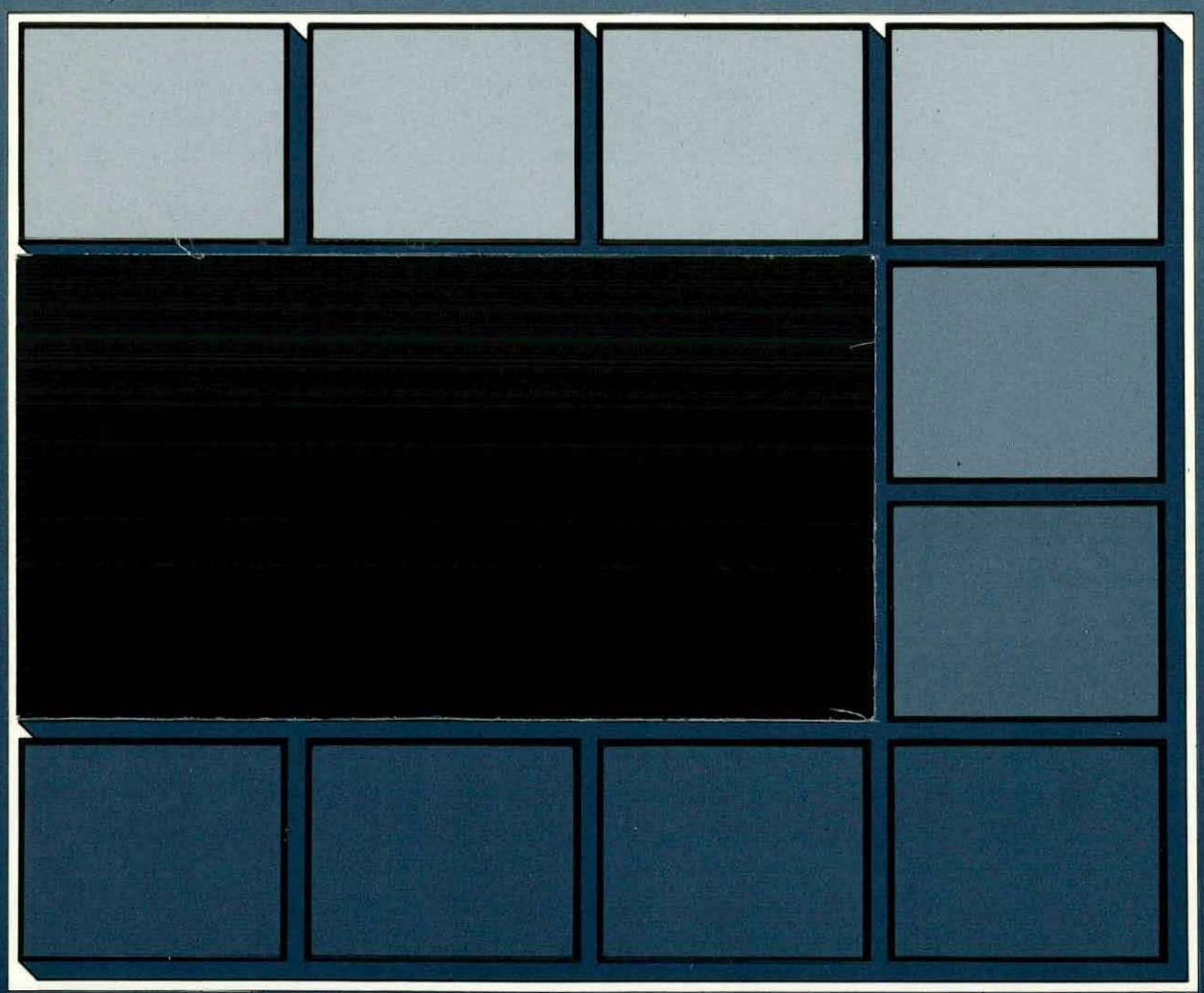
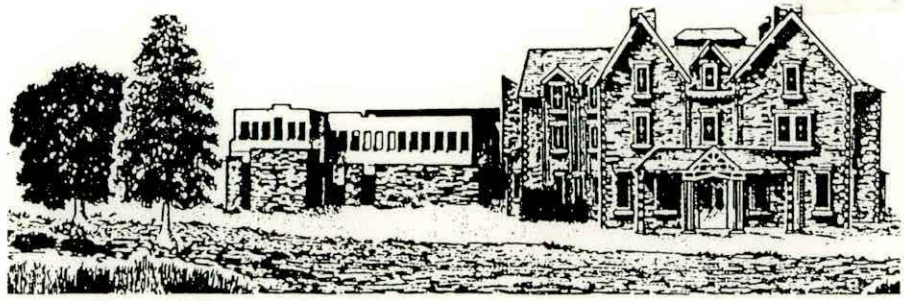
FRESHWATER
BIOLOGICAL
ASSOCIATION





