

AN OVERVIEW OF AERODROME BIRD CONTROL AND RELATED
ACTIVITIES IN THE UK

T. Brough

Aviation Bird Unit

ADAS Worplesdon Laboratory

Ministry of Agriculture, Fisheries and Food

Worplesdon, Guildford

Surrey GU3 3LQ

SUMMARY

This paper briefly describes the methods used to control birds on aerodromes in the UK. Military and civil practices are compared and developments in procedures are related.

1. INTRODUCTION

The purpose of this paper is to describe, in general terms, the measures undertaken in the UK to control birds on aerodromes and in their vicinity. Reference will be made to some changes which have taken place over the years and military and civil practices will be compared.

All military flying in the UK is controlled by the Ministry of Defence (MOD) and responsibility for bird control on military aerodromes rests with a body designated C(MR)2 in the National Air Traffic Services (NATS). Previously this latter role was fulfilled by the Inspectorate of Flight Safety (IFS) which, however, remains responsible for the collection and analysis of military birdstrike statistics and maintains an interest in en-route and low-level strikes.

The Civil Aviation Authority (CAA) is responsible for the safety regulation of UK civil aviation. Its Directorate of Aerodrome Standards (DAS) licences aerodromes, but individual aerodrome operators are responsible for standards of aerodrome bird control. Advice is provided by DAS to assist in this task. Civil birdstrike statistics are collected and analysed by the Safety Data and Analysis Unit (SDAU) of the Airworthiness Department, another part of CAA.

Research and advice on bird control have been provided for both MOD and CAA since 1962 by what is now known as the Aviation Bird Unit (ABU) of the Ministry of Agriculture, Fisheries and Food (MAFF). Formerly this work was co-ordinated by the UK national birdstrike committee known as the Bird Impact Research and Development Committee of MOD (Procurement Executive). This committee was disbanded in 1978 although a small group, representing those parts of MOD and CAA which funded the ABU, continued to meet to review the work of the latter. At the same time, CAA arranged for an annual Bird Hazard Meeting, the purpose of which was to appraise interested parties in aviation circles about the work being undertaken by the ABU and to canvass views on areas where more work was desirable.

Having indicated the major authorities at national level responsible for regulating bird control, commissioning or undertaking research and giving advice and instruction, some of the more important activities will now be reviewed.

2. IDENTIFICATION OF BIRD REMAINS

In common with the practice in many other countries, birdstrikes are recorded on forms which are submitted to the appropriate authorities for addition to the national military and civil birdstrike databases. Because people reporting incidents frequently had difficulty in identifying the species of birds involved, they were requested in 1966 to submit remains of birds to ABU for identification whenever possible. This service has continued ever

since and the results are incorporated into the national birdstrike databases. From analysis of the data (eg Rochard & Horton 1980), it appears that the general birdstrike situation does not change markedly over a period of several years. Moreover, many people on aerodromes are now able to identify whole specimens of the common species quite adequately, so remains are now submitted only if the sender is unsure of the identification, thereby saving some time for the ABU.

Where the remains of birds are sparse, which is increasingly the case of those submitted to ABU, identification is assisted by examination of feather fragments under a comparison microscope using developments of the technique first described by Chandler (1916). Recognition to species level with this method, however, remains difficult. It is possible to distinguish between groups such as swans, geese and ducks but separation of the five gull species commonly occurring in European birdstrikes, and which range in weight from 275-1690 g (Brough 1983), remains problematical. Consequently, bio-chemical techniques are being investigated in attempts to resolve this difficulty.

3. BIRDSTRIKE STATISTICS AND THEIR ANALYSIS

MOD IFS analyse Royal Air Force (RAF) birdstrike data but their annual reports are not generally available. However, some information appears periodically in papers which they have produced in recent years on European military birdstrikes (eg Turner 1986).

On the civil side, CAA SDAU publishes annual analyses of birdstrikes to UK registered aircraft (eg Thorpe 1987).

