Manual for Provision of Upstream Migration Facilities for Eel and Elver

Summary SC020075/S2

This document is out of date and was withdrawn 09/06/2016.

The overall aim of this study was to produce design criteria and best practice designs for eel and elver passes. A Technical Report (Solomon and Beach 2004) undertook a review of relevant aspects of eel biology and existing passage facilities for eels and elvers. This manual summarises the earlier Technical Report and develops design criteria for passage facilities in a range of situations.

Types of obstruction where passage facilities might be required include tidal barrages, tidal flaps, mill weirs, gauging weirs, amenity barrages and weirs, navigation weirs, dams for reservoirs or HEP, diversion dams or weirs, water intake weirs and fish counting structures.

Essential first steps of catchment-wide and site specific surveys and evaluation are described and specified.

The manual describes fundamental approaches to providing upstream passage facilities as an introduction to the analysis of existing installations. These are channel passes, pass-traps, pumped-supply passes, pipe passes, lifts and locks, easements, and removal of the structure. The fundamental approaches to protection of downstream migrants are also discussed.

Biological criteria for design of passage facilities are explored. These include the seasonal timing of migration, effects of water temperature, river discharge, light, tide, lunar cycle and time of day on migratory activity, climbing ability, dispersion and rate of upstream migration, vulnerability to predation, sizes of fish involved, and swimming ability.

Based upon the development of biological criteria, a series of detailed design considerations are presented. These include siting of facilities, facilities based on substrates, facilities based on easements and “natural” channels, pipe passes, lifts and locks, upstream outlet arrangements, monitoring facilities, trap and transport, passage of eels through passes designed for other species, attraction flows, maintenance, health and safety considerations, and protection of downstream migrants.

An analysis of a number of existing installations is presented, describing the facilities and reviewing factors that aided design and installation, and good and limiting features of design and installation.

A series of conceptual designs are presented for various situations including low-head and high head structures, gauging stations, tidal barriers and culverts.

Requirements for further investigation are identified.

A list is provided of suppliers of eel pass modules and materials used for their construction.

The manual will mainly be of use to Agency fisheries staff and others concerned with providing passage for fish around obstructions in rivers.

Reference:
Solomon, D.J. & Beach, M.H. (2004) Fish Pass Design for Eel and Elver. Environment Agency R&D Technical Report W2-070/TR1
ISBN 184432267X

This Summary relates to information from Science Project SC020075 reported in detail in the following outputs:-

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This project was funded by our Science Group, which provides scientific knowledge, tools and techniques to enable us to protect and manage the environment as effectively as possible.

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