



Home Office

NON-TECHNICAL SUMMARY

Factors affecting fish populations

Project duration

Years 5

Months 0

Project purpose

- (a) Basic research
- (b) Translational or applied research with one of the following aims:
 - (ii) Assessment, detection, regulation or modification of physiological conditions in man, animals or plants.
- (d) Protection of the natural environment in the interests of the health or welfare of man or animals.

Key words

environmental factors, anthropogenic factors, fish, marine, freshwater

Retrospective assessment

| The Secretary of State has determined that a retrospective assessment of this licence is not required.

Objectives and benefits

Description of the project's objectives, for example the scientific unknowns or clinical or scientific needs it's addressing.

What is the aim of this project?

This project is designed to generate reliable and objective scientific evidence on the impact of selected environmental factors affecting fish populations in support of specialist advice provided to stakeholders,

national and international governments and other international organisations on the conservation and management of fish stocks. In particular, the project will examine how man-made activities within the aquatic environment and modifications to the freshwater and marine environment may affect the ability of migratory fish to move between their feeding and spawning grounds and to provide advice to government departments on mitigation measures. Specifically, the project will focus on renewable hydropower schemes and construction activity within rivers, estuaries and coastal waters. The project will use an integrated scientific approach with field based studies and physiological measurements to examine how changes to the environment affect wild fish at both the individual and population levels.

Potential benefits likely to derive from the project, for example how science might be advanced or how humans, animals or the environment might benefit - these could be short-term benefits within the duration of the project or long-term benefits that accrue after the project has finished.

What are the potential benefits that will derive from this project?

Information on all aspects of fish biology and ecology will permit better advice to Defra Policy customers, and to the Environment Agency (EA), International Council for the Exploration of the Sea (ICES) and North Atlantic Salmon Conservation Organisation (NASCO) on the conservation and management of fish stocks. The work will also support the Water Framework Directive, the Salmon and Freshwater Fisheries Act 1975, the Eel Regulations 2009 and the Habitats and Birds Directives of the European Union, applied through the Conservation of Habitats and Species Regulations 2010 (SI No. 2010/490), commonly known as the Habitats Regulations.

Species and numbers of animals expected to be used

What types and approximate numbers of animals will you use over the course of this project?

There is no alternative to the use of living animals, as the principal aim of the work is to describe the behaviour of fish in relation to changes in their natural aquatic environment in order to conserve and manage populations. Consequently, a range of fish species (including salmon, sea trout, European eels, coarse fish, lamprey, shad and smelt) will be studied over the course of 5 years in order to provide relevant and meaningful data on which decisions are made. In developing the project, advice has been obtained from a statistician experienced in animal research, regarding animal numbers and design. The numbers used will range from 1000 to 50 000, depending on the procedure utilised. For example, large number of fish will be used solely for sampling and tagging procedures, with mild and moderate levels of severity.

Predicted harms

Typical procedures done to animals, for example injections or surgical procedures, including duration of the experiment and number of procedures.

In the context of what you propose to do to the animals, what are the expected adverse effects and the likely/expected level of severity? What will happen to the animals at the end?

The behaviour of fish in the wild will be studied using a range of telemetry techniques which involve the use of electronic transmitters and remote sensing devices. Most procedures will involve mild and moderate levels of severity, apart from terminal sampling. However, it will be ensured that smaller numbers of fish are used for those procedures when possible. At the end of each procedure, before fish are released to the wild, they will be assessed by appropriately trained and qualified individuals to ensure that the fish are fit and their welfare is protected. Alternatively, they will be humanely killed.

Application of the three Rs

1. Replacement

State why you need to use animals and why you cannot use non-animal alternatives.

The principal aim of the work is to describe the behaviour of fish in relation to changes in their natural aquatic environment in order to conserve and manage populations. Therefore, there is no alternative to the use of living animals.

2. Reduction

Explain how you will assure the use of minimum numbers of animals.

All experimental work will utilise the published literature and previous experience by the Project Licence holder and colleagues who undertake similar work to ensure that the minimum number of animals are used that will permit a robust statistical and meaningful analyses of the results. All experimental work will be discussed and agreed with a professional Statistician, who will provide statistical support to all aspects of the research, from designing the experimental approach to conducting and reporting the analyses

3. Refinement

Explain the choice of species and why the animal model(s) you will use are the most refined, having regard to the objectives. Explain the general measures you will take to minimise welfare costs (harms) to the animals.

The purpose of the work is to provide advice on the conservation and management of fish stocks. Therefore, a range of fish species need to be studied to produce adequate data on the impacts on fish populations from a wide range of environmental and man-made changes to the aquatic environment. The methods chosen are based on previous experience and research and will provide evidence that will form the basis of suitable advice to Government on the factors affecting fish populations and recommendations for suitable mitigation. Where fish undergo a procedure and recovery, they will be monitored for a suitable period of time in order to assess any adverse impacts and ensure a minimum of suffering.