It is widely recognised that the analysis and interpretation of birdstrike data are beset by difficulties. These stem mainly from the great variation both in reporting standards and in the circumstances in which the incidents occur. This generally means it is misleading to attempt to make simple comparisons between, for example, one aerodrome and another or between different airlines, yet such comparisons are invariably made. While both IFS and SDAU, are aware of these shortcomings, neither has the time, staff and perhaps the necessary expertise to attempt anything better. The ABU is, therefore, trying to improve the situation by applying to the birdstrike databases more sophisticated analytical techniques generally used to analyse rather variable biological data. So far, only the civil statistics are being examined in this way and only aerodrome factors are under investigation. Subsequently the work will be extended to compare birdstrikes on different kinds of aircraft and propulsion units as well as with different species of birds. It is hoped to carry out a similar analysis on the military data.

4. SAFEGUARDING PROCEDURES

Analysis of birdstrike data leads to a better understanding of the birdstrike hazard and indicates some areas where remedies ought to be applied. It is well known that the great majority of

strikes of
therefore
as possib
developme

The regul
the UK (I
planning
safeguardi
hazardous
aerodromes
and most c
flying.
are public
in which a
below, 200
"aerodrome
safeguarde
safeguardin
on a circle

Consultatio
sites, rese
sanctuaries
quarries w
potential I
the require
only with
provisions

Consultatio
safeguarded
advice on o
for safegua
the advice
advice from
merits and s
hazards dep
attracted, t
and projecte

A large num
and here it
used and the
irrespective
very attract
difficult to
There may th
from the bir
it may be po
bird control
hours of day
established
standard meas
of bird scar
however, that

strikes occur on, or in the vicinity of, aerodromes and it is therefore necessary to keep these localities free of birds as far as possible. Consequently, aerodromes are safeguarded from certain developments which might cause the local bird population to increase.

The regulations concerning safeguarding against bird problems in the UK (Department of the Environment 1981) require that local planning authorities consult the appropriate military or civil safeguarding authorities regarding all proposals for potentially hazardous developments within 8 statute miles (13 km) of major aerodromes. These aerodromes include all military flying stations and most civil aerodromes used for instruction and public transport flying. Safeguarding circles with a radius of 8 statute miles are published on maps and delineate that area around an aerodrome in which aircraft, flying on a 3 degree approach, will be at, or below, 2000 feet. This is the altitude band in which 99% of "aerodrome" birdstrikes occur. Smaller aerodromes, which are not safeguarded by CAA or MOD, are advised to establish their own safeguarding procedures with their local planning authorities based on a circle with a radius of 5 miles (8 km).

Consultation is required for all applications involving landfill sites, reservoirs, sewage disposal works, nature reserves or bird sanctuaries. It also extends to works such as gravel pits and quarries which are likely to become expanses of open water or potential landfill sites in the future. It should be noted that the requirements are purely for consultation and in connection only with applications for proposed developments. There are no provisions for controlling existing features.

Consultations for planning applications affecting civil aerodromes safeguarded by CAA are undertaken by DAS who, if necessary, seek advice on ornithological aspects from the ABU. Executive authority for safeguarding military aerodromes rests with MOD PL (Lands) on the advice of NATS C(MR)2 who, in turn, obtain ornithological advice from the ABU. Every case has to be considered on its merits and subjective assessments have to be made on the potential hazards depending on the numbers and kinds of birds likely to be attracted, their proximity to aircraft movement areas, and current and projected flying activity levels.

A large number of planning applications are for landfill sites and here it is important to know what kinds of infill are to be used and their relative attractiveness to birds. Domestic refuse, irrespective of how it is treated before tipping, is invariably very attractive. In areas of dense human population, it is often difficult to find suitable sites where refuse can be dumped. There may then be strong commercial pressures to use sites which, from the bird hazard point of view, are best avoided. Sometimes it may be possible to accede to such a request on condition that bird control is carried out at the landfill site throughout the hours of daylight. The ABU has itself carried out a trial which established that bird control can be completely successful using standard measures such as broadcast distress calls and the firing of bird scaring cartridges. Great effort was made to ensure, however, that bird control was exercised continuously throughout

the hours of daylight. Unfortunately, when similar measures have been attempted by local authorities or by their contractors, it has too frequently been found that the operators have not maintained a consistent presence and birds have been able to feed. An interval of only half an hour is all that gulls may need to meet their daily food requirement and for the site to remain attractive to them. Inadequacies of this nature have to be taken into account before approval for such methods is given. The use of large nets to exclude birds from sites has proved more successful but, as this is an expensive and rather elaborate procedure, it is not used very often although it is recommended.

