

# science summary



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## Science Project: Flow protection criteria for adult salmon – phase 3 case studies

Summary SC040040/SS

The Environment Agency has a duty to balance the requirements of water abstractors with those of the environment. In the case of salmon, flow can affect salmon stocks by varying the timing of their upstream migration, changing exploitation rates in the fisheries and altering non-fishery related losses to the spawning stock. A reduction in flow can cause delay of fish entering the fishery as well as additional mortality reducing the spawning stock.

Science Project SC010016/SR, Flow protection criteria for adult salmonids, (phase II) (Greest et al., 2005) used data from telemetry studies and fish counters to develop a statistical model to assess the potential impact of abstractions and water resource schemes on adult salmon entering freshwater. The model quantifies the impact in terms of delay and mortality at tidal limit as well as the level of uncertainty. The results from the model simulations could be used in the decision making process to evaluate the impact of an altered flow regime on the number of salmon available to the fishery and for spawning.

The main aim of phase III of the project was to further develop the application to management by testing the model in case studies, and exploring how the methodology may be implemented in the Environment Agency.

This phase of the work demonstrated that the model can successfully predict the impacts of various river flow scenarios upon rates of loss of salmon as they ascend estuaries towards freshwater.

There is good potential for application of the model within the Environment Agency. In Catchment Abstraction Management Systems (CAMS) it could be used alongside the existing ecological assessments to help determine River Flow Objectives. The methodology may be useful for Habitats Directive Review of Consents on some of the sites where assessments are still to be undertaken. The model could also be used in reviewing individual licence applications.

Using the outputs from these models in conjunction with river-specific Conservation Limits for salmon can provide guidelines as to what levels of fish loss are sustainable and ultimately whether a given abstraction scenario is likely to result in a river failing its salmonid Spawning Targets or Good Ecological Status under Water Framework Directive.

The model needs further refinement in order to make it sufficiently flexible to be used on rivers with fish counter data only or on rivers where there are no data

This report should be read in conjunction with SC010016/SR

This Summary relates to information from Science Project SC040040 reported in detail in the following output:-

**Science Report SC040040/SR**  
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