



Review of Urban Gulls and their Management in Scotland

A report to the Scottish Executive

May 2006



Review of Urban Gulls and their Management in Scotland

(Research contract ENV/BTO/001/04)

A report to the Scottish Executive

Calladine¹, J.R., Park², K.J., Thompson³, K. & Wernham¹, C.V

¹BTO Scotland & ²Centre for Conservation Science
School of Biological and Environmental Sciences,
University of Stirling, Stirling. FK9 4LA; ³Independent consultant
(E-mail: chris.wernham@bto.org)

May 2006

© Crown copyright 2006

ISBN: 0-7559-6075-0

Scottish Executive
St Andrew's House
Edinburgh
EH1 3DG

Produced for the Scottish Executive by Astron B47070 05/06

Published by the Scottish Executive, May, 2006

Further copies are available from
Blackwell's Bookshop
53 South Bridge
Edinburgh
EH1 1YS

The text pages of this document are printed on recycled paper and are 100% recyclable.

Contents

Executive Summary	5
Acknowledgements	9
1 Introduction and background to the project	11
1.1 The need for the project	11
1.2 Aims of the project	12
1.3 Expertise of contractors	12
<i>1.3.1 BTO Scotland</i>	<i>12</i>
<i>1.3.2 Centre for Conservation Science</i>	<i>13</i>
<i>1.3.3 Dr Kate Thompson</i>	<i>13</i>
2 Research methods	14
2.1 Literature searching	14
2.2 Consultations	14
2.3 Questionnaire survey of Local Authorities in Scotland	15
<i>2.3.1 Aims</i>	<i>15</i>
<i>2.3.2 Design</i>	<i>15</i>
<i>2.3.3 Recipients</i>	<i>16</i>
<i>2.3.4 Content</i>	<i>16</i>
2.4 Gulls at airports	17
3 Local Authority perceptions and knowledge of urban gulls in Scotland	19
3.1 The extent of the problem in Scotland	19
3.2 Size and trends in urban gull populations	20
3.3 Reported problems associated with urban gulls	21
3.4 Mitigation measures used by Local Authorities and perceived effectiveness	24
3.5 Waste strategies	27
3.6 Legislation and powers	27
3.7 Other suggestions from Local Authorities regarding solutions	29
3.8 Gull mitigation measures undertaken by Wellpark Action Group	30
3.9 Costs of urban gull problems to Local Authorities	31
4 Numbers, trends in numbers and status of gulls in Scotland	32

4.1	Background ecology and sources of information	32
4.1.1	<i>Breeding season</i>	32
	General ecology	32
	Surveys, survey methods and limitations	33
	Missing and negative data	36
	Timing of counts	37
	Visibility of nests	37
	Counts based on individual birds	38
	Derivation of trends	38
4.1.2	<i>Outside the breeding season</i>	39
	General ecology	39
	Surveys, survey methods and limitations	39
	Derivation of trends	41
4.1.3	<i>Questionnaire survey</i>	41
4.2	Species accounts	41
4.2.1	<i>Black-headed Gull</i>	41
4.2.2	<i>Common Gull</i>	42
4.2.3	<i>Lesser Black-backed Gull</i>	43
4.2.4	<i>Herring Gull</i>	43
4.2.5	<i>Great Black-backed Gull</i>	44
4.2.6	<i>Kittiwake</i>	45
5	Ecology of gulls in urban areas	56
5.1	Exchange between urban areas and the wider countryside	56
5.2	Breeding success	57
5.3	Survival rates	58
5.4	Recruitment	58
5.5	Food and foraging behaviour	59
5.6	Nest site selection and predation pressure	61
5.7	General causes of changes in gull populations	61
6	Methods for controlling urban gull populations	63
6.1	Non-lethal disturbance methods	63
6.1.1	<i>Broadcasting sounds</i>	63
6.1.2	<i>Use of birds of prey</i>	64
6.1.3	<i>Human disturbance</i>	66
6.2	Manipulation of nesting areas	66
6.2.1	<i>Methods for preventing access, landing or nesting</i>	66
6.2.2	<i>Manipulation of nesting substrates</i>	67
6.2.3	<i>Creation of alternative nesting areas</i>	68
6.3	Manipulation of food sources	68

6.4	Restriction of breeding success	69
	6.4.1 <i>Treatment or removal of eggs or nests</i>	70
	6.4.2 <i>Introduction of predators</i>	71
	6.4.3 <i>Contraception</i>	71
6.5	Removal of adult birds	72
	6.5.1 <i>Use of narcotics</i>	73
	6.5.2 <i>Shooting</i>	73
7	Review of the legislation surrounding control of urban gulls	75
7.1	Legislation to protect wild birds in Scotland	75
	7.1.1 <i>General Licences</i>	76
	7.1.2 <i>Specific Licences</i>	77
7.2	Legislation surrounding littering and waste	77
	7.2.1 <i>Environmental Protection Act 1990 (c. 43)</i>	77
	Part III Statutory nuisances and Clean Air	77
	Part II Waste on Land	78
	Part IV Litter and related issues	78
	7.2.2 <i>Environment Act 1995 (c. 25)</i>	79
	7.2.3 <i>Antisocial Behaviour etc (Scotland) Act 2004</i>	79
	7.2.4 <i>The Street Litter Control Notices Order 1991</i>	79
	7.2.5 <i>Town and Country Planning (Scotland) Act 1997</i>	79
	7.2.6 <i>The Landfill Directive 1993/31/EC</i>	79
7.3	Legislation surrounding planning and building	80
7.4	Public health legislation issues	80
7.5	Gulls, Management Rules and Bye Laws	81
8	Best practice recommendations for mitigating problems involving urban gull colonies	83
8.1	Current limitations on the provision of best practice guidance	83
8.2	Guidance for Local Authorities on mitigation techniques	85
8.3	Future research suggestions	90
	References	92
	Appendices	101
	Appendix 1a Questionnaire survey for Local Authorities	102
	Appendix 1b Covering letter for Local Authorities	110

Executive summary

- I. This project aimed to: (i) produce the most up to date review possible of the size and distribution of urban gull colonies in Scotland, and whether they have changed in recent years; (ii) review current scientific knowledge of the ecology of urban gulls and the reasons they are attracted to Scottish towns and cities; (iii) review management practices used in Scotland and elsewhere and the scientific evidence for, and specific contexts associated with, their success or failure; (iv) establish the extent of perceived problems associated with urban gulls across Scotland, with specific regard to the perceptions and roles of Scottish Local Authorities; (v) review current legislation and powers related to urban gull issues and their perceived effectiveness; (vi) advise on standard best practice guidance for Local Authorities (the contexts in which certain types of mitigation measure are likely to be effective based on current scientific evidence); and (vii) make suggestions for further research needs on urban gull issues in Scotland. The project did not have a remit to assess the extent to which urban gulls are perceived as a problem by the overall Scottish urban population. Nor did it have a remit to advise whether actions to mitigate urban gull problems should be carried out, or to provide guidance on control for any specific locations.
- II. The aims of the project have been achieved by a combination of: (i) literature searching and review; (ii) face-to-face consultations with representatives from Scottish Local Authorities and experts in the fields of gull research, gull control and legislation; and (iii) a questionnaire survey of every Local Authority in Scotland.
- III. A questionnaire survey (completed largely by Environmental Health Department (or equivalent) representatives for every Local Authority in Scotland) demonstrated that there is a widespread perception within these Departments that problems with urban gulls exist. Of the 32 Local Authorities that completed the survey, 27 reported known local populations of urban gulls and 25 reported problems associated with those populations (based largely on a combination of complaints received from the public, reports from colleagues/Councillors and their own general perceptions). Of the 27 that reported known local urban gull populations, 20 felt that gull numbers within their urban areas had increased in the last 10 years (based on a similar combination of information sources). Also based on the survey, aggressive behaviour (mostly restricted to the breeding season), followed by noise, littering and fouling by droppings (largely during the breeding season but also during the winter months in some areas), were perceived as the greatest problems caused by urban gulls, both in terms of frequency of occurrence and severity. The questionnaire survey and follow-up consultations also provided information on Local Authority perceptions about: the effectiveness of various control methods; waste strategies; reasons for the attraction of gulls into urban areas; and the legislation and powers available to Local Authorities to take action if required. The questionnaire survey was not designed to show the extent to which the Scottish population as a whole

perceives urban gulls as a problem: a broader survey of members of the public living and working in urban areas would be required to demonstrate whether a wide-scale problem exists.

- IV. Numbers of urban gulls in Scotland were obtained from the Joint Nature Conservation Committee's 'Seabird 2000' survey database (surveys carried out in 1998-2002 plus some additional material), supplemented by information provided directly by Local Authorities and that from other more local sources (local and Scottish Bird Reports, independent reports). For the purposes of this study, we evaluated information from breeding sites classified as 'urban' by JNCC, and also any gulls nesting on the roofs of buildings (with the exception of *e.g.* derelict buildings on uninhabited islands). Five species of gull have populations in Scotland that breed in urban areas, the current sizes of which have been estimated as (Apparently Occupied Nests): Herring Gull (6,202 AONs); Lesser Black-backed Gull (4,309 AONs); Common Gull (1,656 AONs); Black-headed Gull (1,391 AONs); Great Black-backed Gull (337 AONs). The review discusses in some detail the caveats associated with these estimates and concludes that they may be underestimates, based on: (i) limitations to counting methods (the problems of counting gulls in general, and specifically in urban environments); (ii) a limited number of comparisons between Seabird 2000 and more local survey data; and (iii) the perceptions of some Local Authorities. There are no comprehensive counts available of the numbers of gulls using urban areas outside of the breeding season.
- V. Herring Gulls breeding in urban areas are concentrated in the east-coast towns and cities of Scotland from Dundee to Inverness (with more than half the estimated urban population in 1998-2002 present in the City of Aberdeen). Smaller colonies exist across the Central Belt, in Berwickshire, Ayrshire and in Dumfries. The distribution contrasts with that of urban-nesting Lesser Black-backed Gulls; the latter are concentrated currently in the Central Belt, but with substantial numbers also in Dumfries, Ayrshire and Aberdeen. Of the three less abundant urban-nesting species, the largest concentrations of Common Gulls recorded in 1998-2002 were in Aberdeen and along the Cromarty Firth (400+ AOBs each), urban-breeding Black-headed Gulls were concentrated at Dyce (1050 AOBs), and Great Black-backed Gulls at the Nigg Oil Terminal, Cromarty Firth (136 AONs).
- VI. Recent trends in the numbers of urban-nesting gulls in Scotland can only be reported in a semi-quantitative manner because of uncertainty over the sites that were checked (and so can be stated with certainty to have had no breeding gulls) during the 1993-95 survey, which additionally included only those gulls nesting on roofs. The level of evidence available suggests that urban-nesting colonies of Herring Gulls, Lesser Black-backed Gulls and Common Gulls in Scotland have all increased in the last decade, with some increases in numbers at existing colonies but also the emergence of new colonies. Less information on urban-nesting Black-headed Gulls and Great Black-backed Gulls is available from previous surveys but it is thought that the occurrence of the small number of substantial urban colonies of each is relatively recent.

- VII. The scientific review of urban gull ecology covers the current level of knowledge of mixing of urban and non-urban gulls, breeding success, survival rates, recruitment, food and foraging behaviour, nest site selection and predation pressure, and, where possible, contrasts this information with what is known for gulls breeding in more ‘natural’, non-urban environments. The reviewing revealed a significant lack of information on most of the basic ecology and demographic parameters for urban gulls in Scotland (see point X). The degree of scientific evidence available is insufficient to confirm any hypotheses for the attraction of gulls into urban environments, but the reasons are likely to be complex and to vary between geographical areas and species of gull.
- VIII. The scientific review of methods for controlling urban gull colonies covers: non-lethal disturbance methods (*e.g.* falconry and broadcasting sounds); methods for preventing access to gulls or deterring them from nesting by changing the nesting substrate; methods for restricting breeding success (*e.g.* egg and nest removal, egg oiling); and methods for removing adult birds (trapping and killing). For each technique considered, any scientific evidence to demonstrate success or failure in particular specific contexts is examined rigorously, and the practicalities of applying it in an urban setting evaluated. The reviewing revealed a significant lack of rigorous scientific studies that have tested the success of such control techniques (see point X).
- IX. This study reviewed the legislation surrounding the control of urban gull problems, and accessed the perceptions of Scottish Local Authorities of its effectiveness. This report reviews briefly appropriate parts of the legislation governing the protection of wild birds in Scotland (and allowable reasons for derogations), legislation surrounding littering and waste, planning and building, and public health. Some key areas highlighted by Local Authorities that they would like to see investigated further include: the working definition of “public health and safety” in the context of its use to justify actions under General Licences; legislation that can be used to restrict persistent feeders of large numbers of gulls; use of building regulations to enforce gull-proof designs for new buildings; legislation that might allow enforcement of nest removal or gull-proofing on private buildings or access rights to allow Local Authorities to carry out the work.
- X. A lack of knowledge in several key areas currently limits the extent to which sound scientific advice can be given on the likelihood of the various mitigation measures achieving their intended aims if implemented (and hence the extent to which ‘best practice guidance’ for Local Authorities can be given). In addition, whether a technique is likely to produce the required effect at any given location is likely to depend on large number of factors, including: the species of gull involved; the seasonality of the problem; the geographical scale of the perceived problem; the number of gulls involved; and the specific characteristics of the urban location (*e.g.* accessibility of nesting areas, public access to the site). In order to improve

best practice guidance, we recommend two types of future scientific research (to be focussed on Herring Gulls and Lesser Black-backed Gulls as priorities): (i) intensive studies of the ecology (diet, foraging ranges) and demography (timing of breeding, breeding success, survival rates, recruitment, dispersal) of urban gulls at a suite of representative urban sites across Scotland (or the UK), and (ii) adaptive management studies with rigorous experimental design to assess the effectiveness of key mitigation techniques. Further details of these recommendations are provided in the report.