Another example of "safeguarding" is the annual arrangement whereby racing pigeon fanciers are notified of the requirements regarding the mass release of birds in the vicinity of aerodromes. Early each year, before the pigeon racing season begins, CAA DAS and MOD IFS produce a list of aerodromes subject to restrictions. The list is published by the Royal Pigeon Racing Association (RPRRA) and thereby comes to the attention of all the major pigeon racing organisations throughout the country. In agreement with the RPRRA, no large numbers of racing pigeons are to be released within a radius of 7 nautical miles (13 km) of the 25 major civil airports licensed by CAA. For other aerodromes, all liberations within 7 nautical miles have to be notified to Air Traffic Control (ATC) in writing 14 days prior to the date of release and additionally by telephone 30 minutes before release time. On receipt of the 30-minute warning, the liberation may be delayed by up to 30 minutes, or exceptionally for a longer period, for ATC purposes. These restrictions apply to releases of large numbers of pigeons on organised races; there are currently no restrictions placed on the siting of pigeon lofts in the vicinity of aerodromes. Although such restrictions would be desirable from an air safety point of view, there is insufficient evidence to warrant the difficult task of seeking prohibitions.

5. HABITAT MANAGEMENT ON THE AERODROME

The problem always dealt with habitat management outside the boundaries of the aerodrome which is largely effected by the control of undesirable developments. This section considers habitat management on the aerodrome proper where greater control of activities should be achievable because no outside bodies are involved. However, operational requirements concerning aircraft movements impose restrictions which seriously limit the bird control measures which may be undertaken. For the main part, UK aerodromes comprise buildings, roads, taxiways, runways and grass and there is generally little that can be done to alter these features. The grass areas, however, may be very extensive.

In the UK, joint research carried out by MOD and ABU clearly indicated that airfield grass maintained at a height of 15 to 20 cm was considerably less attractive to birds than the traditional short gang-mown grass (max. 10 cm) (Brough & Bridgman 1980). As a consequence, grass is now grown up to 20 cm high wherever possible on the majority of aerodromes in the UK along the lines

of the main
and summarise
as a bird
it is more
short, conc
ground main
obtain new
from the st
attempts to
before long
their number
annual "bot
the clipping
are underta
such mainte
proposes to
future.

6. BIRD CONTROL

The broadcast
cartridges,
from UK aer

A request m
into the po
subsequent fo
the potentia
Sturnus vul
(Brough 196
the recordi
species (eg
of this wo
Politics Verte
the Institu
Ministry of
by ABU at t
other countr
available co
IMD) MOD, UK

The original
in the comm
its trade m
were widely
ago. At tha
by various
investigated
bird distress
to use this
bird-scarers
some custom
manufacturers

The firing c
are commonly

of the maintenance procedures described by Mead & Carter (1973) and summarised in CAP384 (CAA 1981). The adoption of long grass as a bird control measure has been slow. This is largely because it is more expensive to maintain grass in a long, rather than short, condition and there has been a natural reluctance amongst ground maintenance staff to change established practices and to obtain new equipment. At some places there have been departures from the standard maintenance recommendations of Mead & Carter in attempts to derive a financial benefit from hay or silage crops before long grass is required to deter birds in early autumn when their numbers are increasing. Sometimes the relatively expensive annual "bottoming out" procedures in spring, intended to remove the clippings from the several topping cuts of the previous summer, are undertaken less frequently to reduce costs. As a variety of such maintenance practices appears to have developed, the ABC proposes to investigate and review the situation in the near future.

6. BIRD CONTROL - SCARING

The broadcasting of bird distress calls and the firing of bird-scaring cartridges, are the two most frequent methods of scaring birds from UK aerodromes.

