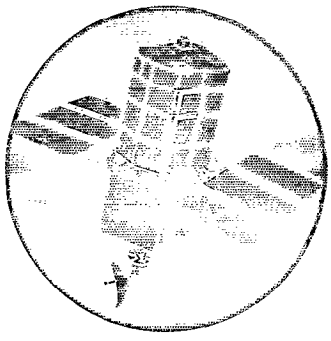
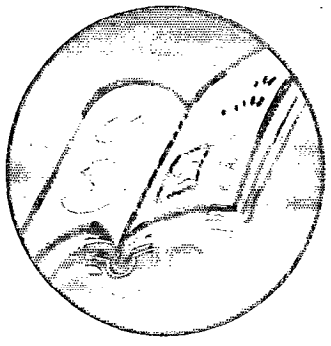
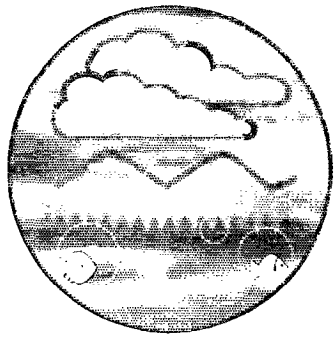
A Comparison of Breeding Bird Numbers along Canals with and without a Close Fishing Season

Research and Development
Technical Report
W193

British Trust for Ornithology

ENVIRONMENT AGENCY

All pulps used in production of this paper is sourced from sustainable managed forests and are elemental chlorine free and wood free

A Comparison of Breeding Bird Numbers along Canals with and without a Close Season for Fishing

Technical Report W193

J H Marchant, R D Gregory, D E Balmer, S J Gough and A M Wilson

Research Contractor:
British Trust for Ornithology

Further copies of this report are available from:
Environment Agency R&D Dissemination Centre, c/o
WRc, Frankland Road, Swindon, Wilts SN5 8YF

tel: 01793-865000 fax: 01793-514562 e-mail: publications@wrcplc.co.uk

Publishing Organisation
Environment Agency
Rio House
Waterside Drive
Aztec West
Almondsbury
Bristol BS32 4UD

Tel: 01454 624400 Fax: 01454 624409

ISBN: 1 85705 051 7
© British Trust for Ornithology and the Environment Agency 1999

All rights reserved. No part of this document may be produced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise without prior permission of the Environment Agency.

The views expressed in this document are not necessarily those of the Environment Agency. Its officers, servants or agents accept no liability whatsoever for any loss or damage arising from the interpretation or use of the information, or reliance upon views contained herein.

Dissemination Status
Internal: Released to Regions
External: Released to Public Domain

Statement of use
This report will be of use to the Environment Agency and the British Trust for Ornithology when considering the value of coarse fish close seasons to nature conservation. The report assesses data from along canals and investigates whether differences in breeding bird numbers could be attributed to the presence or absence of a close season.

Research contractor
This document was produced under R&D Project W1-031 by:

British Trust for Ornithology
National Centre for Ornithology
The Nunnery
Thetford
Norfolk IP24 2PU

Tel: 01842 750050 Fax: 01842 750030

This report has also been released as BTO Research Report 211

Environment Agency's Project Manager
The Environment Agency's Project Manager for R&D Project W1-031 was:
Geraldine Daly - Anglian Region

R&D Technical Report W193

CONTENTS

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

Coarse fish close seasons for fishing apply currently on some canals but not on others. The Environment Agency is considering whether to abolish the statutory coarse fish close season for fishing on canals throughout England and Wales. Information on the value of close seasons to nature conservation is needed to inform this decision. For birds, such data should ideally encompass both the densities and the productivity of waterside breeding species.

The British Trust for Ornithology's Waterways Bird Survey (WBS) is an extensive long-running data set on the numbers of breeding birds of linear waters throughout the UK. WBS data from English and Welsh canals were examined to investigate whether differences in breeding bird numbers could be attributed to the presence or absence of a close season. Survey data were available during 1989-97 for 31 canals with a close season and 20 without. Most of the sample canals with a close season were in the Midlands and Thames regions, whereas those without were mainly in the North West.

An independent set of bird census data was collected in 1998, using Waterways Breeding Bird Survey (WBBS) transect methodology, along 66 canal stretches of which 32 were subject to a fishing close season. Half the stretches were surveyed by BTO volunteers and the remainder by experienced members of BTO staff. The WBBS data comprised counts of all bird species in up to ten 500-metre sections per stretch. RHS data were collected in parallel by the Institute of Freshwater Ecology and were available for 86% of the 541 WBBS sections.