Acknowledgements

We are very grateful to those Local Authority representatives who attended our initial meeting and helped us to formulate the content of this review (many of whom also participated in completing the questionnaire survey): David Grant and Keith MacKenzie (Dumfries & Galloway Council), Bill Gilchrist and Mike Rooney (East Ayrshire Council), Denis Watney (Scottish Borders Council), Iris Coghill, Brian Gilmour and Lindsay Matthew (Dundee City Council), Colin Campbell (Aberdeenshire Council) and Peter Ewen (Aberdeen City Council). In addition to those above, the following Local Authority representatives kindly gave of their time to contribute to our questionnaire survey and/or attend our discussion workshop: Iain Gibson, Robert O'Neill and Jim Prescott (Glasgow City Council), Brian Donnet and Iain Wallace (Highland Council), Roderick MacDougall (Edinburgh City Council), Andy McClements (Western Isles Council, Comhairle nan Eilean Siar), Brian Robertson (Falkirk Council), Calvin Morrison (Fife Council), Janet Stitt (Inverclyde Council), Chris Reynolds (Midlothian Council), Sandy Innes (Moray Council), Hugh McGhee (North Ayrshire Council), Andrew McPherson (North Lanarkshire Council), Paul Turner (Orkney Islands Council), Douglas Flint (Perth & Kinross Council), Russell McCutcheon (Renfrewshire Council), John Leach (Shetland Islands Council), Brian Lawrie (South Ayrshire Council), Ann Crossar (South Lanarkshire Council), Donald Balsillie (Stirling Council), Patrick Hoey (West Dunbartonshire Council), John Sheldon (West Lothian Council), Danny Johnstone (Angus Council), Alan Morrison (Argyll and Bute Council), Ewart McAuslane (Clackmannanshire Council), Nigel Kerr (East Dunbartonshire Council), Findlay Mackay (East Lothian Council) and Bill Arthur (East Renfrewshire Council).

Rhys Bullman and Phil Whitfield (Scottish Natural Heritage) and Liz Cryer and Martin Milarky (Scottish Executive) contributed to design of the questionnaire survey, and John Crawford and Bill Stafford (East Ayrshire Council), and David Grant (Dumfries & Galloway Council) kindly piloted the survey for us. We are grateful to Chris Bierley, Liz Cryer, Samantha Donald, Lorna King, Martin Milarky, George Morris and Kevin Philpott, all of the Scottish Executive for their advice.

We are also grateful to all of the following for their kind assistance and helpful advice throughout the project: Norman Allan (BAA, Edinburgh Airport), Andy Baxter (Central Science Laboratory), Russell Bowen (Elbow Pest Control, Dundee), Meyrick Brentnall (Gloucester City Council), Tom Dewick (Inverness Airport), Mike Flynn (Scottish Society for the Protection of Animals), Emma Haskell (PICAS UK), Roddy Mavor and Ian Mitchell (Joint Nature Conservation Committee), Gillian McEwan (Glasgow Prestwick International Airport), Alison Park, Peter Rock, Douglas Russell, (Aberdeenshire Council), Jan Seys (Flanders Marine Institute, Belgium), David Sowter, Steve Towell (Angus Hawking Services, Dundee), Paul Walton (Royal Society for the Protection of Birds), Ian Whittaker (North West Bird Control)

We are grateful to Jenny Bright, Clare Clark and Rebecca Cranston (BTO Scotland) for administrative support and Nigel Clark (BTO Thetford) for helpful advice and internal reviewing of the report.

We thank Dr John Coulson for providing helpful comments and suggestions during his independent review of the scientific content of this report.

1 Introduction and background to the project

1.1 The need for the project

The presence of large colonies of urban gulls within towns and cities throughout the UK is increasingly being flagged as a problem for residents, tourism and businesses, and is reported as stretching the resources of several Local Authorities. The most commonly reported problems caused by gulls in urban areas relate to removal of litter from bags and bins, fouling with droppings, the noise resulting from gull activities, and aggressive behaviour towards people during the breeding season, when gulls behave in a territorial manner. These problems were highlighted recently at the UK's first conference on urban gulls organised by Gloucestershire City Council (see <http://www.glos-city.gov.uk/libraries/templates/page.asp?URN=2162>). In Scotland, there has been a recent upsurge in complaints from the public and Local Authority staff about the problems caused by gulls in urban areas (Scottish Executive pers. comm.). The appearance, and increase in numbers, of roof-nesting gulls has been noted elsewhere in Europe, with Herring Gulls first observed nesting on roofs in Belgium, for example, in the early 1990s (J. Seys pers. comm.). There has been interest in starting a project on problems perceived to be associated with urban gulls in Belgium and a summary proposal for this is available on the European Community Initiative INTERREG III B website (<http://www.nweurope.org/page/projetIdea.php?p=22&id=4>). To date, however, no research in Belgium has been carried specifically on urban gull problems, and despite extensive searches, neither we, nor our Scottish Executive contacts, could find any reference to other such projects in mainland Europe.

The issue of urban gulls is a complicated one to address for a number of reasons. Of the five species of gull occurring in urban areas in Scotland, four species (Black-headed, Common, Herring and Lesser Black-backed) are listed currently (on the Amber List, 'medium concern') as Birds of Conservation Concern (Gregory *et al.* 2000, see Chapter 4). The results from the latest full census of breeding seabird numbers in Britain and Ireland ('SEABIRD 2000') provide further evidence of declines in Herring Gull numbers at coastal locations that qualify the species for the UK Red List (Mitchell 2004). In contrast, pronounced increases in numbers of breeding gulls have been observed at existing and new urban colonies (Raven & Coulson 1997, Mitchell *et al.* 2004). The reasons for the divergent population trends between urban areas and the wider countryside are not established scientifically (e.g. Mitchell *et al.* 2004) but the plentiful food supplies provided by street litter and landfill sites, and the safe nesting and roosting areas available have been suggested as making urban areas attractive to gulls.

Many Local Authorities in Scotland have the powers, expertise and knowledge to deal with gull problems and some have already developed best practice guidance to deal with particular issues. All wild birds in Scotland are protected under the Wildlife and Countryside Act 1981 (WCA 1981) but derogations can be granted under Section 16 of the Act to take action for certain stated purposes that would otherwise be illegal. The Scottish Executive issues General Licences annually under Section 16 of the WCA 1981 and sends these to all Scottish Local Authorities, enabling them to take action (including the taking of nests and eggs, and the taking and killing of fully grown birds) against Herring, Lesser Black-backed and Great Black-backed Gulls) for

certain stated purposes. For other gull species, and certain types of control activities (see Chapter 7), individual specific licences can be sought from the Scottish Executive. Evidence to date suggests that there is no common approach to the control of urban gulls across Scotland, however, and that Local Authorities differ in their interpretation of the available legislation and powers contained within the General Licences. Neither are there common guidelines available on the range of control methods available for use and the scientific evidence for their effectiveness.

The issue of urban gulls has been raised a number of times in the Scottish Parliament in recent years. A Members' debate was held in Parliament on 7 November 2002 to discuss the issue. At the end of this debate, Allan Wilson, the Deputy Minister for Environment and Rural Development gave an undertaking to look at the problem, with a view to potentially producing best practice guidance for Scottish Local Authorities on the management of urban gulls. This report contains the findings of the study commissioned by the Scottish Executive as a result of the Scottish Parliament Members' debate.

1.2 Aims of the project

The research aim of this project was to review the problems caused by urban gulls and to, as far as scientifically possible, propose best practice guidance to manage the problem. Specifically, the study aimed:

- To produce a comprehensive scientific review of current knowledge of the ecology of urban gulls, why they are attracted to Scottish towns and the relevant key issues and research areas;
- To identify locations throughout Scotland where urban gulls are or are not perceived as a problem (including the extent of current information on local population sizes and trends and its scientific rigor);
- To review current Legislation and powers, how these are used currently throughout Scotland, and their perceived effectiveness;
- To identify management practices in operation currently in Scotland and elsewhere, review scientific evidence for their success or failure, and contrast their strengths and weaknesses in specific contexts; and
- To propose possible solutions (advise on standard best practice guidance) and highlight areas where further research is likely to be required.

1.3 Expertise of contractors

1.3.1 BTO Scotland

The British Trust for Ornithology (BTO) has existed since 1933 as an independent, non profit-making, scientific research trust, investigating the populations, movements and ecology of wild birds in Britain. The organisation prides itself on carrying out high-quality and impartial research on birds. BTO is not a campaigning organisation

or pressure group, which means that the data gathered and all results published, are objective and unbiased. The BTO Scotland office at the University of Stirling employs a small team of dedicated staff with the remit of undertaking high-quality, impartial research of particular relevance to the Scottish context. The BTO has been at the forefront of developing survey techniques for birds in Britain and has run, or runs currently, UK-wide surveys or annual monitoring of a range of species, as well as multi-species surveys (e.g. the Breeding Bird Survey (BBS), Wetland Breeding Bird Survey (WBBS), Wetland Bird Survey (WeBS); see www.bto.org). This means that the BTO has first-hand expert knowledge of the caveats associated with deriving population estimates from survey data and experience of appraising the quality of such estimates that is second to none. BTO Scotland has staff members with particular expertise on seabirds and gulls (John Calladine and Chris Wernham carried out a previous more general review of gull impacts and control techniques for Scottish Natural Heritage, Calladine & Wernham 1996). The BTO is running a UK-wide survey of wintering gulls in the winters of 2003/04-2005/06, and John Calladine is the Scottish contact point for this survey. Dr Nigel Clark, Head of Projects at the BTO in Thetford, regularly advises designers on ways to mitigate the problems caused by roof nesting Gulls on new large developments.

1.3.2 Centre for Conservation Science

The Centre for Conservation Science, a joint initiative by the Universities of St. Andrews and Stirling, was established in 2001 with funding from the Scottish Higher Education Funding Council. The overall objective of CCS is in the use of advanced analysis techniques to inform on controversies and uncertainties associated with conservation issues, with a particular focus on Scotland. CCS has been involved with a range of programmes related to Scottish conservation management issues, including the ecology and management of invasive species (North American Mink, European Hedgehogs, Sika Deer and *Rhododendron ponticum*), and the impact and management of generalist predators (in particular raptors and gamebirds, Grey Seals and marine and freshwater fisheries). Much of this work involves multi-organisation collaboration, reviewing scientific evidence, evaluating the effects of different management strategies, conflict resolution and stakeholder consultation.

1.3.3 Dr Kate Thompson

Kate Thompson is an independent ecological consultant, who was previously employed as Seabird Monitoring Programme coordinator by JNCC and has first-hand experience of evaluating the quality of gull population data and of dealing with requests for information to assist with conflict situations.

2 Research methods

2.1 Literature searching

The literature searching carried out for this project encompassed published, web-based and 'grey' literature. Information published in peer-reviewed journals was identified using the ISI Web of Knowledge on-line database (<http://wok.mimas.ac.uk/>). Other published and 'grey' literature was found by carrying out web searches using the Google search engine (<http://www.google.co.uk>) and by checking the web sites of appropriate organisations working on urban gulls (*e.g.* university departments, NGOs, private consultants). Published and 'grey' literature from outside the UK was reviewed where appropriate (*e.g.* when looking for studies of particular control measures), and where such information is included, an appraisal of its relevance in the Scottish context has been made whenever possible. Information was also sought from other European countries regarding research conducted on the occurrence of urban gulls, and any associated problems that have been experienced or are perceived due to their presence (see section 1.1).

Information on the numbers, distribution and trends in numbers of urban gulls in Scotland was collated from the Joint Nature Conservation Committee's database of breeding seabirds, from the most recent comprehensive census for 'SEABIRD 2000' and previous national censuses (Mitchell *et al.* 2004), supplemented by other sources where necessary (Scottish and local bird reports and consultations, 2.2 below).