A request made by the MOD in 1962 for MAFF to undertake research into the possible use of recorded distress calls resulted in the subsequent formation of the ABU. At that time, MAFF was investigating the potential use of recorded distress calls to disperse starlings *Sturnus vulgaris* from cherry orchards and from their roost sites (Brough 1969). The control of birds on aerodromes necessitated the recording and field testing of distress calls of different species (eg gulls (*Laridae*) and lapwing *Vanellus vanellus*). Some of this work was done co-operatively with the *Laboratoire des Petits Vertebres* and the *Laboratoire de Physiologie Acoustique* of the *Institut National de la Recherche Agronomique* of the French Ministry of Agriculture (Bremont et al. 1968). Recordings made by ABU at that time are still widely used both in the UK and in other countries. (Copies for use on aerodromes and elsewhere are available commercially from Wingaway, North Euston, Louth, Lincs, LN11 3BE, UK).

The original research and development work on distress calls resulted in the commercial production of broadcasting equipment known by its trade name of SAPPHO. Various versions of this equipment were widely used on aerodromes but production ceased several years ago. At that time, good quality in-car cassette equipment produced by various manufacturers was appearing on the market. The ABU investigated simple modifications of this equipment for broadcasting bird distress calls and subsequently encouraged aerodrome operators to use this cheap alternative (Horton 1979). Such bio-acoustic bird-scarers (BABS) are now widely used on UK aerodromes although some custom-built equipment is now also produced by a few manufacturers for use on aerodromes, farms and elsewhere.

The firing of bird-scaring cartridges, or shellcrackers as they are commonly called, is often carried out as a supplementary aid

to playing distress calls. They are also used on their own although then they may become less effective if fired too frequently. They are, however, very popular and are perhaps the most widely used single bird-scaring device on UK aerodromes.

The shellcrackers employed are all 12 bore and they are often fired from a 1.5 inch signal pistol, using an adaptor sleeve to accommodate the smaller cartridge, but some custom-made pistols are also employed. The cartridges are never fired from shotguns. Certificates for the possession and use of pistols and cartridges must be obtained from the local police and there are strict requirements regarding the storage, transportation and use of these items.

7. BIRD CONTROL - KILLING

Birds are shot on some aerodromes but only when all other methods of control have been tried and have failed for some reason. In common with legislation in other EEC countries, the Wildlife and Countryside Act 1981 protects all species of wild birds although a small number of common pest species can be killed by authorised persons ie. land-owners or persons authorised by land-owners. But, in particular, and under the terms of a general licence, common airfield species such as the lapwing, black-headed gull Larus ridibundus and common gulls L. canus, (and on some named aerodromes, oystercatcher Haematopus ostralegus) can be killed for the purposes of flight safety. The only practical way of taking these birds on an airfield is by shooting and this limits the number of birds likely to be taken at any time but it is perfectly adequate as a reinforcement to the more usual scaring measures and to enhance the response of birds to shellcrackers, for instance.

Under the conditions of the licence to kill or take birds on aerodromes, an annual report has to be sent to the Department of the Environment (DOE) which administers the Wildlife and Countryside Act. MOD aerodromes belong to the Crown and are not therefore subject to the regulations but MOD has undertaken to abide by the spirit of the Act. As aerodrome operators submit their information direct to DOE, it is unlikely that the aviation authorities will be aware of the amount of killing which is undertaken for flight safety purposes.

In exceptional circumstances, such as when colonies of breeding herring gulls occur on aerodromes or on air weapons ranges, licences may be obtained to use stupeficient baits in order to take and remove birds (Rochard 1987). These measures are generally carried out, or supervised by, ABU and are never undertaken lightly.

The use of falcons is included under this heading because it may entail some killing to reinforce scaring potential. As a general rule, falcons and hawks are rarely used to control birds on aerodromes in the UK, and then only on a small number of military aerodromes.

For example aid to bird or three of publicity va contractors (below) also contractors airfields at in the UK.

8. BIRD CONTROL

On the milit on aerodrom Service (AFS the need are results dep involved, so In the early falcons and The ABU were had no extr techniques shellcracker a trial of Junior Non-C RAF manned remaining st chosen for t ABU.