The **Freshwater Biological Association** is the leading scientific research organisation for the freshwater environment in the United Kingdom. It was founded in 1929 as an independent organisation to pursue fundamental research into all aspects of freshwater biology and chemistry. The FBA has two main laboratories. The headquarters is at Windermere in the Lake District and the River Laboratory is in the south of England. A small unit has recently been established near Huntingdon to study slow-flowing eastern rivers.

The FBA's primary source of funding is the Natural Environment Research Council but, in addition, the Association receives substantial support from the Department of the Environment and the Ministry of Agriculture, Fisheries and Food who commission research projects relevant to their interests and responsibilities. It also carries out contracts for consulting engineers, water authorities, private industry, conservation bodies, local government and international agencies.

The staff includes scientists who are acknowledged experts in all the major disciplines. They regularly attend international meetings and visit laboratories in other countries to extend their experience and keep up to date with new developments. Their own knowledge is backed by a library housing an unrivalled collection of books and periodicals on freshwater science and with access to computerized information retrieval services. A range of experimental facilities is available to carry out trials under controlled conditions. These resources can be made available to help solve many types of practical problems. Moreover, as a member of the Terrestrial and Freshwater Sciences Directorate of the Natural Environment Research Council, the FBA is able to link up with other institutes to provide a wider range of environmental expertise as the occasion demands. Thus, the FBA is in a unique position to bring relevant expertise together for problems involving several disciplines.

Recent contracts have involved a wide variety of topics including biological monitoring, environmental impact assessment, fisheries problems, salmon counting, ecological effects of reservoirs and other engineering works, control of water weeds, control of insect pests and effects of chemicals on plants and animals.

Windermere Laboratory
The Ferry House
Ambleside
Cumbria LA22 0LP
Telephone: 09662-2468
Telex: 8950511 ONEONE G
REF 16173001
Facsimile: 09662-6914

River Laboratory
East Stoke
Wareham
Dorset BH20 6BB
Telephone: 0929-462314
Telex: 8950511 ONEONE G
REF 16174001
Facsimile: 0929-462180

FRESHWATER BIOLOGICAL ASSOCIATION
Teesdale Unit, c/o Northumbrian Water, Lartington Treatment Works,
Lartington, Barnard Castle, Co. Durham DL12 9DW

Project leader: D.T. Crisp
Report date: March 1989
Report to: Ministry of Agriculture, Fisheries & Food
TFS Project No: T04009-5

WIT/T04009-5/3

The ecology of young stages of salmonid fish and the implications for practical river management

Report for the period 20 September 1988 to 31 March 1989

D.T. Crisp

The Freshwater Biological Association is part of the Terrestrial and Freshwater Sciences Directorate of the Natural Environment Research Council.

The ecology of young stages of salmonid fish and the implications for practical river management - brief account of progress to March 1989.

1. Publication of data:

Considerable progress in writing-up and publication has been made. See appended list for details, please.

2. Emergence experiments:

Discussion with customer representatives in autumn 1988 led to a decision not to pursue these experiments further. The results have been written up as a report to customers. The apparatus will be used in 1989 by Newcastle University Civil Engineering Dept. in experiments not directly related to the present contract.

3. Grassholme channels:

The work up to and including 1987 has been written-up for publication. The 1988 studies on comparisons of survival and growth of unfed salmon fry and 6 weeks fed fry were completed satisfactorily and gave useful results. Arrangements are in hand for a repetion in 1989, with slight modification of design.

4. Stream studies:

The routine observations on stream fish populations at Llanbrynmair and Cow Green continued in 1988 and will be pursued in 1989.

The opportunist stocking of salmon fry in Bollihope Burn in 1988 has been written up as a report to customers. A repeat is planned for 1989.

5. General comments:

(a) Mr T. Gledhill suffered a heart attack in the autumn of 1988. His likely input to the project in 1989 is, at present, not clear. However, F.B.A. management is aware of the problem and is expected to respond helpfully.