2.2 Consultations

A questionnaire survey was sent to every Local Authority in Scotland (2.3 below). In addition, two meetings were held to discuss the issues further with, and seek additional unpublished information from, Local Authority representatives and other appropriate individuals, as follows:

- An initial meeting with a small number of representatives from Local Authority environmental health departments (or their equivalent) who were known already to Scottish Executive staff and who had direct experience of urban gull problems and trialling solutions to them. This first meeting aimed to gain an initial overview of urban gull problems, as experienced by those in Local Authorities with the remit to address them, and to establish contacts who could share their ideas and expertise with project staff. The agenda was somewhat open to allow discussions to develop in any appropriate directions.
- A discussion workshop, to which every Local Authority in Scotland was invited to bring two representatives, and to which a small number of other interested organisations were invited to bring staff (Scottish Executive, RSPB, SSPCA). This second meeting aimed to present interim results of the project and seek the views of all participants both on these results and on ways forward in terms of future research needs and priorities. Topics on which presentations were made and around which discussions were built were: Urban gull numbers, distribution and trends; ecology of urban gulls and reasons for attraction to Scottish towns and cities; mitigation and control measures and

scientific studies to assess their effectiveness; legislation and powers available to address urban gull problems and their limitations; areas requiring future research and research priorities.

In addition to the two meetings, further one-to-one consultations were made with several pest control consultants, falconers, environmental consultants, airport staff with experience in gull management, and contacts within Scottish Executive to advise on the use of legislation in gull management (see Acknowledgements).

2.3 Questionnaire survey of Local Authorities in Scotland

2.3.1 Aims

A questionnaire survey was designed with the aims of gathering information from across Scotland on the following:

- The scale and distribution of perceived urban gull problems;
- Data held by Local Authorities on the distribution, local population sizes and trends in size of urban gull colonies;
- Gull management practices being operated currently or tried previously, and their perceived effectiveness;
- Knowledge and interpretation of the legislation and powers available to Local Authorities for mitigating urban gull problems, and their perceived effectiveness.

2.3.2 Design

A postal survey for self-completion, rather than face-to-face or phone interviews, was thought to be the most efficient way of obtaining the required information. In addition to reducing the costs of the survey, this approach allowed respondents to complete the survey in their own time and consider, and where appropriate discuss with colleagues, the answers to any questions outside their own immediate areas of expertise or experience.

We defined “urban gull” within the context of the survey as any member of the gull family: in particular Herring, Lesser Black-backed, Great Black-backed, Common, and Black-headed gulls, that are found in and around built-up areas of human habitation were mentioned.

We received and addressed comments on the content and format of questions in the survey from appropriate representatives from Scottish Executive and Scottish Natural Heritage, to ensure that the survey met some of the more applied needs of these organisations. Pilot survey forms were then sent to two Local Authority employees with considerable experience of urban gull related issues, who kindly completed them and commented on the design of the questionnaire. A potential risk with any survey of this nature is that returns are low or that those returned are biased towards respondents

with a perceived problem, as people may be more likely to respond if they are more affected by, or have strong views on, a particular issue (Hoinville & Jowell 1978). The design of the survey attempted to minimise this risk, and all non-replies were followed up by e-mail and telephone so that the response rate was very high (Chapter 3). The use of leading questions was also avoided (Hoinville & Jowell 1978), for example by asking whether there were any perceived problems associated with the presence of urban gulls before asking about the nature and scale of any problems (see 2.3.4 below and Appendix 1a). Questions were kept as short as possible and avoided the use of scientific and technical jargon. Respondents were asked to respond to some questions using tick boxes corresponding to a series of possible answers (with an option for “other” and space for explanatory text) and some were simple “yes” or “no” questions. There were fewer questions of an open nature (to which possible answers could not be pre-determined) and to which a textual reply was required (see Appendix 1a).

Covering letters were sent out with every questionnaire explaining the aim of the survey and of the entire project (see Appendix 1b).

2.3.3 *Recipients*

Due to the necessity to ask questions on a wide range of topics within the survey, it was unlikely that any one employee within a Local Authority would have expertise in all of these issues (*i.e.* gull ecology, pest control, waste strategies and legislation). As much of the survey was concerned with the perceptions of those most directly involved in dealing with urban gull problems, complaints from the public and mitigation strategies (all of which generally fall under the remit of Environmental Health), the questionnaires were sent to the ‘Director of Environmental Health’ (or equivalent) in each of the 32 Local Authorities in Scotland. The recipient was asked to decide on the most appropriate person(s) within their Local Authority to complete the survey. Most questionnaires were eventually completed by senior Environmental Health Officers.

Each person completing the survey was asked to enter some brief information about their role within the Local Authority and the extent to which they had direct experience or responsibilities associated with gulls and/or gull management.

2.3.4 *Content*

The survey consisted of 17 questions, divided into four sections (Appendix 1a). In summary, the issues dealt with were as follows:

- In *Section 1*, respondents were asked whether there were any known local populations of urban gulls within their Local Authority area and whether these were perceived as a problem. If respondents replied “no” to both of these questions, then they were not required to go through the rest of the survey. This section was included at the beginning of the survey in order to maximise returns, particularly from those Local Authorities that have not experienced problems with urban gulls;

- Questions in *Section 2* were concerned with any knowledge respondents had on the size and trends in urban gull numbers in their area, and how any gulls were distributed spatially. They were also asked to provide details of the methods used to obtain any information that they held;
- In *Section 3*, respondents were asked for details of the nature of any problems associated with gulls (*e.g.* aggressive behaviour, fouling), and what information they used to assess these problems (*e.g.* complaints from public);
- Finally, in *Section 4*, questions were asked about the techniques that their Local Authority used to try to reduce any problems associated with urban gulls, the perceived effectiveness of these techniques and the information that they had used to assess effectiveness (*e.g.* reductions in gull numbers, reductions in complaints). They were also asked briefly about their reasons for selecting particular mitigation techniques, about the waste strategies in place in their area and for their comments on the effectiveness of legislation and powers available to them to deal with urban gull problems.

2.4 Gulls at airports and associated research

Although gulls at airports are not necessarily covered by the definition of ‘urban’, we nevertheless contacted most of the airports in Scotland as part of this project, to ask about the presence of, and their problems relating to, gulls at airports, and the experiences that the airport staff had of mitigation measures. Gulls are involved in over 50% of airfield bird-strike incidents within the UK and are the main hazard to aircraft in many other parts of the world (T. Dewick, pers. comm.). These birds are present at all Scottish airfields throughout the year. The cost of repairing damage and other associated elements caused by bird-strikes runs into many millions of pounds per year. Historically, airfield bird-strikes involving gulls in Scotland and elsewhere have also resulted in fatalities (Thorpe 1996). The Civil Aviation Authority (CAA) has a comprehensive document, “CAP 680, *Aerodrome Bird Control*” that can be found at: <http://www.caa.co.uk/docs/33/CAP680.pdf>, which outlines best practice for managing airport birds and the associated behaviour and ecology of the relevant bird species (including gulls). Some level of scaring and/or control is conducted at all airports, records of numbers and species killed are kept and this information is passed on to SEERAD.

The Central Science Laboratory (CSL), an Executive Agency of the UK Government Department DEFRA (Department of Food and Rural Affairs) has a Bird Management Unit, which is involved with the management of bird hazards on and around aerodromes. Planning applications within 8 miles of an airport have to go through the CAA and any applications that may involve a risk of attracting birds are passed to CSL for comment. As part of this remit, CSL have been working with waste management companies to trial a range of techniques for controlling bird numbers (a five-year project ended in April 2004). Individual techniques were trialled for two years each, including careful documentation of the reasons for any failures. Techniques were also tested in combination. The techniques that were apparently most successful were then trialled at five different sites and the results used to draft best practice guidance for the Environment Agency (EA). Results from this work that

have relevance to the current report have been incorporated into Chapter 6. CSL are now working with the EA on a two-year project in Northumberland to investigate the effects of preventing gulls from feeding at landfills in terms of their alternative feeding sites.

3 Local Authority perceptions and knowledge of urban gulls in Scotland

Local Authority representatives in Scotland are at the receiving end of complaints from members of the public, and often their own Councillors, about gulls in urban areas. They have the day-to-day experience of attempting to deal with such issues in the best way that they can, and several Local Authorities in Scotland now have quite extensive experience of such problems, which we hoped to share and learn from during the study. In this chapter we discuss the results of our questionnaire survey to Local Authorities to find out:

- The scale and geographical distribution of perceived problems with urban gulls in Scotland;
- The nature and severity of complaints about urban gulls;
- The extent of knowledge of Local Authorities about the distribution, numbers and trends in numbers of urban gulls in their areas;
- Any gull management practices being operated currently or tried previously by the Local Authorities, the reasons for their choice of method(s) and their perceptions of the effectiveness of the various methods;
- Knowledge of, and interpretation by, Local Authorities of the legislation and powers available to them for mitigating urban gull problems, their perceived effectiveness and limitations.

Details of the form and content of the questionnaire are given in Section 2.3, and the full questionnaire is provided in Appendix 1a. The questionnaire was sent to representatives from all 32 Local Authorities in Scotland and a 100% response rate was achieved. Hence we believe that the results provide a balanced and unbiased picture of the views of Local Authorities in Scotland on the issues discussed in this chapter. We have also included supplementary information gained during consultation meetings and personal communications with key experts (Section 2.2), where this is relevant to the questions addressed here.

3.1 The extent of the problem in Scotland

Our survey indicated that urban gulls are perceived as a problem by Local Authorities throughout much of Scotland. Of the 32 Local Authorities that completed the survey, 27 reported known local populations of urban gulls and 25 reported that the presence of urban gulls was perceived to be a problem by some members of the public and/or the Local Authority. No known local populations of urban gulls were reported by Perth & Kinross, South Lanarkshire, Midlothian and Clackmannanshire Councils, while Inverclyde and West Lothian Councils reported known local populations but no perceived problems.

3.2 Size and trends in urban gull populations

A total of 16 local authorities were able to provide some information on the gull species found in their urban areas: the other 12 responded that they did not know anything about their gulls or did not answer this question. Urban colonies of Herring Gulls were reported most often, and Black-headed Gulls least often (Table 3.1). The pattern is supported by the information on urban gull colonies collected during the Seabird 2000 survey (Mitchell *et al.* 2004; Table 3.1), despite the fact that not all Local Authorities know either which species they have present in their area or that they have gulls present.

Table 3.1 Numbers of Local Authorities reporting local urban gull populations by species and a comparison with the data available in the Joint Nature Conservation Committee's (JNCC) Seabird 2000 database (see Chapter 4). A 'population' is recorded from the Seabird 2000 database if at least one apparently occupied nest was reported.

Species	Number of Local Authorities	
	Respondents	Seabird 2000 data
Herring Gull	13	21
Lesser Black Backed Gull	10	21
Common Gull	8	16
Great Black Backed Gull	5	8
Black-headed Gull	4	8

Most Local Authorities (LAs) with species information reported two (6 LAs) or three (7 LAs) species of gull within the urban environment, with two Local Authorities reporting just one species, and one reporting all five species. Data from the Seabird 2000 survey contain records for one species in two Local Authority areas, two species in twelve areas, three species in two areas, four species in seven areas and five species in three areas.

The survey showed that few Local Authorities monitor the urban gulls within their area on a regular basis. Since 1999, Dumfries & Galloway Council has contracted an independent gull expert to conduct counts of roof-nesting Lesser Black-backed and Herring Gulls each year in Dumfries. These surveys have demonstrated an increase in breeding gull numbers there (Coulson & Coulson 1999-2003, see Chapter 4). Scottish Borders Council also makes regular counts of a particular colony in Eyemouth in an attempt to monitor the success of their control programme on breeding Herring Gulls. Their estimates involve counting nests and making corrections for the number that are missed. They have not carried out appropriate calibration counts for their method but feel that it is adequate to give an indication of trend in numbers (D. Watney, pers. comm.). Dundee City Council also carries out counts of breeding gulls in some specific areas of the city.

Of the 27 Local Authorities that reported known local populations of urban gulls, 20 felt that these had increased in their area within the last 10 years, five felt that they had not increased (in two cases this was reportedly due to control efforts), and three said that they did not know. Although few local authorities used information on gull numbers on which to base their replies (Table 3.2), perceptions of increases

correspond well with the overall population changes that have been recorded between the roof-nesting gull survey in 1994 (Raven & Coulson 1997), and the Seabird 2000 survey in 1998-2002 (Mitchell *et al.* 2004, see Chapter 4).

Table 3.2 Information sources used by Local Authorities to assess changes in the size of local urban gull populations in their areas. Most (17 LAs) used two or more of these information types, whereas nine used one type only.

