Home Office

NON-TECHNICAL SUMMARY

Assessment of fish stocks and impacts of environmental and anthropogenic factors

Project duration

Years **5**
Months **0**

Project purpose

- (d) Protection of the natural environment in the interests of the health or welfare of man or animals.
- (e) Research aimed at preserving the species of animal subjected to regulated procedures as part of the programme of work.

Key words

Environmental, anthropogenic, fish, freshwater, diadromous

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?

To generate reliable and objective scientific evidence on fish populations, their ecology and the impact of selected environmental and anthropogenic (man-made) factors. This will support specialist advice

provided to stakeholders, national and international governments and other international organisations on the conservation and management of fish stocks. Primarily, the work will focus on diadromous fish species that may use freshwater, estuarine and marine habitats during their life cycle, but will also include exclusively freshwater, marine and non-native fish species.

Effective management of freshwater, diadromous and marine fish stocks and the fisheries dependent upon them requires reliable information on the status of stocks, patterns and levels of exploitation and on a range of factors, both natural and made-made, which can impact on fish at different times in their life-cycle. Furthermore, research is required to be carried out in order to understand the abundance, distribution, behaviour, movement and diet of these fish and stocks, and the effects of man's influence on these populations through impacts on the aquatic environment (e.g. climate change, artificial night light, water abstraction fish stocking and introductions) to both manage and conserve these species.

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 ecology including their abundance, distribution and migrations under a changing environment, and the impact of introduced fish species, will permit better advice to Government departments and agencies, the 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 information will also contribute to the development of methods for assessing salmon, sea trout and European eel stocks and improve management of fisheries.

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?

This licence will use fish. There is no alternative to the use of living animals, as the principal aim of the work is to describe the ecology and behaviour of fish in relation to changes in their aquatic environment 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 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 between protocols from 500 to 30 000, depending on the procedure used. For example, large numbers of fish will be used solely for sampling and tagging procedures, with mild 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 procedures will involve mild or 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, if fish are to be 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 ecology and behaviour of fish in relation to changes in their aquatic environment to conserve and manage populations. Therefore, there is no alternative to the use of living animals. However, where appropriate, environmental DNA sampling is being used as a non-invasive means to sample waterbodies to determine the presence or absence of fish species. This is a developing tool and has further potential to replace fish capture in some circumstances.

2. Reduction

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

All experimental work will use the peer-reviewed scientific literature, discussions with professional statisticians and 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. Statisticians 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.