(b) The present contract is due to end on March 31, 1990. It is likely that F.B.A. will submit a request to MAFF for continuation funding for a period of 1 to 3 years to facilitate conclusion of the long term studies at Cow Green and LLanbrynmair and writing-up of the results.

D. T. Crisp.
9 February, 1989.

Publications and Reports:

Published:

Crisp D.T. (1988) Water temperature data from streams and rivers in northeast England. F.B.A. Occasional Publication 26, 1-60.

Crisp D.T. (1988) Prediction, from temperature, of eyeing, hatching and "swim-up" times for salmonid embryos. Freshwater Biology 19, 41-48.

In press:

Crisp D.T. (in press) Comparison of the physical properties of real and artificial salmonid eggs and of their performance when drifting in an experimental stream channel. Hydrobiogia.

Crisp D.T. (in press) Use of artificial eggs in studies of washout depth and drift distance for salmonid eggs. Hydrobiologia.

Crisp D.T. (in press) Some impacts of human activities on trout populations. Freshwater Biology.

Crisp D.T. & Carling P.A. (in press) Observations on siting, dimensions and structure of salmonid redds. Journal of Fish Biology.

Crisp D.T. (in press) Some effects of application of mechanical shock at varying stages of development upon survival and hatching time of British salmonid eggs. Hydrobiologia

Submitted or soon to be submitted:

* Crisp D.T. Water temperature in a stream gravel bed.

* Crisp D.T. Simplified methods of estimating daily mean stream water temperature.

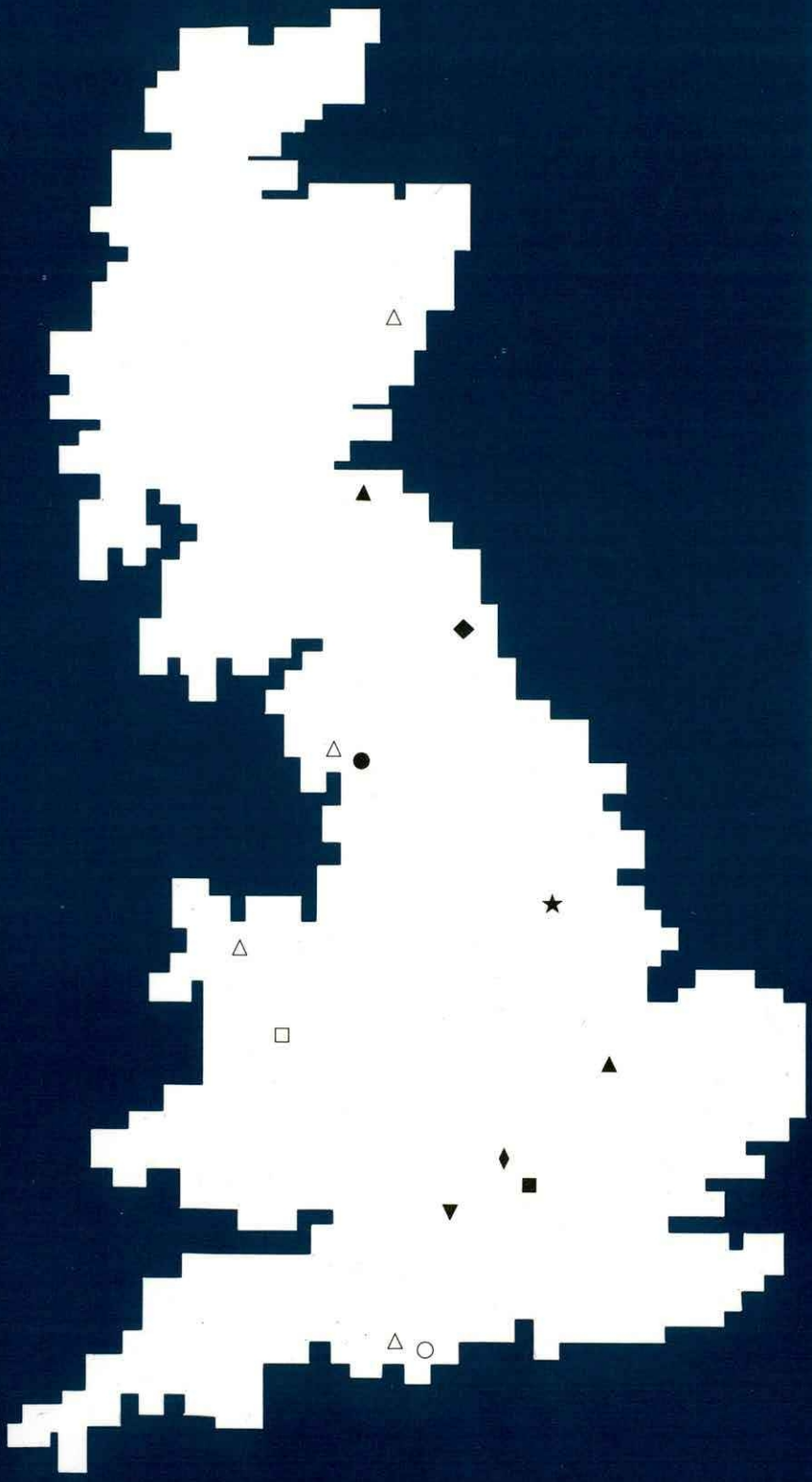
Crisp D.T. Experiments on downstream movement of recently emerged trout (Salmo trutta L.) and salmon S. salar L.) in experimental stream channels.