In both the 1989-97 WBS data and the 1998 WBBS results, mean territory densities of waterside bird species often differed between canals with and without a close season. Some were commoner on canals with a close season and others on those without. Such differences appear to stem, however, from the different geographical distributions of the two samples of canals or from other ecological factors not associated with the fishing regime.

Neither WBS nor WBBS data provided evidence that counts of breeding birds differ systematically between canals with and without a close season for coarse angling.

Sites not differing in the numbers of breeding birds could nonetheless differ in their breeding productivity and hence their status as sources or sinks for the population as a whole. This important question was not addressed in the present study. A further programme of new fieldwork would be needed to discover whether and how the breeding success of waterbirds along canals is influenced by fishing and other sources of disturbance.

KEYWORDS

Coarse fish
Close seasons
Canals
Birds
Waterways bird surveys
Waterways breeding bird surveys

1 INTRODUCTION

The Environment Agency has a primary statutory duty to maintain, improve and develop fisheries in inland waters in England and Wales, including canals. In doing so it has secondary duties to further the conservation of flora and fauna of special interest, and to take into account any impact of its activities on flora and fauna generally.

Coarse fishing on canals may be subject to a statutory close season from 15 March to 15 June inclusive, during which all coarse angling is prohibited. A statutory coarse fish close season is also in force on all rivers, streams and drains. However, byelaws have dispensed with the close season on some canals; around 30% of the canal network has no close season and is open for coarse angling year-round. For historical reasons the proportions of canals with and without a close season differs between Environment Agency regions. The Agency is currently seeking to resolve the present inconsistencies in canal close seasons, either by introducing a close season on all canals, or by removing the close season thus permitting fishing all year on all English and Welsh canals (except some Sites of Special Scientific Interest (SSSI)).

In formulating its policy on this issue, the Agency has considered the effects of a close season on fisheries. A recent report commissioned by the Agency found no evidence that fish stocks were systematically either higher or lower in canals with a close season (Hendry & Cragg-Hine 1997). The main influence on fish productivity and community structure in canals was identified as the intensity of boat traffic. No evidence was found that fishery performance had declined where the close season had been removed. Expert opinion collated by these authors was that "*angling during the close season is not harmful to fish populations*". They concluded that the evidence from fisheries "*indicated that there would not appear to be justification for maintaining a close season for coarse fish angling on canals*". Its abolition would have socio-economic benefits for the angling community.

Having received this advice, the Agency proposed that "*lifting the close season on the majority of canals is the only rational way forward for fisheries*". The change would apply on all canal stretches where fish stocks were separate from those in any adjoining river systems and where formal conservation status, such as SSSI designation, was lacking. However, having established that removal of the close season would not be detrimental to fisheries, the Agency must consider the impact on recreation and conservation.

The aim of the present report is to examine whether fishing close seasons affect the populations of breeding birds along canals. The literature on the effects of fishing disturbance on birds is very sparse. At reservoirs, shore-anglers, present for long periods, often still but with short bouts of vigorous activity, are regarded as more disturbing to winter wildfowl than other bank users such as birdwatchers, walkers and picnickers, and may drive wildfowl from preferred feeding sites or cause them to depart (Bell & Austin 1985). Wildfowl species vary markedly in their susceptibility to such disturbance, depending on their nervousness and on their preferred sites for feeding (Tuite *et al.* 1984). On rivers, Croonquist & Brooks (1993) have investigated the effect on bird communities of disturbance, as defined as the difference between a forested site and an agricultural and residential one. However, we are not aware of any previous studies that have attempted to evaluate the effects of anglers on the breeding birds of linear waters.

Whether there is a close season might affect:

- the numbers of breeding territories established per unit length of canal, particularly of those bird species that make greatest use of the canal itself or its banks; and

- the nesting productivity of birds alongside the canal, which itself could contribute to effects on breeding densities by altering the rates of recruitment to the breeding population.

However, it is not clear whether a close season would necessarily be expected to benefit bird populations. The answer would depend on the ability of a species to cope with constant moderate levels of disturbance and on its sensitivity to a sudden onset of disturbance, possibly at a high level, in mid June. For some bird species sensitive to disturbance, breeding densities might be higher on canals closed for fishing during spring than on canals where fishing is taking place, but this apparent benefit might be negated by lower breeding productivity owing to disturbance beginning suddenly as the close season ends.

