by this work. The work also needs to examine the potential effects of sluices, which the Topic paper acknowledges could have adverse effects on fish passing through.

Although most of the designs envisage power generation on ebb tides only, the possibility of operating turbines on an incoming flood tide needs to be considered as a means of reducing impacts on fish moving downstream. This could significantly reduce losses of smolts, juvenile shad and silver eels at peak migration periods. However, where designs are intended to operate on both ebb and flood tides, such

as a tidal reef, the effects on salmon, sea trout and shad moving up and down the estuary (see above) need to be considered.

The studies we suggest could help mitigate the effect of an STP scheme on diadromous fish. Some of the other studies proposed in the Topic paper, such as the development of life history models, would help inform an eventual decision. However, in our view many of the mitigation/compensation ideas suggested in the paper would not be effective. In particular, we do not consider that attempting to create new habitats outside the Severn estuary, translocate species or designate new SACs could compensate for the loss of a considerable number of genetically distinct salmon populations or work for most other species (although trapping and transport of elvers and adults might work for eels). For salmon the creation of new SACs would add very little to existing levels of protection, since conservation limits, which the Environment Agency is working to achieve, have been set for all significant salmon rivers and these have been reinforced by the requirements of the Water Framework Directive.

Our responses to individual questions in the consultation paper are annexed.

Yours sincerely

Paul Knight	Ivor Llewelyn
Chief Executive,	Deputy Director (England & Wales)
Salmon and Trout Association	Atlantic Salmon Trust

Fishmongers' Hall, London Bridge, London EC4R 9EL
T: 020 7283 5838 | F: 020 7626 5137 | E: hq@salmon-trout.org | W: www.salmon-trout.org

Patron: HRH The Prince of Wales | President: The Duke of Northumberland
The Salmon & Trout Association Limited is a company registered in England and Wales.
Registered No. 5051506 | Charity No. 1123285

ANNEX

COMMENTS ON SPECIFIC QUESTIONS RAISED IN THE CONSULTATION

Overarching questions

Is the feasibility study taking the right issues into account?

On the basis of the information currently available we consider that key ecological receptors have been identified. We also broadly agree with the SEA objectives. However, we believe that the current SEA process is fundamentally flawed.

Have we given due weighting to the different benefits and impacts under consideration in our analysis?

No. We consider that the feasibility study should have looked at how to give environmental constraints equal consideration alongside economic factors, energy generation potential and technological advancement in the design of any solution to harness the power of the estuary.

Having rejected this approach in favour of tendering for proposals, we believe that the Government has adopted an assessment framework to appraise options that is seriously flawed.

Application of the current assessment framework means that only schemes which meet specified economic and technical criteria have been short-listed, irrespective of their socio-environmental impacts. In contrast, those projects that take socio-environmental considerations into account in innovative designs appear to have been rejected on cost

Fishmongers' Hall, London Bridge, London EC4R 9EL
T: 020 7283 5838 | F: 020 7626 5137 | E: hq@salmon-trout.org | W: www.salmon-trout.org

Patron: HRH The Prince of Wales | President: The Duke of Northumberland
The Salmon & Trout Association Limited is a company registered in England and Wales.
Registered No. 5051506 | Charity No. 1123285

grounds. In our view, this approach is irrational and contrary to public contrast in that it could lead to the rejection of a practicable alternative on cost grounds alone.

Do you think that it is better to wait for new and perhaps less environmentally damaging technologies to be developed, or to move ahead more quickly with available proposals?

In principle, yes. Any project which goes ahead must maximise the generation of renewable energy, while minimising damage to the Severn Estuary's internationally important wildlife, and natural and historic environment, at an affordable cost to tax-payers and consumers. It is more important to identify the best way forward than to move ahead quickly, bearing in mind that power from ant STP scheme is not needed to reach the Governments target for renewable energy generation in 2020.

Short-listing process

Do you agree with the factors that have been used to determine the short-list for further study?

No, for the reasons given in the response to the second question above. We consider that it is premature to short-list any proposals before a comprehensive assessment of the environmental implications of all reasonable options has been undertaken and the additional work on costs, turbine technologies etc, identified in the Atkins review of the Interim Options Appraisal Report, has been carried out.

Fishmongers' Hall, London Bridge, London EC4R 9EL
T: 020 7283 5838 | F: 020 7626 5137 | E: hq@salmon-trout.org | W: www.salmon-trout.org

Patron: HRH The Prince of Wales | President: The Duke of Northumberland
The Salmon & Trout Association Limited is a company registered in England and Wales.
Registered No. 5051506 | Charity No. 1123285