Information source	Number of Local Authorities
Previous data on local population sizes	4
Complaints from the public/businesses	14
Reports from others (see 3.3 below)	11
Respondents own perception	20

3.3 Reported problems associated with urban gulls

Of the 25 Local Authorities that perceived urban gulls as a problem in their area, complaints from the public or local businesses (reported by 23 LAs) was the most commonly referenced source of this information. Reports from others (used by 13 LAs; including colleagues, Councillors) and the general perception of the respondent (used by 12 LAs), were also used, and many respondents (17 of the 25 LAs) used more than one of these information types.

The perception of urban gulls as a problem within Local Authorities is not restricted to those areas for which high numbers of roof-nesting gulls were reported in the most recent gull survey (Seabird 2000; Mitchell *et al.* 2004). Problems associated with urban gulls were reported from Local Authorities areas where no roof-nesting gull colonies were recorded during the Seabird 2000 survey, whilst not all Local Authorities with roof-nesting gulls present perceive the gulls as a problem (Figure 3.1).

In the questionnaire, we asked for information on the frequency and severity of any urban gull problems experienced by Local Authorities. From previous discussions with their representatives and the Scottish Executive, we provided a list of possible problems: noise, fouling (from droppings), littering (*e.g.* tearing up black bin bags to reach food or removing litter from rubbish bins), damage to property, aggressive behaviour, bird strikes (to aircraft), risk of disease transmission, impacts on other wildlife. We also provided a text box for to allow respondents to list any other problems. Some problems might occur far less frequently than others but be seen as more severe when they do occur, whilst others might be viewed as more trivial but occur much more regularly. For this reason, we asked respondents first about the frequency of particular incidents (from 1 to 5, where 1 = no incidents and 5 = many incidents) and then about the severity of problems (from 0 to 5, where 0 = no incidents, 1 = minor incidents and 5 = severe incidents).

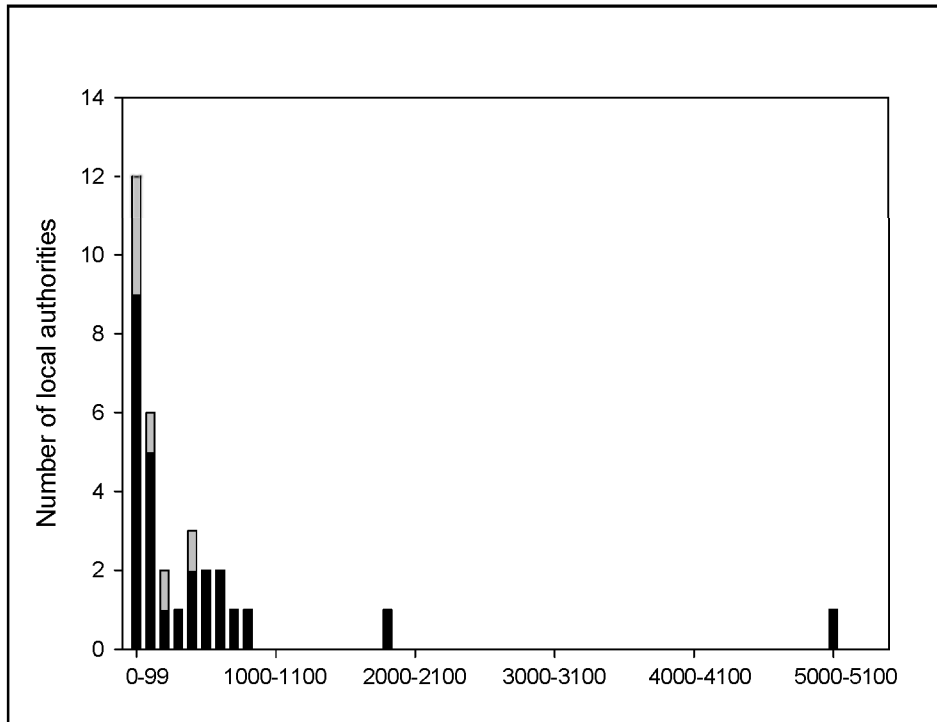


Figure 3.1

Combined numbers of Apparently Occupied Nests (AONs) of all roof-nesting gull species in each Local Authority area throughout Scotland (Source: JNCC data, see Chapter 4). Local Authorities in black are those that reported problems associated with urban gulls; those in grey reported no urban gull problems. Note that these figures do not take the geographical size of LAs or their human population into account.

The aggressive behaviour of gulls during the nesting season scored highest both in the frequency and the severity of the incidents or complaints, with noise, littering and fouling making up the next three highest scoring problems (Figure 3.2a & b). Out of the set of potential problems given, 11 Local Authorities scored aggressive behaviour the highest in terms of frequency and gave a score of four or five (for four LAs, this highest score was shared with fouling or noise). This pattern was repeated with the scores for severity. Twelve Local Authorities scored aggressive behaviour the highest in terms of severity and gave a score of four or five (for six LAs this highest score was shared with noise, fouling or littering). As gulls may behave aggressively during the nesting season in order to protect their eggs or chicks, it is not surprising that Local Authorities reported that problems associated with urban gulls occur largely during summer (21 out of 26 Local authorities). A restricted number of Local Authorities also have problems relating to noise and littering during the winter months.

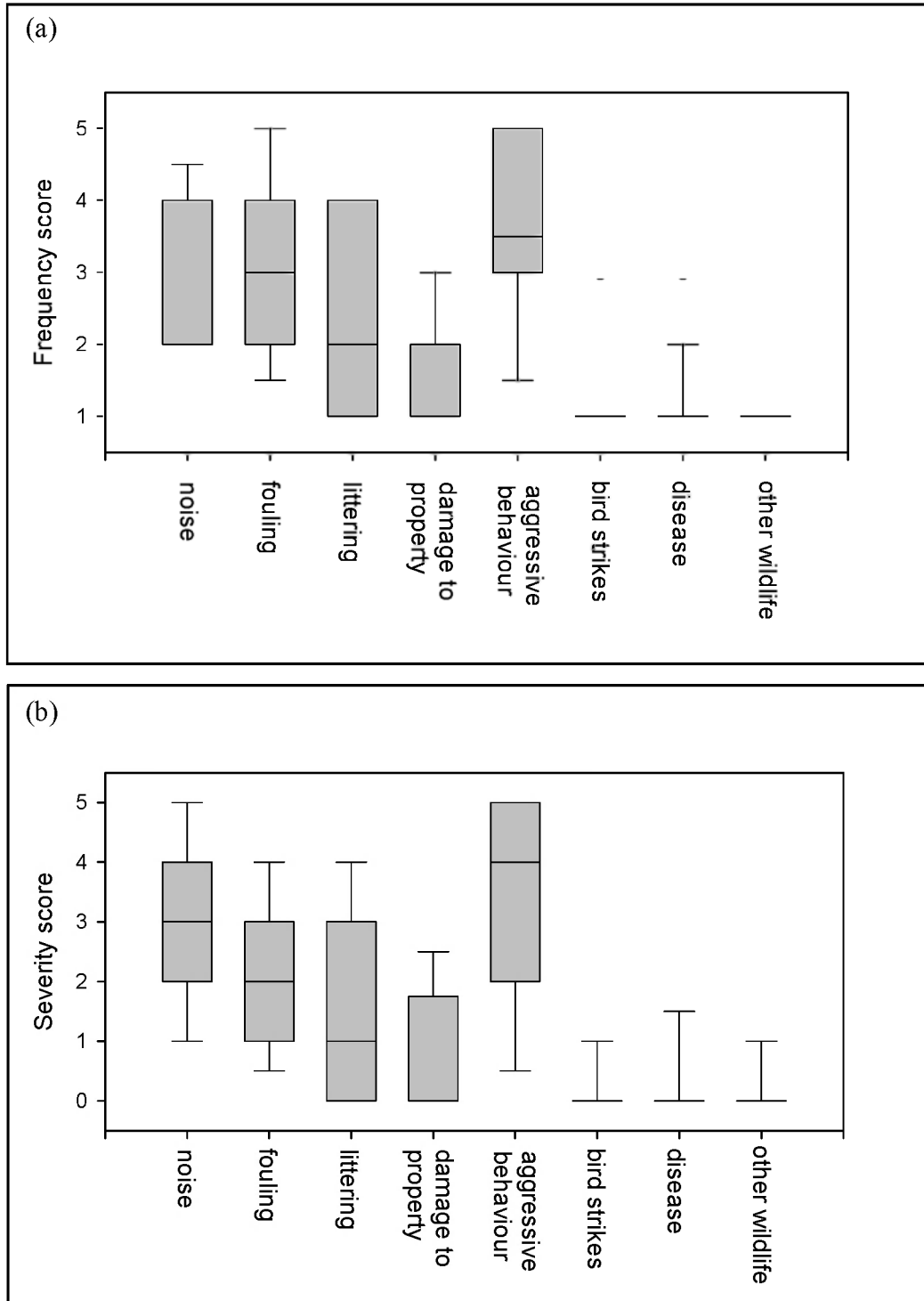


Figure 3.2

The average (median) and range of scores for each potential problem associated with urban gulls in terms of (a) frequency and (b) severity. The lower and upper boundaries of the boxes are the 25th and 75th percentiles respectively. The error bars above and below the boxes indicate the 90th and 10th percentiles.

Most Local Authorities that reported problems with urban gulls felt that the problems had increased over the last 10 years, reflecting the local increases in gull population size (Section 3.2 above). When asked what factors they thought had led to any that changes they perceived in numbers of urban gulls and any associated problems in their areas, the replies of the Local Authorities could be split broadly into (i) changes in food availability (*e.g.* reduced fishing activity at traditional nesting/feeding grounds, people feeding gulls, littering and poor waste storage, availability of landfill sites) and (ii) changes in the availability of nest sites, such that some urban sites provide very suitable nest sites for gulls (*i.e.* secure from predators, warm, sheltered and undisturbed by humans).

During further discussions with Local Authority representatives (Section 2.2), it became apparent that members of the public feeding gulls was a widespread activity and was felt by some to be a contributory factor in problems associated with urban gulls. Many participants also agreed that street litter had increased in recent years (*e.g.* from fast-food outlets and after-pub activities) and that this increased the amount of food available to gulls. In certain areas, such as Aberdeen and Dumfries, the opposite was felt to be true, however, due to extensive measures put in place by these Local Authorities to reduce litter on the streets. The only existing study of the foraging behaviour of urban gulls in Scotland suggests that in Dumfries the majority of the urban-nesting Lesser Black-backed Gulls forage outside the urban area (see Section 5.5), and hence that the availability of suitable nesting sites is believed to be an important factor for attracting and retaining gulls in Dumfries.

Fifteen of the 25 Local Authorities reporting gull problems said that they had a system for monitoring and collating data on complaints in relation to urban gulls, and some can provide counts to support their assertion that complaints have risen (*e.g.* Dundee City Council).

3.4 Mitigation methods used by Local Authorities and perceived effectiveness

A diverse array of techniques has been used to try to reduce problems associated with urban gulls (these, and any existing scientific evidence for their effectiveness, are reviewed in Chapter 6). Respondents to our questionnaire were asked to select from a list of possible mitigation measures (i) which, if any, the Local Authority used currently in an attempt to control gull numbers, (ii) any that it had tried previously, and (iii) of the methods of which it had direct experience, which, if any, were felt to be effective (Table 3.3). They were also provided with space to detail any other techniques that they used that were not on the list provided.

The two forms of mitigation used most commonly by Local Authorities currently are egg/nest removal and the proofing of buildings through netting (Table 3.3). Several Local Authorities carry out proofing and nest removal on Council-owned buildings because of obligations under health and safety at work legislation but state that they have no statutory obligation or budget to pay for these activities on privately owned buildings. The costs of any proofing and nest-removal work are incurred by the private owners of individual buildings. Some Local Authorities give advice on this (*e.g.* South Ayrshire: <http://www.south-ayrshire.gov.uk/environmentalhealth/pc-gulls.htm>; see also remarks on local guidance in Chapter 8) or refer enquiries of this nature to specialist

companies that carry out gull control work. Borders LA previously ran a scheme to provide 90% grants to building owners to proof their houses against gulls but found that the take up was very low (D. Watney, pers. comm.). In response to rising numbers of complaints about gulls from members of the public, in 2004 Cardiff City Council approved a proposal to provide an 'egg sterilisation service', whereby the Council would undertake the oiling of gull eggs for a fee (providing that certain conditions were met). The documents relating to this proposal and discussions therein are available at:

1. http://www.cardiff.gov.uk/Government/english/Cabinet_Papers/04_01_08_Cab/Reports/publiccab8Jan04Roof%20Nesting%20Gulls%20in%20Cardiff.pdf
2. http://www.cardiff.gov.uk/government/english/council_papers/Environmental_Scrutiny/04_02_02_env/Reports/Gull_Call_In_covering_report.pdf
3. <http://www.cardiff.gov.uk/scrutiny/pdf/gulls.pdf>
4. http://www.cardiff.gov.uk/government/english/council_papers/Environmental_Scrutiny/04_03_16_env/Reports/gulls.pdf

Bath & North East Somerset also have an ongoing experimental egg oiling programme, which is available to owners of properties with large, flat, accessible roofs, and is aimed at reducing gull activity, the associated noise and aggressive behaviour, and, potentially, the number of birds (see <http://www.bathnes.gov.uk/BathNES/environment/animalsandpests/Pests/Gulls.htm>).