Fishing effort along canals with a close season is greatest in the autumn, whereas on canals without a close season it is concentrated into the period between March and June (Hendry & Cragg-Hine 1997). Fishing disturbance throughout the spring might encourage birds to position their nests in places shielded from its effects, perhaps away from the canal itself, while disturbance beginning in mid June, at the end of a close season, might result in increased breeding failure rates for species nesting or tending broods on or close to the canal banks at that time. At present, however, we can only speculate on such matters, based on what we know of birds' natural history; there is a clear need for specific evidence from carefully designed surveys.

The magnitude of any angling-related difference in breeding bird populations, and thus its detectability, would also depend on the levels of disturbance caused by coarse angling and by other kinds of human activity. Boating, walking, cycling, dog-walking and other activities each impose levels of disturbance that vary markedly between canal stretches.

This report examines whether the densities or community structure of birds holding territory differ systematically between canals with and without a close season, using two independent sets of bird count data. The question of breeding success lay beyond the scope of the present project and requires separate investigation.

2 METHODS

The study had two major components. First, a review was undertaken of historical data collected by the BTO through its Waterways Bird Survey (WBS). Second, data for specially selected samples of canals with ("closed") and without ("open") a close season for fishing were collected by the BTO in the 1998 breeding season, partly by volunteers and partly by BTO staff. This second part of the study was conducted using the transect methods being tested concurrently for a potential new monitoring scheme, the Waterways Breeding Bird Survey (WBBS).

2.1 Review of existing Waterways Bird Survey data

The WBS is an ongoing annual census of breeding birds along rivers and canals carried out by volunteers and organised by the BTO (Taylor 1984, Marchant *et al.* 1990). It began in 1974. Survey stretches are chosen by the volunteers themselves and average between 4 km and 5 km in length. The bird census method used is territory mapping, which produces an estimate of breeding numbers and a map of breeding territories for each species, stretch and year. Observers are asked to make nine visits to their site annually. Only a restricted list of bird species, incorporating all waterside specialists such as grebes, ducks, geese, swans, waders, and reed-bed passerines, is included in the survey.

2.1.1 Samples of WBS stretches available

The WBS archives were searched for canal stretches that could be classified as either "open" or "closed" according to information received from the Environment Agency (A Taylor, pers comm). In respect of changes made to canal fishing seasons, particularly in 1989 and 1990, it emerged that only two WBS canal stretches were without a close season prior to 1989; pre-1989 data therefore provided little comparison between "open" and "closed", and were discarded, while only those stretches providing data for years between 1989 and 1997 were retained. On the advice of the Environment Agency, one further stretch was omitted because its waters were not sufficiently separated from the adjacent river, and another because a close season applied on only part of the length surveyed (A Taylor, pers comm).

In all, 50 stretches were included. Table 1 lists the 31 stretches contributing to this study where a close season was in force, and Table 2 the 20 where there was no close season. One stretch on the Huddersfield Narrow Canal, WBS code 223, had a close season in 1989 but not subsequently, and appears in both tables.

The distribution of the 50 stretches is plotted in Figure 1. Canals with a close season ("closed") were mainly in the Midlands and Thames Agency regions, and those without ("open") were mostly in the North West. This difference, which follows from the regionally biased distribution of canal close seasons generally and is not a feature solely of the WBS sample, adds complications to the analysis because regional differences are to be expected in breeding bird densities (*eg* Gibbons *et al.* 1993), and could confound any differences resulting from differences in fishing seasons.

Table 1. Waterways Bird Surveys 1989-97 along canals with a close season for fishing ("closed").

EA region	Canal	WBS code	Length (km)	Altitude (m)	Grid references	Years & no. of surveys
Midlands	Birmingham & Fazeley	234	5.1	81	SP186938 - 202988	1989-93 (5)
Midlands	Chesterfield	253	16.0	25	SK596791 - 695815	1989-92 (3)
Southern	Chichester	354	4.0	8	SU858036 - 842013	1989-97 (9)
Midlands	Coombe Hill	64	4.3	9	SO886272 - 849265	1989-97 (5)
Midlands	Droitwich	345	4.0	38	SO888630 - 860600	1989-90 (2)
Midlands	Erewash	439	5.4	55	SK454471 - 469431	1994-97 (4)
Midlands	Gloucester & Sharpness	432	3.7	10	SO746085 - 737050	1993 (1)
Anglian	Grand Union	427	3.7	107	SP695916 - 664927	1993-96 (4)
Anglian	Grand Union	380	5.5	100	SP720902 - 727878	1991-97 (7)
Anglian	Grand Union	358	5.4	76	SP908270 - 883309	1989-95 (6)
Anglian	Grand Union	430	3.7	83	SP915230 - 929202	1993-97 (5)
Midlands	Grand Union	377	4.6	110	SP138821 - 181804	1991-97 (7)
Thames	Grand Union	188 †	5.4 5.5	103	SP892141 - 923140	1989-97 (4)
Thames	Grand Union	267	4.8	38	TQ043904 - 053856	1989-97 (9)
Thames	Grand Union	176	4.9	43	TQ062940 - 043903	1989-97 (9)
Thames	Grand Union	280	4.7	31	TQ141843 - 180837	1989-97 (9)