This situati dissatisfacti BCUs. This for providing it was decide time later, was appointed for BCU activ change and, being civilian at a time. manager who h and their ope of the staff qualifications

Understandably unified appro greater scope has frequently by AFS at the the larger on Safety Units maintain a mob counterparts,

For example, the Royal Navy has for many years used falcons as an aid to bird control in conjunction with standard methods on two or three of its aerodromes and has derived some benefit from the publicity value associated with these birds. Some of the civilian contractors employed to control birds on RAF airfields (described below) also have the facility to use these birds, as do some contractors employed on specialised MOD (Procurement Executive) airfields and on those used by the United States Air Force Europe in the UK.

8. BIRD CONTROL ORGANISATION

On the military side, responsibility for carrying out bird control on aerodromes has traditionally resided with the Airfield Fire Service (AFS) who were asked to scare birds on the airfield, as the need arose, by ATC. This situation produced rather variable results depending upon the enthusiasm of the many individuals involved, some of whom were clearly not very keen or effective. In the early 1960s, MOD gave further consideration to the use of falcons and hawks as a means of controlling birds on aerodromes. The ABU were of the opinion that full-time bird controllers, who had no extraneous duties, would be as effective, using basic techniques such as distress call broadcasts and the firing of shellcrackers, as the falconers, and this view prevailed. After a trial of Bird Control Units (BCUs), each consisting of one Junior Non-Commissioned Officer and two Senior Aircraftmen, the RAF manned some 20 of its major aerodromes in this way, the remaining stations continuing as they had done before. The staff chosen for the BCUs were all volunteers and were trained by the ABU.

This situation worked effectively for some time, although some dissatisfaction was felt regarding the line management of the BCUs. This was resolved when IFS relinquished its responsibility for providing advice on bird control within the RAF to NATS when it was decided that BCUs should be staffed by ATC personnel. Some time later, a Central Bird Control Co-ordinating Officer (CBCCO) was appointed within NATS C(MR)2 to provide specialist supervision for BCU activities. A subsequent decision resulted in a further change and, over a period of years, the BCUs are progressively being civilianised in groups of about four or five adjacent aerodromes at a time. The contractor for each group employs a regional manager who has overall responsibility for the aerodrome managers and their operatives. Unlike their military predecessors, some of the staff employed in these civilian units have biological qualifications.

Understandably, the civil side does not have the same kind of unified approach to bird control as the military and there is greater scope for diversity. As on the military side, bird control has frequently been undertaken by ATC or, perhaps more frequently, by AFS at the behest of ATC. At some airports, and particularly the larger ones operated by BAA plc, there are Manoeuvring Area Safety Units or similar groups which, apart from other duties, maintain a mobile bird control presence, like that of their military counterparts, throughout the operating hours of the airport. On

large airports, the staff work on a shift basis. At smaller airfields, the same one or two individuals might be employed throughout the working day. Manchester International Airport is unusual in that it has a small specialist team devoted solely to bird control and headed by a qualified biologist.

The requirement for civil aerodromes to carry out bird control stems from the Air Navigation Order which stipulates that aerodromes used for most instruction and public transport flying must be licensed by CAA. Before granting a licence, CAA must be satisfied that the applicant is competent and experienced and has the necessary arrangements to ensure that the aerodrome is safe for aircraft. Included amongst these arrangements is the requirement that it must have prepared an Aerodrome Manual. This describes for aerodrome operating staff the procedures relevant to their duties, including those for the control of bird hazards. The CAA must be satisfied that the procedures laid down for bird control in terms of bird detection and dispersal by means of habitat management and scaring measures etc. are adequate in relation to the perceived nature of the bird problem and the kind and amount of air traffic. When an aerodrome is licensed, it is subject to periodic inspections from the Authority's aerodrome inspectors on a variety of technical aspects associated with aerodrome operations, and bird control practices are monitored. At less frequent intervals, ABU are requested to carry out surveys of birds and related control matters on aerodromes and provide specialist advice.

9. ADVICE AND TRAINING

Basic advice and recommendations on bird control on aerodromes are contained in CAP384 "Bird control on aerodromes" published by CAA. On the military side, the Joint Services Publication 318A Annex 6 fulfils a similar role and is based on the same information but it contains some details appropriate only to service operations. This latter document is not on general release outside the service. In addition to these two publications, ABU produces reports on aspects of bird control of interest to aerodrome operators (eg Burton 1986, Brough 1987, Milson & Rochard 1987) and these are generally distributed to all major aerodromes by CAA and MOD as appropriate. ABU also publish their research findings in the scientific literature so that they are more widely available.