Table 3.3 Mitigation techniques that have been used by Scottish Local Authorities to try to reduce problems associated with urban gulls. Local Authorities were asked to tick those methods that they used currently (column 2) or had tried previously (column 3). Eighteen Local Authorities also indicated the methods that they felt to be effective from those that they use currently or had used previously. Note that no supporting data was provided to underpin perceptions of effectiveness. Aberdeen City Council also included the production of a leaflet to deter the public from feeding gulls and felt that this could be effective (see http://www.aberdeencity.gov.uk/acc_data/publication/gulls%20a5.pdf).

Technique	Used currently	Tried previously but rejected	Perceived as effective
<i>Lethal control of adults/chicks</i>	3	4	3
<i>Egg/nest destruction</i>			
Nest and/or egg removal	11	4	10
Egg oiling	2	1	3
Egg substitution	0	0	-
Egg pricking	0	5	-
<i>Prevention techniques</i>			
Proofing of nesting sites	8	4	5
Broadcasting calls	3	3	1
Falconry (live birds of prey)	5	5	4
Plastic/stuffed birds (effigies)	0	5	-
Springs and wires	5	1	2
Mechanical scarers	3	5	-

Egg/nest removal and the proofing of buildings were also the measures that were thought to be effective in reducing the problems associated with urban gulls by the largest numbers of Local Authorities, although none have rigorous counts of gulls to support these perceptions. However, it was agreed during discussions that whilst proofing a particular building can be very effective in preventing nesting on that building, it may result in the problem simply being moved elsewhere. It was also agreed that whilst nest and egg removal can be effective at reducing specific problems associated with aggressive behaviour, and can reduce nesting gull numbers within particular areas, this technique requires long-term commitment, as gull numbers are likely to increase again if nest and egg removal is abandoned (see also Section 6.4). Roof 'wires' and other similar forms of deterrent (*e.g.* springs and wires in Table 3.3) were only considered effective by two Local Authorities, but it was noted during discussions that their effectiveness is very dependent on their detailed design and positioning, and that these need to be carried out by appropriately trained staff: in some cases, it may appear that a particular method has not been effective but this observed outcome may actually be due to incorrect application of the technique.

Although falconry using live birds of prey was included in the questionnaire survey as a single category of mitigation technique, it became clear during subsequent discussions with Local Authorities and falconers that large differences exist between the different bird of prey species (or hybrids) that can be used in different situations and this is likely to determine the effectiveness or not of this technique (see Section 6.1.2).

During discussions of mitigation options with Local Authorities, it was acknowledged widely that some pest control firms carrying out such work are better than others in the view of those that have experience of their work. It was suggested that training programmes to pass on best practice to those involved in the hands-on control would be beneficial.

Local Authorities based their appraisal of the effectiveness of the mitigation techniques largely on the general perception of the respondent (15 LAs) or reductions in the number of complaints (13 LAs), although reductions in the numbers of gulls counted were also used by some (9 LAs). The counts that were carried out do not necessarily constitute the type of monitoring that might be required for a rigorous test of the effectiveness of the different methods (see Chapter 8), however, as they may be focussed on very specific areas (*i.e.* one or two buildings) and may provide only a measure of the short-term effect of mitigation only. Five Local Authorities used one of these criteria (mainly perception) for assessing effectiveness but most (15 LAs) used at least two of these criteria. Local Authority representatives kindly provided us with the contact details for several external contractors with experience in gull control and/or preventative methods. As far as possible, these contacts were followed up in order to determine whether more detailed information on the effectiveness of particular techniques was available. Although we received useful qualitative information from these contacts on application of certain techniques and the problems associated with them, these consultations revealed little documented evidence of the effectiveness or otherwise of the different techniques (see Chapter 6).

Respondents to the survey were asked to indicate the factors that had influenced their Local Authority's choice of mitigation technique(s). We provided a list of possible

factors and asked respondents to rank the importance of each factor from 1 to 5 (where 1 = not important to 5 = very important; Table 3.4). Respondents were also able to supply any additional criteria that influenced choice in a text box.

Table 3.4 Average rankings (from a possible range of 1 to 5) attributed the criteria used to select techniques to mitigate against urban gull problems by the 15 Scottish Local Authorities that provided a response. Additionally, two Local Authorities gave the safety of staff carrying out any mitigation work a ranking of 5, and one Local Authority gave the “manpower required to carry out the work” a ranking of 3.

Factor	Average (median) ranking (25% and 75% percentiles)
Perceived effectiveness	5 (5, 5)
Licensing requirements	5 (2, 5)
Cost	4 (3, 5)
Ease of application	4 (3, 4)

All of the possible factors that were listed in the questionnaire were considered important by Scottish Local Authorities, with effectiveness and licensing requirements receiving the highest score (Table 3.4).

3.5 Waste strategies

Respondents to the survey were asked whether the current waste strategy employed by their Local Authority contained measures that might help reduce problems associated with urban gulls. A total of 21 Local Authorities answered this question. The use of wheelie bins or other refuse protection was cited by 15 Local Authorities, as well as proofing and/or gull deterrents at landfill sites (10 LAs), the use of gull-proof litter bins (6 LAs), education and enforcement measures such as the production of “no gull feeding” leaflets and litter wardens (5 LAs), and improved refuse storage at storage and transfer stations (4 LAs).

During subsequent discussions (Section 2.2), there was a lack of consensus over whether the introduction of wheelie bins had reduced urban gull problems. Whilst some Local Authority representatives felt that the introduction of wheelie bins had helped reduce gull problems in their area, other areas were cited where wheelie bins were introduced 15 years ago but urban gull problems had still increased. The baling of waste at landfill sites was also thought to have reduced the numbers of gulls at a number of sites around Glasgow (I. Gibson, pers. comm.), and some landfill sites now cover waste with topsoil at the end of each day to try to reduce the numbers of foraging gulls.

3.6 Legislation and powers

A total of 15 Scottish Local Authorities provided responses to the questionnaire that included information on how they felt that legislation could be introduced,

strengthened and/or clarified to allow them to reduce the problems associated with urban gulls. These can be summarised under the following five broad categories:

- *Clarification of the Wildlife & Countryside Act 1981*
Although there is a General Licence available in Scotland for the removal of some gull species and their nests in the interests of public health and safety (Chapter 7), each user must satisfy the licence requirements that there is a threat to public health and safety and that all other possible solutions have been tried. Differences in the interpretation of what constitute risks to public health and safety, mean that some Local Authorities are very cautious in their interpretation and conduct no gull control work that requires licensing, while others interpret the Act more liberally. During discussions held as part of this project (Section 2.2), it was explained by the Scottish Executive that the European Union (EU) will not give Member States explicit guidance on interpretation of the EU law underpinning the national legislation that is in place (in this case, for example, the 1979 EU Birds Directive, see Chapter 7) but rather takes the approach of following up any cases in which it is felt that the legislation is used in an inappropriate manner. The Scottish Executive (in common with all similar such bodies) is therefore in a difficult position in respect of the level of guidance that can be offered regarding interpretation of the legislation (e.g. to a Local Authority).
- *Extension of the Wildlife & Countryside Act 1981*
Given the lack of consensus over what constitutes a risk to “public health and safety” (see section 7.4), many respondents wanted to see the problems associated with urban gulls, such as noise, fouling and damage to property specifically given as a valid reason to control within the conditions of the General Licence (note that this would require a change to the underpinning EU legislation that allows derogations for certain specific purposes; see section 7.1).
- *Ability to enforce nest removal/proofing of buildings/new building designs*
As nest removal and the proofing of buildings may result in gulls simply moving to other buildings, several respondents suggested that, within particular problem areas, Local Authorities should have the power to force property owners to proof buildings or remove nests. If owners were unwilling to organise this themselves, they felt that appropriate powers should be available to allow the Local Authority to gain access, carry out the appropriate work and charge the costs to the owners. During follow up discussions it was recognised that there might be difficulties in enforcing any such powers however (e.g. due to access issues, Health & Safety considerations for Local Authority staff, risks of damage costs). Some Local Authorities also sought clarification on whether enforcement of gull-proofing on new buildings under planning legislation is permissible (see section 7.3).
- *Ability to deal with persistent bird feeders*
In some Local Authority areas, there are clearly particular individuals that are well-known to Local Authority staff, who feed very large amounts of food that attracts large numbers of birds, such as gulls and pigeons, and also rats and other potential pests. This was raised by several Local Authorities in their

responses to the survey and was followed by more detailed discussions during consultations (Section 2.2). There were differing opinions expressed as to how those members of the public who feed gulls (and other birds) persistently should be dealt with (*i.e.* persuasion via personal contact and ‘education’, leaflet campaigns, or the need for legal enforcement). Some participants felt that in their area, personal persuasion and the production of “no feeding” leaflets had reduced the numbers of persistent feeders, whilst others felt that such strategies had little or no effect and that enforcement measures were required.

- *Reduction of legal protection for gulls*
Few Local Authority representatives advocated that a wide-scale cull of gulls was required in Scotland (a couple did, and some consultees suggested that a national ‘strategy’ for dealing with urban gull problems would be useful). There was concern expressed by a few respondents, however, at the level of legal protection afforded to gulls in Scotland. Some felt that the legislation, as it stands currently, is out of date, given the recent observed changes in gull populations and the behaviour of gulls in urban areas.

Local authorities are empowered to make byelaws (subject to Scottish Ministers' consent) for the prevention and suppression of any nuisances, and in response to particular local needs. In the survey, respondents were asked whether their Local Authority had introduced any byelaws in response to urban gull problems. No Local Authority has done so, however, and later discussions indicated that Local Authority representatives felt that byelaws should be used to deal with very specific problems, whereas they felt that the problems caused by urban gulls were sufficiently widespread to warrant a national-scale legislative approach.

3.7 Other suggestions from Local Authorities regarding solutions

Some consultees at the open meeting (Section 2.2) felt that a national campaign to educate the public about gulls in urban areas would be beneficial. This could include information on problems associated with littering, why excessive feeding in public places is not beneficial (to gulls, humans and other biodiversity interests) and explanation of some relevant gull behaviour, such as why gulls are aggressive during the breeding season. It was felt by some that if the public understood the issues better, they might take a more responsible approach in urban areas. Few consultees seemed to indicate that this was a bad idea but the majority appeared to be of the opinion that such a campaign would only be successful in mitigating urban gull problems if used in conjunction with direct control of some form.

Several Local Authorities mentioned that they require targeted financial assistance to allow them to carry out gull control work themselves or persuade private individuals (*e.g.* home-owners, businesses) to do the work, including the proofing of buildings.

3.8 Gull mitigation measures undertaken by Wellpark Action Group

As part of the current project, we visited two members of Wellpark Action Group, a group of residents from a housing estate in Kilmarnock who had got together to take action against perceived urban gull problems in a way that they feel has been successful for them. This section gives a short description of the Wellpark project, as an example of the way in which a local community has dealt with a colony of gulls that was perceived as a problem to residents.

In 2002, breeding Lesser Black-backed Gulls became perceived as a problem on the Wellpark residential estate in Kilmarnock because they were showing aggressive behaviour directed at vulnerable elderly people, people on motorbikes and even dogs (Iain Boyd and Jane Overton, Wellpark Action Group, pers. comm.). Noise (particularly before dawn) was also a problem for residents, as were the copious gull droppings on cars and other possessions. The Wellpark Action Group (WAG) already existed (formed previously to address traffic problems on the estate) and the members decided to reform in an attempt to tackle the perceived gull problems. The residents of the estate were accused by some of leaving litter around the estate that was attracting the gulls but the residents felt that the estate was not littered and the nearest fast food outlets were more than a quarter of a mile away. WAG feel that their estate was favoured by the gulls because of its location on a hill, with views over the surrounding landscape and exposure to the prevailing south-westerly winds. The houses are also of a style that the gulls seem to like: with chimney 'valleys' in which the nests can be built. Gulls have nested both on two-story houses and bungalows within the estate. Within the Kilmarnock area, there are other breeding gulls on some estates (these also tend to be the ones on hills overlooking the town; WAG pers. comm.) and on flat roofs (disused factories by the river and on the Council buildings (an old school). Milton landfill site (about 2-3 miles away up the Irvine Valley towards Galston) closed three to four years ago, which may have reduced the food available for the gulls there. The other tip locally is at Stewarton (six to seven miles away). WAG believe that food refuse on the streets in Kilmarnock has got worse, particularly from school children and late-night pub-goers. They feel that there is the need for a school education campaign.

