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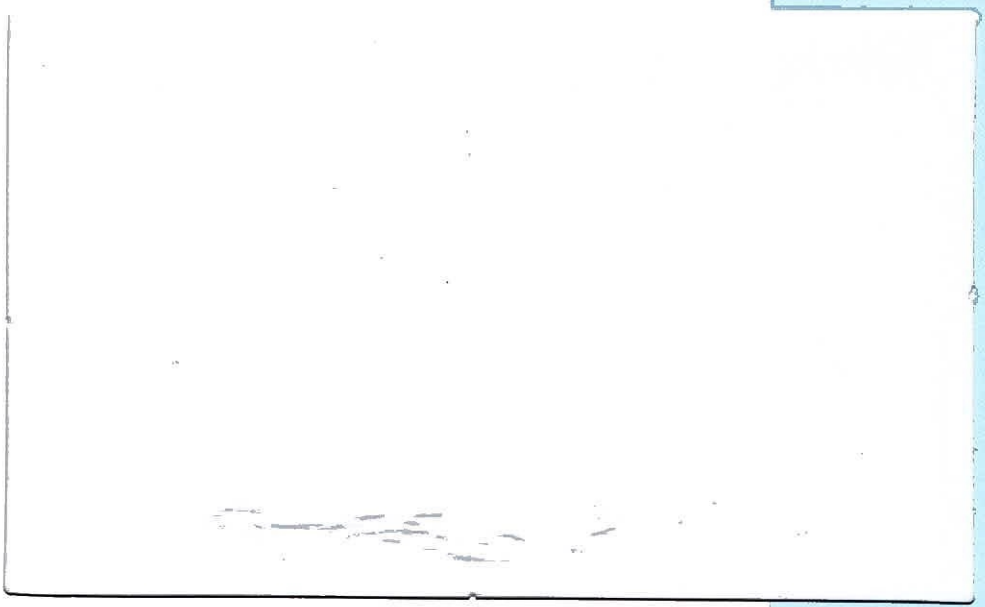
Centre for Ecology & Hydrology



Centre for
Ecology & Hydrology
NATURAL ENVIRONMENT RESEARCH COUNCIL

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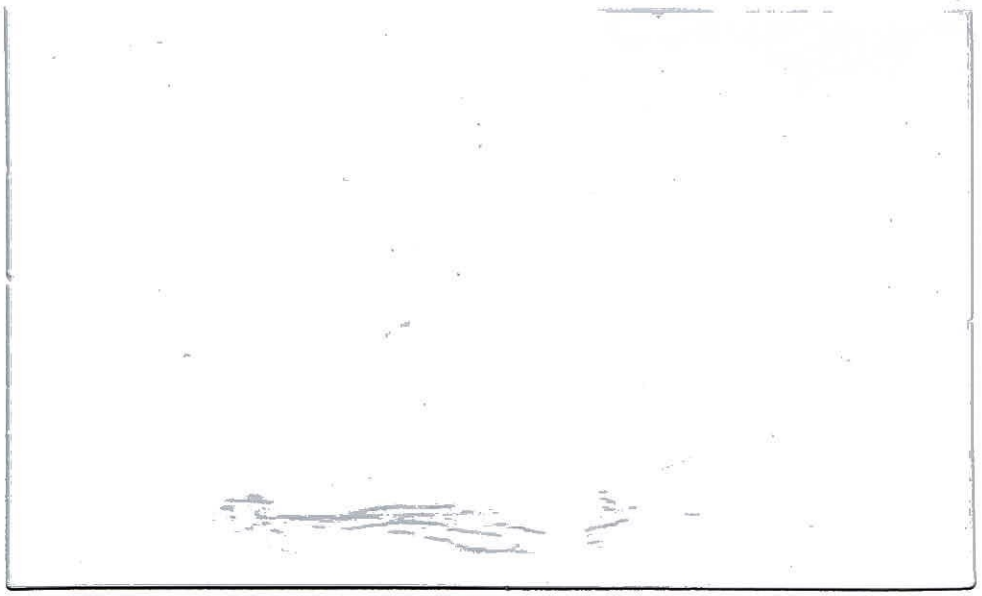

The CEH mission

- To advance the sciences of ecology, environmental microbiology (including virology) and hydrology through high-quality and internationally recognised research leading to a better understanding and quantification of the physical, chemical and biological processes relating to land and freshwater and living organisms within these environments.