Reports to customers:

Crisp D.T. (1988) Dispersal of salmon (Salmo salar L.) fry from the point of stocking - experiment in Bollihope Burn, Co. Durham during 1988.

Crisp D.T. (1988) The effects of a sand layer upon swim-up success in U.K. salmonids.

* Papers arising from other projects, but relevant to the present contract.



● **FRESHWATER BIOLOGICAL ASSOCIATION**
The Ferry House, Far Sawrey
Ambleside, Cumbria LA22 0LP
Tel: 09662 2468 Fax: 6914
Telex: 8950511 ONEONE G
REF 16173001

○ **The River Laboratory**
East Stoke, Wareham
Dorset BH20 6BB
Tel: 0929 462314 Fax: 462180
Telex: 8950511 ONEONE G
REF 16174001

■ **INSTITUTE OF HYDROLOGY**
Wallingford, Oxon OX10 8BB
Tel: 0491 38800 Fax: 32256 Telex: 849365

□ **Plynlimon Office**
Staylittle, Llanbrynmair
Powys SY19 7DB
Tel: 05516 652

INSTITUTE OF TERRESTRIAL ECOLOGY

▲ **Edinburgh Research Station**
Bush Estate, Pencuik, Midlothian EH26 0QB
Tel: 031-445 4343 Fax: 3943 Telex: 72579

△ **Banchory Research Station**
Hill of Brathens, Glassel
Banchory, Kincardineshire AB3 4BY
Tel: 03302 3434 Fax: 3303 Telex: 739396

△ **Merlewood Research Station**
Grange-over-Sands, Cumbria LA11 6JU
Tel: 04484 2264 Fax: 4705 Telex: 65102

▲ **Monks Wood Experimental Station**
Abbots Ripton, Huntingdon, Cambs PE17 2LS
Tel:04873 381 Fax: 467 Telex: 32416

△ **Bangor Research Station**
Penhros Road, Bangor, Gwynedd LL57 2LQ
Tel: 0248 364001 Fax: 355365 Telex: 61224

△ **Furzebrook Research Station**
Wareham, Dorset BH20 5AS
Tel: 0929 51518 Fax: 51087

♦ **INSTITUTE OF VIROLOGY**
Mansfield Road, Oxford OX1 3SR
Tel: 0865 512361 Fax: 59962 Telex: 83147

★ **UNIT OF COMPARATIVE PLANT ECOLOGY**
Dept of Plant Sciences, Sheffield University, Sheffield S10 2TN
Tel: 0742 768555 Fax: 760159 Telex: 547216

◆ **UNIT OF WATER RESOURCES SYSTEMS RESEARCH**
Dept of Civil Engineering
Newcastle University
Newcastle upon Tyne NE1 7RU
Tel: 091-232 8511 Fax: 261 0191 Telex: 53654

▼ **DIRECTORATE OF TERRESTRIAL & FRESHWATER SCIENCES**
Natural Environment Research Council
Polaris House, North Star Avenue
Swindon SN2 1EU
Tel: 0793 40101 Fax: 511117 Telex: 444293

DIRECTORATE OF TERRESTRIAL & FRESHWATER SCIENCES

Natural Environment Research Council