WAG tried to arrange the use of a falconer with a hawk but an insufficient number of residents would 'buy in' and the Council's position was that the residents were owner-occupiers and should therefore fund any action themselves. WAG also tried the use of plastic owls and found that they had no effect at all. Hence WAG sorted out details of pest control contractors and made their cards available to all relevant residents, suggesting that they got him to remove nests/eggs and place deterrent flexible plastic spikes on the roofs. Spikes were put in place in 2003 on most affected houses (approximate cost for a pair of semi-detached houses was £90-100 for nest removal and proofing work). WAG has observed that the spikes have not been successful in all cases and must be placed in specific areas around chimneys and on the apex of some roofs. Now about one-fifth of houses have proofing (spikes) on key nesting places. The work that has been carried out appears to have broken the cycle of breeding success and recruitment on the estate, however, such that the numbers of breeding gulls there have been substantially reduced (WAG, pers. comm.).

The action taken by WAG appears to have been successful in reducing the problems associated with breeding urban gulls in the particular context of that specific residential area, although WAG acknowledge the fact that the gulls will have moved away to breed and potentially cause similar perceived problems elsewhere. Residents of the estate are now waiting to see whether the effects of their action will be sufficient to deter gulls from breeding on the estate in the longer-term (J. Overton, pers. comm.).

3.9 Costs of urban gull problems to Local Authorities

Respondents to our questionnaire survey were asked about the expenditure of their Local Authority on problems associated with urban gulls. No quantitative estimates of overall expenditure were provided (Scottish Borders Council stated that their annual egg oiling programme cost c.£1000). It was noted during subsequent discussions with Local Authority representatives that very few Local Authorities allocate a discrete budget specifically for gull control work, tasks relating to perceived gull problems (e.g. cleaning, pest control, advice etc) were often split between different council departments, and some of the actions taken were not necessarily solely to remedy gull problems, such that providing estimates of overall expenditure is currently difficult for most Local Authorities.

4 Numbers, trends in numbers and status of gulls in Scotland

This chapter provides a review of our current knowledge of the numbers, temporal changes in numbers (trends) and status of the gull species that occur commonly and in abundance in Scotland and are known to occur in urban habitats. Following some background information on the general ecology of gulls during and outside the breeding season, we describe the sources of survey information on urban gull numbers that are available and their limitations. For each of the key gull species, we provide details as far as is known of their overall Scottish population size, trends and status, and then specific information on size and trends in numbers in urban areas of Scotland.

4.1 Background ecology and sources of information

Six species of gull occur in Scotland that are either common or abundant (Black-headed Gull, Common Gull, Great Black-backed Gull, Herring Gull, Kittiwake and Lesser Black-backed Gull) and all six have been recorded as occurring within built environments. All tend to breed colonially and to forage and roost communally. Both breeding colonies and roosts are often, though not exclusively, in mixed species groups. All species are opportunist feeders that have apparently been able to capitalise on increased food availability through fishery discards and, with the exception of the Kittiwake, all are generalist feeders that readily take a wide range of edible discards, for example at garbage tips or other waste (Furness & Monaghan 1987).

4.1.1 Breeding season

General ecology

Breeding populations of most species of gull generally increased during the 20th Century in Britain, largely in response to increased protection and food supply (Cramp & Simmons 1983).

Apart from the Kittiwake that feeds mostly at sea, including on fishery discards, all gulls that breed in Britain can forage within a range of habitats including agricultural land, coasts and estuaries including intertidal areas, at sea (including use of fishery discards), garbage tips and other areas where edible refuse is discarded, although preferences and foraging ranges vary between species (e.g. Mudge & Ferns 1982, Furness & Monaghan 1987). As with all birds, their breeding distribution is limited to areas where there are both (i) suitable, secure nesting areas and (ii) suitable available food within a foraging range that does not normally put either the birds or their breeding attempts at risk. A secure nest site for a gull is generally one that is relatively inaccessible to ground predators, or where ground predators are scarce, for example on islands, cliffs, marshes, some moorland, peninsulas and sand dunes, and also on some buildings (e.g. Cramp & Simmons 1983, Mitchell *et al.* 2004). All gull species normally take at least two years to attain breeding age, with the larger species (Herring, Lesser Black-backed and Great Black-backed Gulls) typically not breeding until at least their fourth calendar year and sometimes until much later (Chabrzyk & Coulson 1976; Coulson *et al.* 1982; Cramp & Simmons 1983). Even after having recruited into the breeding population, a proportion of adult gulls do not breed every

year (Calladine & Harris 1997, O'Connell *et al.* 1997) and thus, along with the immature cohorts, there will always be individual birds that are not 'attached' to breeding areas even during the breeding season.

Surveys, survey methods and limitations

Three extensive surveys have attempted comprehensive coverage of all coastal breeding seabirds, including gulls, in Britain and Ireland: 'Operation Seafarer' during 1969-70 (Cramp *et al.* 1974); the 'Seabird Colony Register' in 1985-88 (Lloyd *et al.* 1991); and 'Seabird 2000' in 1998-2002 (Mitchell *et al.* 2004); hence, recent population trends for each species within Scotland are reasonably well known. The most recent census, 'Seabird 2000' (1998-2002), was the first to attempt comprehensive coverage of all colonies, including those inland and in urban areas, although some inland and urban colonies were included in earlier surveys. In addition to the three national seabird surveys above, there have been two specific surveys of urban or roof-nesting gulls: one in 1976 (Monaghan & Coulson 1977) and one in 1994 (Raven & Coulson 1997). Operation Seafarer (Cramp 1971, Cramp *et al.* 1974) and the Seabird Colony Register (Lloyd *et al.* 1991) included surveys of some roof-nesting and urban gulls, in 1969-70 and 1985-88 respectively, but the two specific surveys in 1976 and 1994 provided information supplementary to that collected during the respective preceding and more extensive surveys. For this review, assessments of trends and current breeding numbers are based largely on the 1974 and 1994 specific surveys and the extensive survey of breeding seabirds undertaken in 1998-2002 ('Seabird 2000', Mitchell *et al.* 2004). Supporting information has been added from other local surveys (e.g. counts provided in the Scottish Bird Reports or local bird reports) and that provided directly by Local Authority representatives (see Chapter 3).

The 1969-70, 1976 and 1994 surveys were confined to gulls nesting on buildings or other man-made structures frequented by people. They were not comprehensive surveys of gulls nesting in urban areas, in that birds on natural sites (e.g. cliffs or wetlands) within urban areas were excluded. The aim of those surveys was to quantify the habit of roof nesting rather than the total numbers of urban gulls. Seabird 2000 (1998-2002) aimed to survey all colonies of breeding gulls, and obtain habitat details, including whether birds were nesting on buildings frequented by people, were recorded. Seabird 2000 also recorded whether the colonies were in urban or rural areas. The definition of an area as 'urban' is somewhat subjective, however, and nesting on buildings in rural areas may also 'impact' on humans. Hence, for this review, we consider the distribution of all gulls reported as nesting within urban areas and as on buildings, regardless of location. Areas defined as 'urban' by JNCC for Seabird 2000 are shown in Figure 4.1a, while the distribution of all nesting gulls recorded on buildings is shown in Figure 4.1b. In some gull colonies that have been recorded as 'natural' sites, some nesting will occur on derelict or abandoned and unoccupied buildings. For example, many Herring and Lesser Black-backed Gulls nest on, among, and even in the derelict buildings on the island of Inchkeith in the Firth of Forth (pers. obs., see also plate on page 238 in Mitchell *et al.* 2004). Such colonies have not been included as 'urban' or 'roof-nesting' in the current review.

All the major surveys of gulls undertaken to date have relied predominantly on fieldwork by volunteer surveyors; written instructions were provided and surveys were coordinated by regional organisers with local knowledge of both the birds within

their areas and also of the individuals undertaking the survey work. The latter will have assisted in improving the thoroughness of coverage and also the accuracy of counts. Inevitably, however, survey methods for all breeding seabirds have progressed over the 30 years that counts of urban gulls have been made, including the publication of a specific manual to provide guidance on seabird monitoring techniques (Walsh *et al.* 1995). Any apparent population increases and range expansions therefore need to be considered against a background of improving knowledge of where gull colonies are located and of suitable field survey techniques.

During seabird 2000, five methods were recommended for counting breeding gulls (Mitchell *et al.* 2004). These were:

1. Counts from vantage points;
2. Sample quadrat counts;
3. Transect counts;
4. Flush-counts of adults;
5. Aerial counts.

Relevant details of these counting methods have been provided in the following sections where they are required to explain the specific limitations of the data collected on urban gulls. Counting breeding gulls can be difficult. Outwith the difficulties of applying any given counting technique in a given context, there are frequently additional issues to address, such as the need to carry out validation studies to allow determination of the proportions of different species present where gulls occur in mixed colonies.

All the national surveys have attempted to provide estimates of the numbers of gulls breeding in each colony. With few exceptions, each colony count provides a best estimate of the number of AONs (based on counts of nests or of individual adult birds), generally with no associated measure of the precision for these estimates. This is because the confidence limits attached to any population estimate must be generated via a sampling approach during counting. Colonial birds, with an extremely heterogeneous distribution (*i.e.* large numbers in relatively few places) do not lend themselves easily to such a sampling approach at a national level, although this rigorous statistical approach has been possible within some larger colonies. Current national and regional estimates of gull populations are therefore necessarily the sum of the 'best' estimates for each colony and, as such, contain a sum of the biases associated with all the component individual colony estimates.

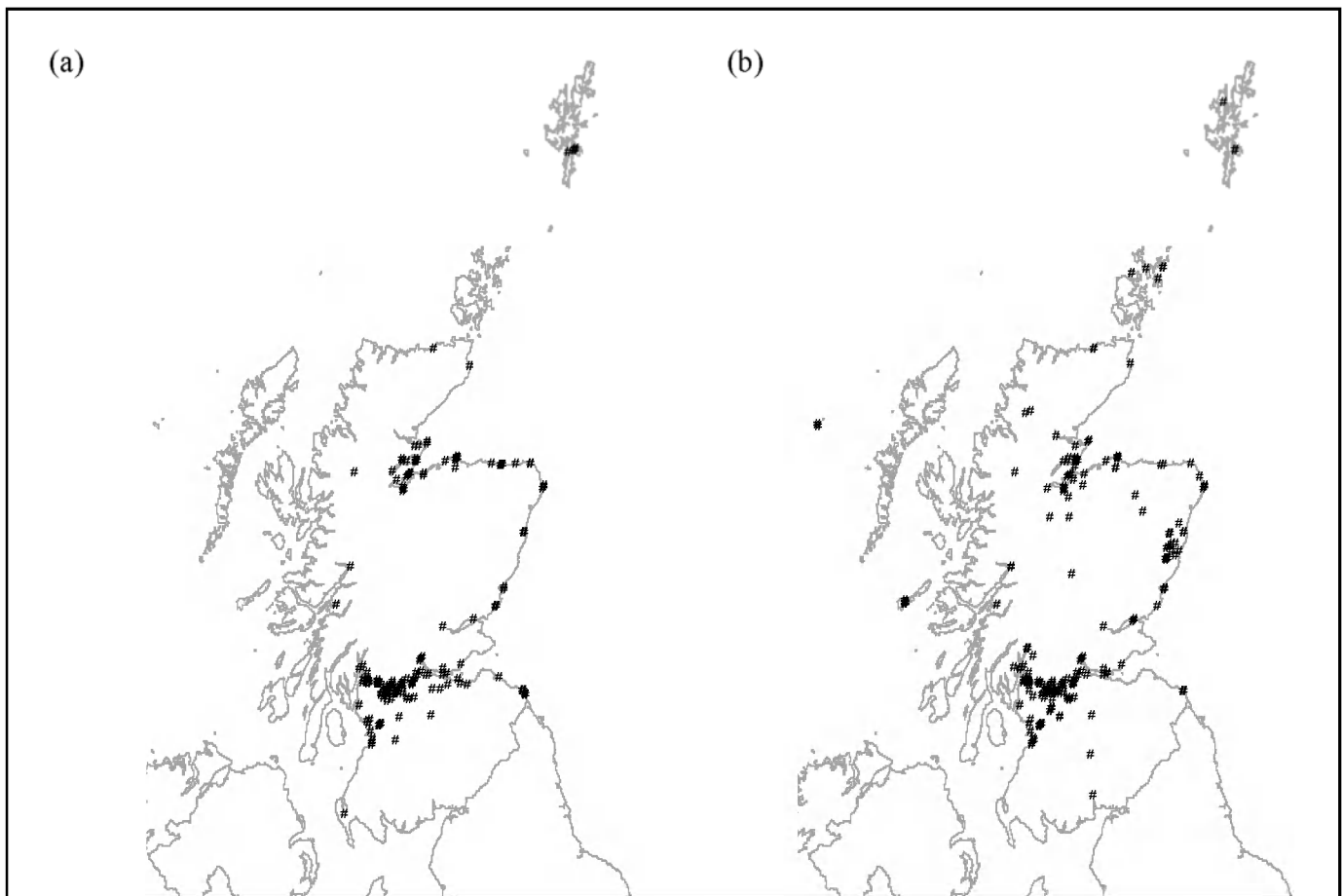


Figure 4.1

(a) Gull colonies recorded during 'Seabird 2000' and classed as within urban areas (Source: JNCC).