Midlands	Grantham	367	3.4	29	SK639367 - 608368	1990-97	(7)
Midlands	Grantham	346	4.9	46	SK676307 - 711292	1989-97	(9)
North East	Huddersfield Narrow	223*	4.7	187	SE039119 - 078139	1989	(1)
South West	Kennet & Avon	355	3.0	30	ST770662 - 752642	1989-97	(8)
Midlands	Oxford	341	3.8	16	SP443793 - 481779	1989-90	(2)
North West	Shropshire Union	359	5.5	91	SJ685343 - 672392	1990-94	(5)
Midlands	Shropshire Union	371	5.0	99	SJ869115 - 845157	1991-97	(7)
Midlands	Stafford & Worcs	374	3.2	44	SO853825 - 842804	1991-97	(7)
Midlands	Stafford & Worcs	473	4.0	87	SO860973 - 867937	1997	(1)
Midlands	Stafford & Worcs	465	5.5	46	SO862849 - 856809	1996-97	(2)
Midlands	Stafford & Worcs	464	4.5	58	SO862887 - 864855	1996-97	(2)
Midlands	Stafford & Worcs	334 ††	7.0 3.3	73	SJ973214 - 995226	1989-97	(9)
Midlands	Stratford on Avon	450	3.5	97	SP187711 - 188677	1994-97	(4)
Welsh	Swansea	471	4.5	40	SN752065 - 722041	1994-96	(2)
Thames	Wey Navigation	425	3.1	18	TQ050578 - 056604	1993-97	(5)

Notes:

* Site 223, which had a closed season in 1989 but not subsequently, appears also in Table 2.

† At site 188, 5.5 km were surveyed in 1989-90 and 5.4 km in 1996-97.

†† At site 334, 7.0 km were surveyed in 1989 and 3.3 km in 1990-97.

Table 2. Waterways Bird Surveys 1989-97 along canals without a close season for fishing ("open").

EA region	Canal	WBS code	Length (km)	Altitude (m)	Grid references	Years & no. of surveys
South West	Exeter	320	4.6	2	SX940894 - 963861	1989-97 (9)
South West	Grand Western	451	5.0	93	SS973122 - 999137	1996-97 (2)
North West	Huddersfield Narrow	462	5.0	140	SD992046 - 974007	1995-97 (3)
North East	Huddersfield Narrow	223*	4.7	187	SE039119 - 078139	1990-91 (2)
North West	Lancaster	401	4.3	19	SD487452 - 482483	1991-97 (7)
North West	Lancaster	423	7.0	50	SD521854 - 530804	1990-97 (8)
North West	Leeds & Liverpool	235	6.5	15	SD375052 - 376102	1989-90 (2)
North West	Leeds & Liverpool	457	6.5	19	SD443121 - 494104	1995-97 (3)
North West	Leeds & Liverpool	237	6.3	5	SD460203 - 461149	1989-97 (6)
North West	Leeds & Liverpool	364 †	3.0 5.5	20	SD523092 - 507099	1990-97 (7)
North West	Leeds & Liverpool	352	3.0	21	SD494104 - 524093	1989-97 (9)
North East	Leeds & Liverpool	444	4.5	48	SE223365 - 259356	1994 (1)
North West	Llangollen Branch, Shr U	474	4.7	60	SJ626553 - 611508	1997 (1)
North West	Macclesfield	368	4.0	135	SJ933779 - 937817	1990-97 (8)
North West	Macclesfield	480	3.0	160	SJ952856 - 961884	1997 (1)
North West	Peak Forest	479	3.5	160	SJ961884 - 976856	1997 (1)
North West	Rochdale	400	3.3	135	SD889113 - 884083	1991-95 (5)