- To investigate, through monitoring and modelling, natural changes in the ecological, microbiological and hydrological environments, to assess both past and future changes and to predict man's impact on these environments.

- To secure, expand and provide ecologically and hydrologically relevant data to further scientific research and provide the basis for advice on environmental conservation and sustainable development to governments and industry.

- To promote the use of the Centre's research facilities and data, to provide research training of the highest quality and to enhance the United Kingdom's research base, industrial competitiveness and quality of life.

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NATURAL ENVIRONMENT RESEARCH COUNCIL

CEH Dorset
Winfrith Technology Centre
Winfrith Newburgh, Dorchester
Dorset, DT2 8ZD
United Kingdom

Telephone +44 (0) 1305 213500
Main Fax +44 (0) 1305 213600
www.ceh.ac.uk

Tadnoll Brook; 2006
Salmon Parr Surveys

A T Ibbotson
F Edwards
R Lauridsen
W R C Beaumont
A Pinder

Project Leader:	A T Ibbotson
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1. EXECUTIVE SUMMARY

In March 2006 approximately 12,500 swim-up salmon fry were introduced to three sections of the Tadnoll Brook above Tadnoll Mill. Surveys in July and the autumn after introduction showed they had been successful, resulting in densities of parr that were comparable to densities found in the main River Frome.

PIT tag readers have been installed, along with an easement for upstream adult migration at Tadnoll Mill and these will monitor the emigration of smolts and adult returns in future years.

2. BACKGROUND

A recent review (Ibbotson *et al.*, 2006) of the status of the salmon population in the Tadnoll Brook found that there had been no natural salmon spawning taking place in the Tadnoll Brook above Tadnoll Mill since the late 1990s. This compares with data from the 1970s when there is evidence that the Tadnoll Brook supported a healthy population that made a significant contribution to the River Frome total smolt output.

Although the reasons for the extinction of the population were not certain, the report concluded that the most likely cause was a series of low winter flows in the 1980s interacting with a partially impassable barrier at Tadnoll Mill, stopping the returning adult salmon from reaching their spawning grounds.

2.1 2006 Activities

Since that report (Ibbotson *et al*, 2006) two major activities have taken place to reinstate salmon into the Tadnoll Brook above Tadnoll Mill.

- A migration easement was constructed on the step structure at Tadnoll Mill. In mid 2006 a series of passive integrated transponder (PIT) tag detectors was installed on the step structure at the Mill and in the flood by-pass channel around the Mill. These were installed to monitor the escapement of salmon smolts and the return of adults.

- Six incubation boxes were set up at Watergates Fish Farm within which eggs from six pairings of wild River Frome adult salmon were reared. Swim up fry from these incubation boxes were stocked into three regions of the Tadnoll Brook above Tadnoll Mill (Figure 1) in March 2006.