(b) Gull colonies in Scotland recorded during 'Seabird 2000' or during two roof-nesting gull surveys (1976 and 1994) and classed as nesting on buildings (Source: JNCC)

Missing and negative data

Some urban gull colonies have been reported elsewhere, so that they are known to have been omitted from the 1998-2002 survey (*e.g.* Lesser Black-backed Gulls in Edinburgh; Holling 1991, Dott 1994 and previous reports, Calladine 2004). The most recent attempt at a full count of Edinburgh and its surrounds was undertaken in 1994 (Dott 1994); a further attempt to update the results from 1994 is being made during the 2005 breeding season (M. Holling, pers. comm.). The overall extent to which the Seabird 2000 survey missed some extant urban gull colonies is difficult to assess however. Local surveys of roof-nesting gulls report between 250-435 nests (mostly of Lesser Black-backed Gulls but also some Herring Gulls) in Dumfries (Coulson & Coulson 1999-2003), concurrent with, but not reported in the JNCC Seabird 2000 database.

Only two Local Authorities (Aberdeenshire Council and Dundee City Council) raised queries over counts of breeding urban gulls recorded during the Seabird 2000 survey. In the case of Dundee, the Seabird 2000 survey appeared to have underestimated the numbers that the council believed are now present within the City boundary. Further investigation, including consultation with the observer who provided the Seabird 2000 counts, has suggested that a mixture of factors might be responsible for the apparent discrepancy, including: recent changes to the characteristics of one of the sites (rendering counting somewhat easier in the years following the Seabird 2000 survey); an area containing breeding gulls in the docks possibly missed during the Seabird 2000 counts; differences in the count units used by Seabird 2000 observers and Council staff (*i.e.* breeding pairs versus total counts of all individuals including non-breeders); and possibly also a real increase in numbers (M. Nicoll, pers. comm.). Unfortunately, the confounding factors make it difficult to assess whether any recent change in numbers has actually occurred. In the case of Aberdeenshire, it is felt that the Seabird 2000 estimate is too low based on the Council's own counts of nests that have been removed from Council-owned properties (C. Campbell, pers. comm.).

JNCC provided us with details of some counts of urban and roof-nesting gulls in addition to those collated for the three national surveys. Any duplicates with the principal databases were removed when we collated this data to provide the population estimates presented in the current report. Of the remaining counts, for purposes of this review, those for roof nesting gulls made between 1990 and 1996 inclusive were added to those for the 1993-95 survey and those from 1997-98 were added to the 1998-2002 survey.

The specific surveys of roof nesting gulls in 1976 and 1994 both collated past records and circulated requests for information on the locations of colonies, including negative counts. The latter provide a sounder basis for determining whether colonies detected only in later surveys were newly established or simply were not counted previously, but unfortunately the reporting of such negative counts was not comprehensive (Monaghan & Coulson 1977); in addition, negative counts that were reported (*i.e.* no breeding gulls present in a given geographical area) may have been unreliable in some cases (*i.e.* the area in question was not checked by the respondent). Observed increases in breeding gull numbers between these two specific surveys may be overestimated if colonies were unknown or unreported during the earlier one.

Timing of counts

The timing of survey work for the 1976 survey is not reported. For the 1994 and 1999-2002 surveys, observers were asked to undertake counts between mid-May and early June (Raven & Coulson 1997, Mitchell *et al.* 2004) to coincide with the period when the maximum number of nests is expected to be occupied (Wanless & Harris 1984). The actual dates when surveyors counted breeding gulls are not available for either the 1976 or 1994 surveys. For the 1998-2002 survey, however, the count date is known for 73% of the counted AONs of all gulls in urban or man-made areas. Of these, just 29% were within, or close to the optimum period (JNCC data). Based on what is known about the influence of the timing of counts on estimated breeding numbers at natural colonies, the most recent estimates of urban gull breeding numbers would be expected to be underestimates. The extent to which this is the case is unknown, however. In fact, counts that fall later than the optimum window for counting might cause less bias to estimates in urban than in natural gull colonies because of the generally higher breeding success at urban sites (such that few pairs might fail before late counts were made, see Section 5.2). However, an additional problem related specifically to urban-nesting gulls is the extent to which some nests may have been removed by residents in urban areas before counts were made starting in May: for example, in some areas where specific counts of urban-nesting gulls have been made, 10-15% of nests had been removed by the end of May, when many counts would generally be made (J. Coulson, pers. comm.). In the absence of studies of the breeding phenology and success of urban gulls in Scotland, it is not possible to make further suggestion as to the extent, if any, to which current numbers are underestimated.

Visibility of nests

Gulls nest on a variety of substrates and even where nesting on roofs, the extent to which nesting areas are visible can be variable. Nests on the roofs of buildings are rarely visible from ground level and suitable vantage points, for example taller buildings, are not always available (*e.g.* Monaghan & Coulson 1977). The roofs and buildings on which gulls nest can be complex structures and some nests (including their attending birds) may be undercover or otherwise concealed. Once again, such problems will lead to some counts being underestimates. Of all the AONs of gulls counted in urban and man-made sites in Scotland during 1998-2002, 78% were made from vantage points and hence could be underestimates, again by an unknown amount (see below). A further 17% of all the AONs counted were from aerial surveys, for which no ground-truthing to check for nests that were not visible from the planes is documented.

Even where rooftops, or other sites where gulls are nesting are accessible directly and visibility is good, accurate counting can be difficult. Even experienced counters miss some nests (Ferns & Mudge 1981, Wanless & Harris 1984), and appropriate correction factors will not always have been determined and applied, to account for the missed proportions. Only 3% of the AONs counted in urban and man made sites were counted from the ground rather than from vantage points or planes however, most of those involving scanning generally vertical parts of buildings and other structures (JNCC data).

Outside of Scotland, in the Bristol area, one worker on urban gulls used a combination of counts of adult birds (assessed by plumage characteristics) and AONs to estimate

the size of local breeding colonies, using additional correction factors (of between 5% and 25% depending on roof structure) to account for missed nests (Rock in prep.). Rock's study considers the data reported by Seabird 2000 for that area to underestimate breeding gull numbers by around 60%, through a combination of undercounting at individual colonies and also missing sites. The full methods used in this study were not available for us to assess directly here, however, and it is likely that no systematic validation of the correction factors used has been undertaken. Assuming that counts of birds and of nests can be correctly associated using validated correction factors, then such an approach can lead to a more accurate estimate of colony size. It follows that at least some counts of urban gull colonies in Scotland may be serious underestimates but there are no appropriate validation studies to allow further assessment of the extent of this problem. A comparable discrepancy is also found between Seabird 2000 data for roof-nesting gulls in Lerwick, Shetland and a more intensive census (Okill 2004), although the latter survey was undertaken one year later than the former so that a direct comparison may not be valid. If counts that involve correction factors to account for less than full visibility of nests are to be compared through time, then it is important that the criteria on which the correction factors are based are carefully documented. Assessment should also be made of whether the correction factors change through time (*e.g.* as could occur if numbers increase and areas of the colony that differ in character from the initial area become occupied).

Counts based on individual birds

At some gull colonies, counts have been made of attending adults, rather than of nests or nest sites (*e.g.* where nests are not visible but birds are). For Seabird 2000, such counts were systematically divided by two to give a count of AONs (Mitchell *et al.* 2004). Such correction approaches are biased according to variation in the actual attendance rates of adults at nests; less than 1% of all urban and roof nesting AONs in Scotland during Seabird 2000 were derived in this manner, however, so that the influence of such bias on overall estimates is negligible.

Assigning proportions to species in mixed colonies

In mixed colonies, the determination of the proportion of a count to assign to a particular species can provide a further potential source of error if counts are based on nests that cannot readily be identified as belonging to a particular species. As the majority of counts of urban gulls have been made from vantage points, most AONs will have been assigned to species by identification of the bird(s) in attendance. For the 17% that were counted by aerial survey during Seabird 2000, specific identification during the surveys, or from photographs, would have been difficult or impossible however. Recommended survey methods suggest that representative sample head counts are made to determine the proportion of each species present. The two species most likely to be involved are Herring Gull and Lesser Black-backed Gull. There are potential biases associated with differences in attendance rates at colonies between the two species, but at sites where these have been determined, the direction of bias (*i.e.* for Herring or for Lesser Black-backed) is confounding (Calladine 2004), such that the effect on survey estimates is unknown.

Derivation of trends

Although the methods of counting during earlier surveys of urban gulls are less precisely documented than for Seabird 2000, the majority of counts will have been

from vantage points (Monaghan & Coulson 1977, Raven & Coulson 1997). Although the actual counts are likely to have been underestimates in many cases (for reasons given above), where there have been subsequent counts for the same areas, comparisons to establish general trends should still be valid. Where different methods have been used, for example counts from vantage points in one survey and aerial counts in another, however, in the absence of any calibration of the two methods comparison should be made with caution. Aerial surveys were used only in the 1998-2002 survey and for only 17% of the total AONs counted, so that any effect on national trends should be relatively minor but more local trend information may be biased and should be treated with caution. For urban nesting gulls, counts from vantage points have been the principal method used during all three comprehensive seabird surveys and differences in counting methodologies are unlikely to be a major factor contributing to apparent changes in the numbers of breeding gulls in urban areas.

4.1.2 Outside the breeding season

General ecology

Outside of the breeding season, the requirement for secure nest sites is absent and gulls generally become more widespread. They still require secure roosting sites that are within range of suitable foraging areas. Gulls typically roost communally and often in mixed species groups. Roosting sites are normally on open water, including the sea in calm conditions, although some roosts and 'pre-roost gatherings' can be located on buildings. As birds are not tied to attending eggs or young at this time, wintering gulls are able to range more widely and will not necessarily use the same roosts and foraging areas throughout the non-breeding season. Hence, some individual gulls may make more transitory use of urban areas in winter.

Surveys, survey methods and limitations

A systematic survey due to be completed during winter 2005/06 aims to provide the first comprehensive estimate of gull numbers in Britain during winter, including a measure of the precision of that estimate (Burton *et al.* 2004). The general distribution of wintering gulls in Britain, including measures of relative abundance, was mapped for the three winters 1981/82 to 1983/84 (Lack 1986), and coordinated mid-winter counts at some larger roosts in Scotland have been made in 1983, 1993 and 2003 (Bowes *et al.* 1984, Burton *et al.* 2003, Burton *et al.* 2004). These latter surveys targeted major gull roosts, where over 1000 gulls were known or expected to congregate (Figure 4.2). Based on counts from 116 roosts in 1993, minimum mid-winter population estimates for Scotland have been produced (Burton *et al.* 2003) but the numbers of birds roosting away from those large roosts identified for the 1993 survey will not be known until completion of a survey of randomly selected tetrads (2km by 2km squares) in 2005/06 (Burton *et al.* 2004). The 2005/06 winter roost survey has not been designed to provide estimates of the numbers of gulls using urban areas in winter.

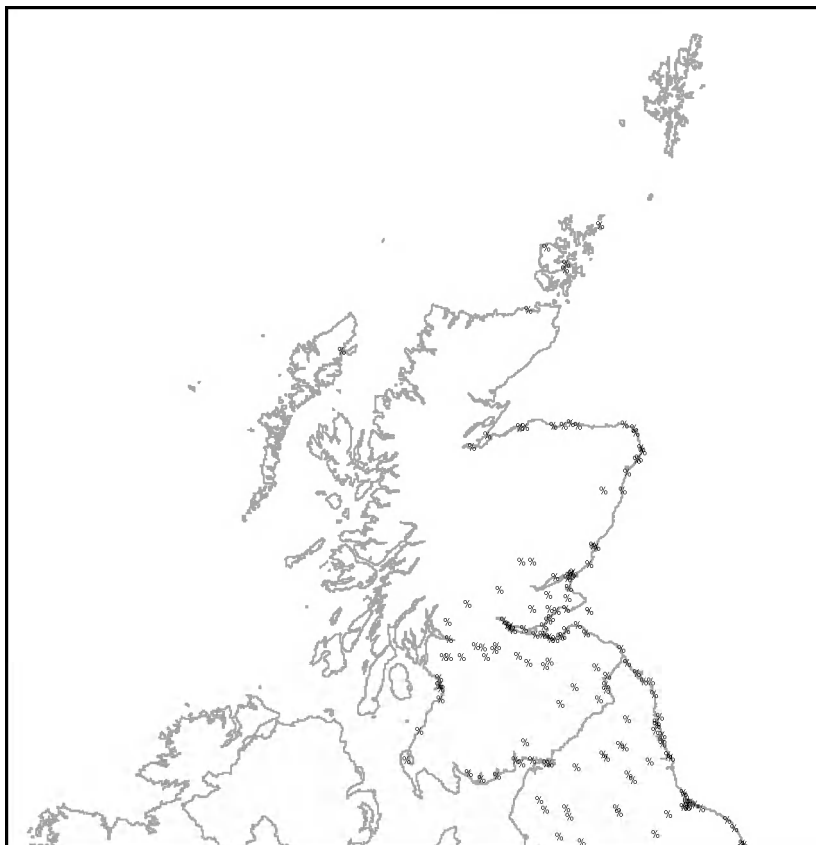


Figure 4.2

Key roosts targeted for the mid-winter surveys of roosting gulls in 1983, 1993 and 2004 (Source: BTO data).