Aerodromes which are experiencing problems with bird control or related matters can obtain advice from CAA Directorate of Aerodrome Standards or the Central Bird Control Co-ordinating Officer at NATS. If necessary, the assistance of the ABU is called for; this is in addition to the periodic surveys of aerodromes which CAA or NATS may request.

Training courses for staff engaged in any capacity on bird control on aerodromes have been held at least annually by ABU since 1966. The first course was arranged specifically to train RAF instructors when distress call broadcasting equipment was generally introduced on to military airfields. Subsequently, the courses were increased to accommodate 30 people at a time from both military and civil

aerodromes, airfields, the courses for s all now held bird control have recently courses for th

ACKNOWLEDGEMENTS

This paper, a carried out u Civil Aviation pleasure to colleagues in

REFERENCES

Brough, T. (1986) roosts and the 6, 403-410.

Brough, T. (1987) Worpleston.

Brough, T. (1988) MAFF, Worpleston.

Brough, T. & B (1989) as a bird rep 17, 243-253.

Chandler, A.C. (1987) with reference California Publ

Civil Aviation CAP384. CAA, London.

Department of t technical sites Planning (Aerod

Horton, N. (1987) report. CAA, London.

Horton, N. (1988) Worpleston.

Mead, H & Cart (1987) bird repellent Society, 28, 21

aerodromes. Recently, with the advent of civilian BCUs on RAF airfields, the military training requirement has decreased but courses for staff from civil aerodromes continue and these are all now held at a CAA venue and are arranged by CAA DAS. Basic bird control courses last one week but some three-day courses have recently been provided for more senior staff and as refresher courses for those who have received earlier training.

ACKNOWLEDGEMENTS

This paper, and much of the work which it describes, has been carried out under contract to the Ministry of Defence and the Civil Aviation Authority to whom all thanks are due. It is a pleasure to acknowledge the involvement of past and present colleagues in the Aviation Bird Unit.

REFERENCES

- Brough, T. (1969). The dispersal of starlings from woodland roosts and the use of bio-acoustics. Journal of Applied Ecology, 6, 403-410.
- Brough, T. (1983). Average weights of birds. ABU Report. MAFF, Worplesdon.
- Brough, T. (1987). Starling roosts and aerodromes. ABU Report. MAFF, Worplesdon.
- Brough, T. & Bridgman, C.J. (1980). An evaluation of long grass as a bird repellent on airfields. Journal of Applied Ecology, 17, 243-253.
- Chandler, A.C. (1916). A study of the structure of feathers, with reference to their taxonomic significance. University of California Publications, 13, 243-446.
- Civil Aviation Authority. (1981). Bird control on aerodromes. CAP384. CAA, London.
- Department of the Environment. (1981). Safeguarding of aerodromes, technical sites, and explosive storage areas. Town and Country Planning (Aerodromes) Direction 1981. Circular 39/81. DOE, London.
- Horton, N. (1979). Bio-acoustic bird scarers (BABS). Un-numbered report. CAA, London.
- Horton, N. (1986). Gulls and aerodromes. ABU Report. MAFF, Worplesdon.
- Mead, H & Carter, A.W. (1973). The management of long grass as a bird repellent on airfields. Journal of the British Grassland Society, 28, 219-221.

Milsom, T.P. & Rochard, J.B.A. (1987). Lapwings and birdstrikes. CAA Paper 87015. CAA, London.

Rochard, J.B.A. (1987). The use of stupefacients to control colonies of great black-backed and herring gulls. ABU Report, MAF, Worplesdon.

Rochard, J.B.A. & Horton, N. (1980). Birds killed by aircraft in the United Kingdom. Bird Study, 27, 227-234.

Thorpe, J. (1987). Analysis of bird strikes to UK registered aircraft. CAA Paper 87012. CAA, London.

Turner, C.J. (1986). Military aircraft bird strike analysis 1983-1984. 18th Meeting Bird Strike Committee Europe, Copenhagen 1986, Working Paper 30.

United States Summary

(Russell P. D.)