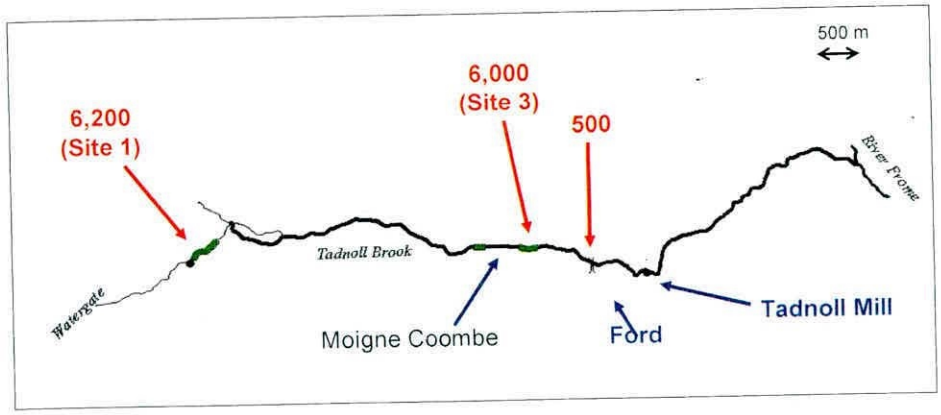

Figure 1 Location and numbers of swim-up salmon fry stocked into the Tadnoll Brook

Since installation the easement has caused some serious erosion in the Mill garden and the Environment Agency is currently repairing this. Unfortunately, this work has meant that the management of water passage around the Mill has been variable and the easement itself has been dry for some periods. The impact of this on the subsequent migration of adults upstream is not known and will in some part depend on whether the work is completed before the main migration period in November/December.

2.2 2006 Surveys

Two surveys were undertaken during 2006.

- In July 2006, the whole river between Site 4 (immediately downstream of Tadnoll Mill) and Site 2 (upstream of Moigne Coombe) (Figure 2) was surveyed to investigate the distribution of stocked salmon parr a few months after the introduction.

- In August/September 2006, five discrete sites were surveyed (Table 1; Figure 3). All salmon captured in these surveys were PIT tagged in order to monitor their migration out of Tadnoll Brook; their contribution to the River Frome smolt population; their subsequent contribution to the River Frome adult salmon population and their return or otherwise to the Tadnoll Brook.

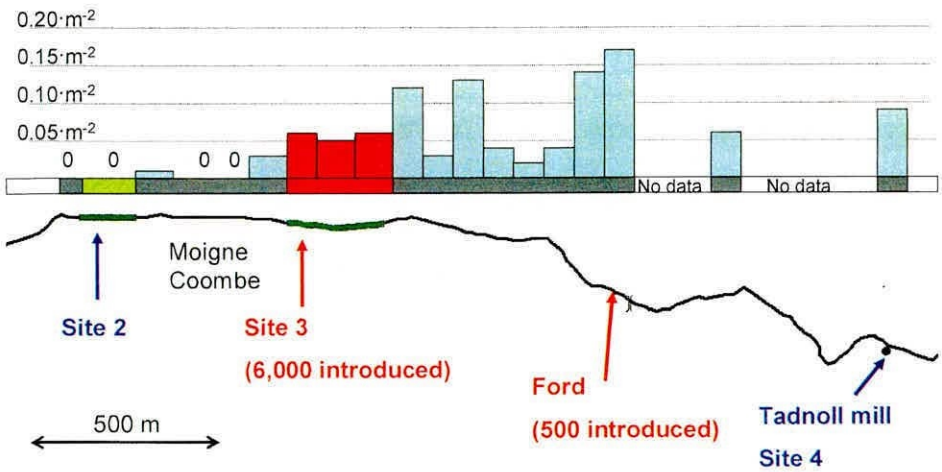

Figure 2 Densities of salmon parr in July 2006 within 100 m sections between Moigne Coombe and Tadnoll Mill

Table 1 Densities of salmon parr at five survey sites on the Tadnoll Brook in August/ September 2006

Site Number (see Figure 2)		Grid Reference	Density of salmon parr (n m^{-2})
1	(Watergates)	SY 746 873	0.076
2	(U/S Moigne Coombe)	SY 771 871	0
3	(D/S Moigne Coombe)	SY 779 872	0.079
4	(Tadnoll Mill)	SY 794 871	0.005
5	(Broomhill Bridge)	SY 813 881	0.034

Figure 3 Location of salmon parr survey sites in August/September 2006

2.3 Results from Surveys

The July survey clearly showed that salmon parr had distributed several hundred metres downstream from the original stocking site below Moigne Coombe (Site 3), but that upstream distribution was minimal, such that no salmon were found 500 metres above the stocking site. Average densities of approximately eight fish per 100 m^2 are similar to average densities found in the River Frome during annual parr surveys, although care should be taken in making this comparison as parr surveys of the Frome are usually done later in the year.

In the area of river upstream of Tadnoll Mill the autumn surveys (Table 1) showed similar densities of fish at the sites where swim up fry had been stocked, but zero to low densities in regions where they had not been stocked. Below Tadnoll Mill, densities of approximately three fish per 100 m^2 were found which is consistent with densities found in recent years in that part of the river (see Figure 3, Ibbotson *et al.*, 2006). This is lower than the densities found in the stocked sites, and it is suggested that these fish represent immigration from natural spawning that occurs in the main river rather than spawning that has occurred in the Tadnoll Brook.

3. FUTURE WORK

Redd counts of the Tadnoll Brook will be made during January 2007. It is hoped these will be complemented by redd counts of the River Frome but it is not certain whether these will be funded.

PIT tag readers situated on the Tadnoll Brook and at East Stoke on the smolt counter and adult counter will monitor the emigration as smolts and return as adults of the salmon parr introduced into the Tadnoll Brook.

We are considering the possibility of repeating the introduction with incubation boxes again in 2006/2007, however this is dependent on regulatory permission and resources (the outcome of the CEH reorganisation is not yet known).

Salmon parr surveys will take place again in the autumn of 2007.

4. REFERENCES

Ibbotson A T, Beaumont W R C and Dunbar M (2006) Tadnoll Brook; A review of the historic and present salmon population. Report to Wessex Water. 18pp.

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CEH Sites

Director's Office
CEH Swindon
NERC, Polaris House,
North Star Avenue
Swindon, Wiltshire SN2 1EU
Telephone +44(0) 1793 442516
Main Fax +44(0) 1793 411528

CEH Swindon
NERC, Polaris House,
North Star Avenue
Swindon, Wiltshire SN2 1EU
Telephone +44(0) 1793 411500
Main Fax +44(0) 1793 411528

CEH Banchory
Hill of Brathens,
Banchory,
Aberdeenshire AB31 4BY
Telephone +44(0) 1330 826300
Main Fax +44(0) 1330 823303

CEH Bangor
University of Wales, Bangor,
Deiniol Road,
Bangor, Gwynedd LL57 2UP
Telephone +44(0) 1248 370045
Main Fax +44(0) 1248 355365

CEH Dorset
Winfrith Technology Centre,
Winfrith Newburgh, Dorchester,
Dorset DT2 8ZD
Telephone +44(0) 1305 213500
Main Fax +44(0) 1305 213600

CEH Edinburgh
Bush Estate,
Penicuik,
Midlothian EH26 0QB
Telephone +44(0) 131 4454343
Main Fax +44(0) 131 4453943

CEH Lancaster
Lancaster Environment Centre,
Library Avenue, Bailrigg,
Lancaster LA1 4AP
Telephone +44(0) 1524 595800
Main Fax +44(0) 1524 61536

CEH Monks Wood
Abbots Ripton,
Huntingdon,
Cambridgeshire PE28 2LS
Telephone +44(0) 1487 772400
Main Fax +44(0) 1487 773467

CEH Oxford
Mansfield Road,
Oxford,
Oxfordshire OX1 3SR
Telephone +44(0) 1865 281630
Main Fax +44(0) 1865 281696

CEH Wallingford
Maclean Building, Crowmarsh Gifford,
Wallingford,
Oxfordshire OX10 8BB
Telephone +44(0) 1491 838800
Main Fax +44(0) 1491 692424

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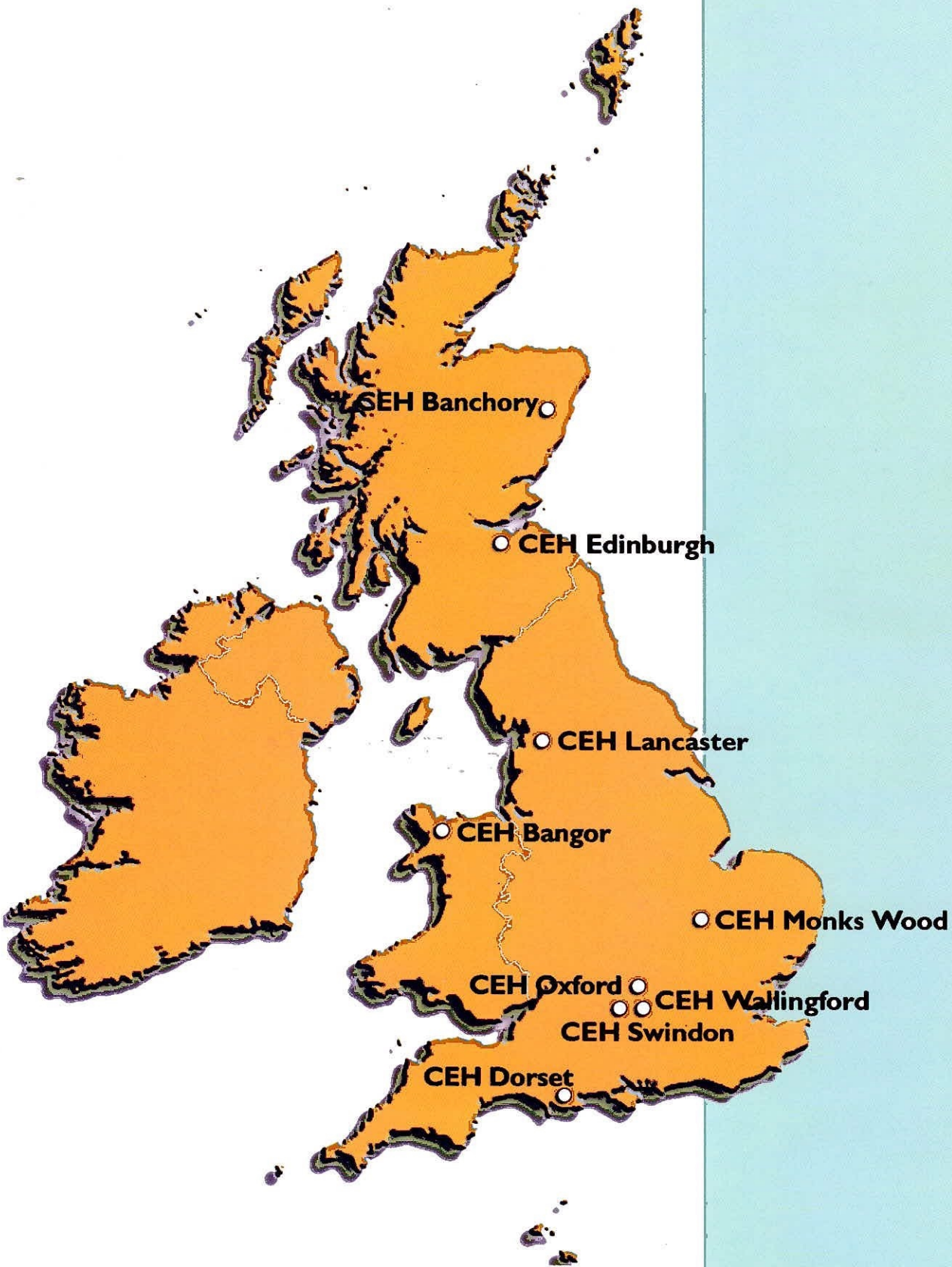

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