Derivation of trends

Indices of change in the numbers of gulls wintering in Scotland have been produced already, based on counts from between 41 (for Lesser Black-backed Gull) and 112 (for Herring Gull) roosts that have been surveyed in more than one of the three coordinated mid-winter counts (Burton *et al.* 2004). Trends assessed from mid-winter counts of large roosts do not necessarily reflect trends in abundance within urban areas nor their abundance at other times outside of the breeding season. They should reflect broad trends in the numbers of gulls in Scotland at that time of year however. The distribution of roosts for which the trends have been derived to date are concentrated on the east coast, in the central belt and south-west Scotland (Figure 1). The winter trend information currently excludes some important areas for wintering gulls (all species except the Lesser Black-backed Gull), notably on the west coast, the Western Isles and in Shetland (Lack 1986) and, therefore, may not be representative of changes in the numbers of wintering gulls throughout Scotland.

4.1.3 Questionnaire survey

The questionnaire survey that was sent to every Local Authority in Scotland (Section 2.3 and Appendix 1) asked respondents for any information that they had on the size and trends in numbers in their areas, together with how any gulls were distributed spatially and details of the methods used to obtain any counts that they provided. The resulting information was used to compare with that obtained from the Joint Nature Conservation Committee from the 'Seabird 2000' survey and, alongside other more local information sources, was used to investigate any possible gaps in Seabird 2000 coverage. None of the counts provided as a result of the questionnaire survey provided detail of the numbers of gulls using urban areas in winter.

4.2 Species accounts

4.2.1 Black-headed Gull (*Larus ridibundus*)

The majority of Black-headed Gulls breeding in Scotland do so at inland sites. An estimated 43,191 apparently occupied nests (AONs) were counted in 1998-2002, most in the eastern half of the country (Dunn 2004). Earlier comparable counts are only available for coastal colonies, which represented 16% (6,888 AONs) of the total breeding population in 1998-2002; in 1998-2002, they showed a marked decline from 18,226 AONs in 1969-70 and 9,554 AONs in 1985-88 (Dunn 2004). The Black-headed Gull is currently on the Amber List of Birds of Conservation Concern in the UK, based on the moderate decline (25-49%) in its breeding population over the past 25 years (Gregory *et al.* 2002).

The numbers of Black-headed Gulls present in Scotland are boosted in the winter months with immigrants of mostly northern European breeding origins (Mackinnon & Coulson 1987; Fletcher 2002). In winter, the Scottish distribution of the species is concentrated along the east coast, in the central belt and around the Solway Firth and Firth of Clyde (Flegg 1986). The minimum number of Black-headed Gulls roosting in Scotland in January 1993 was 155,539 (Burton *et al.* 2003). Based on counts from 101 roosts for which more than one year of data were available, this represented an

increase of 26% since 1983, but there has been a subsequent decline of 66% between 1993 and 2004 (Burton *et al.* 2004).

Black-headed Gulls were excluded from the specific roof-nesting surveys of 1996 and 1994 and were not recorded during 1969 (Cramp 1971). During Seabird 2000 (1998-2002), nesting Black-headed Gulls were only reported in four areas defined as urban, City of Aberdeen (68 AONs), industrial site at Dyce (1050 AONs), Montrose (1 AON) and Hunterston (50 AONs). Other reported sites are defined as rural, although some of the 100 AONs were on buildings at Carstairs Junction, Clydesdale (defined as rural) (Table 4.1, Figure 4.3). Although Black-headed Gulls were excluded from the specific surveys of roof-nesting 'large gulls', as no mention is included in earlier reports (Monaghan & Coulson 1977, Raven & Coulson 1997), it is likely that the occurrence of this species nesting on roofs is truly relatively recent.

4.2.2 *Common Gull* (*Larus canus*)

The majority of breeding Common Gulls in Britain are found in Scotland, with an estimated 48,113 AONs counted during 1998-2002, about half of which breed inland and half on the coast and this species is possibly the most widespread gull in Scotland (Tasker 2004). The coastal portion of the breeding population was given as 20,467 AONs in 1998-2002, representing increases from 12,229 in 1969-70 and 15,134 in 1985-88 (Tasker 2004). The distribution of inland breeding Common Gulls has contracted over the same period, with marked declines at some large colonies in north-east Scotland (Tasker 2004). Based on the decline of the overall population, and also an 'unfavourable status' elsewhere in Europe, the Common Gull is currently on the Amber List of birds of Conservation Concern in the UK (Gregory *et al.* 2002).

As with Black-headed Gulls, numbers of Common Gulls are augmented in winter by birds of largely northern European breeding origins (Douse 2002). Although the species is still widespread in Scotland in winter, many areas in the Highlands are vacated (Vernon 1986). In January 1993, the minimum number of Common Gulls wintering in Scotland was 79,742 (Burton *et al.* 2003). Although there is some evidence of a decline between 1983 and 2004, the change is not statistically significant based on counts from 103 roosts with more than one year of count data (Burton *et al.* 2004).

A single nest of Common Gulls was reported on a building in 1969, at Dalcross Airport, Inverness (Cramp 1971) and none was reported during 1974-76 (Monaghan & Coulson 1977). Roof-nesting has occurred in Aberdeen since at least 1984 (Sullivan 1985) where, by 1993-95, 182 AONs were present (Table 4.2, Raven & Coulson 1997). The incidence of roof nesting has continued to increase and become more widespread (Table 4.2, Figure 4.4). By 1998-2002, the largest reported concentration of urban and roof-nesting Common Gulls was in Aberdeen, with 410 AONs (Table 4.2), including 280 AONs reported from the City centre and the rest on an industrial estate at Dyce. Over 50% of Common Gulls nesting on buildings were outside of areas classed as urban (Table 4.2), with some concentrations in industrial complexes on the periphery of urban areas (Tasker 2004). Roof nesting Common Gulls have not been reported in Britain and Ireland outside of Scotland (Tasker 2004).

4.2.3 Lesser Black-backed Gull (*Larus fuscus*)

During 1998-2002, 25,057 AONs of breeding Lesser Black-backed Gulls were estimated in Scotland, with concentrations in the Firths of Forth and Clyde and across the central belt (Calladine 2004). The majority of Lesser Black-backed Gulls in Scotland breed on the coast (86%, 21,565 AONs). The 1998-2002 count of coastal breeding Lesser Black-backed Gulls was the highest of the three comprehensive surveys: 12,031 in 1969-70 and 19,524 in 1985-88. For some colonies that have been monitored annually, peaks were reached in the 1990s and there is some evidence of recent declines however (Calladine 2004). The Lesser Black-backed Gull is currently on the Amber List of Birds of Conservation Concern, principally because the UK holds the majority of the global breeding population of the race *L. f. graelsii* (Gregory *et al.* 2002).

The majority of Lesser Black-backed Gulls leave Scotland after breeding, spending the winter at locations extending between southern Britain and north-west Africa (Rock 2002). There has been an increasing tendency for more birds to remain within their breeding range throughout the year over recent decades, however, although numbers in Scotland during the winter months are still considerably less than in the summer. In winter, they tend to be concentrated around the Firth of Clyde and the Solway Firth (Baker 1980, Hickling 1986a, Rock 2002), with a minimum of 452 counted at roosts in January 1993 (Burton *et al.* 2003). In January 2004, based on counts at 41 winter roosts, there has been a subsequent 112% increase in the number of Lesser Black-backed Gulls in Scotland in mid-winter (Burton *et al.* 2004).

Lesser Black-backed Gulls have been reported nesting on buildings in the Bristol Channel area since the 1960s (Cramp 1971). By 1976, small numbers were found in north-east England (Monaghan & Coulson 1977). Roof nesting had become widespread across the Central Belt and occurred elsewhere on the east coast of Scotland by 1993-95 (Table 4.3, Raven & Coulson 1997), with numbers generally increasing by the 1999-2002 survey (Table 4.3, Calladine 2004). The vast majority (>98%) of the reported 4,309 AONs in 1998-2002 were in urban areas, the remainder being largely within industrial complexes (JNCC data). Most roof-nesting Lesser Black-backed Gulls in Scotland are found currently in the Central Belt, where they now breed in many urban areas (Figure 4.5). Concentrations are reported in the western parts of the Central Belt (*e.g.* Glasgow, Renfrew and Cumbernauld: Table 4.3). Recent counts from the east (Edinburgh and its surrounds) are lacking, although significant numbers are thought to be present: at the last attempt at a complete count in 1994, a minimum of c.80 pairs was estimated for Edinburgh and its surrounds, with a further c.30 pairs on roofs at Granton harbour (Dott 1994). Outside of the Central Belt, breeding Lesser Black-backed Gulls are found in numbers in the City of Aberdeen, Dumfries and in Ayrshire (Figure 4.5). The first instance of roof-nesting by Lesser Black-backed Gulls in Shetland was reported in 2003 (Okill 2004).

4.2.4 Herring Gull (*Larus argentatus*)

A predominantly, though not exclusively, coastal breeding species in Scotland, 72,130 AONs of Herring Gulls were estimated during 1998-2002 (Madden & Newton 2004). The coastal proportion of that count (71,659 AONs) compares to 159,237 in 1969-70 and 92,950 in 1985-88 (Madden & Newton 2004). Based on similar declines across

the UK, the species is currently placed on the Amber List of Birds of Conservation Concern (Gregory *et al.* 2002), and recent trends appear to qualify it for the Red List ('high concern', Mitchell 2004).

Many Herring Gulls from Scotland disperse south outside of the breeding season, with substantial numbers moving to the Irish and southern North Sea coasts. Wintering numbers in Scotland are augmented, particularly on the east coast, by birds from of Fenno-Scandinavia breeding origins (Calladine 2002). The winter distribution of Herring Gulls is broadly similar to that during the breeding season, although there are greater concentrations inland during the winter, notably in the Central Belt (Hickling 1986b). In January 1993, a minimum of 90,972 Herring Gulls roosted in Scotland (Burton *et al.* 2003). Although the derived index based on counts from 112 roosts suggests a subsequent decline by 2004, the trend is not statistically significant (Burton *et al.* 2004).

Herring Gulls have nested on some roofs in southern England since at least the 1920s and in north-east Scotland since at least the 1950s (Cramp 1971). Relatively small numbers were recorded nesting in Scottish east coast towns by 1974-75, and these had increased substantially, including occupation of rooftops in the Central Belt, by 1993-95 (Monaghan & Coulson 1977, Raven & Coulson 1997, Table 4.4). With the notable exception of the City of Aberdeen, numbers reported at many sites already holding roof-nesting Herring Gulls by 1993-95 were similar in 1998-2002. Many additional sites had either become occupied, or were first reported, in the intervening period, however, and the Herring Gull remains the most abundant roof- and urban-nesting gull in Scotland (Table 4.4). As with the Lesser Black-backed Gull, the majority (>95%) of Herring Gulls reported as nesting on buildings (6,202 AONs) in 1998-2002, did so in urban areas (Table 4.4). The largest concentrations of roof-nesting Herring Gulls in Scotland are in the east coast towns between Dundee and Inverness, with smaller colonies across the Central Belt, in Berwickshire, Ayrshire and in Dumfries (Figure 4.6). As with the Lesser Black-backed Gull, recent data from the Edinburgh area are lacking: the most recent attempt at a full survey in 1994 recorded a minimum of c.40 pairs in Edinburgh and its surrounds and a further 12 pairs on roofs at Granton Harbour (Dott 1994). The biased distribution of roof-nesting Herring Gulls towards the east coast of Scotland contrasts markedly with the concentrations of roof-nesting Lesser Black-backed Gulls in the Central Belt and broadly reflects the differences in the breeding distributions of the two species in the wider countryside (Gibbons *et al.* 1993, Mitchell *et al.* 2004).

4.2.5 *Great Black-backed Gull* (*Larus marinus*)

With an almost exclusively coastal breeding distribution, 14,776 AONs of Great Black-backed Gulls were estimated during 1998-2002, concentrated in the Northern Isles and on the north and west coasts (Reid 2004). In 1969-70, 15,950 and in 1985-88, 15,315 AONs were counted in Scotland. The species is currently on the Green List of Birds of Conservation Concern in the UK (Gregory *et al.* 2002).

Although some Great Black-backed Gulls disperse south after breeding, principally to the coasts of the Irish and North Seas, birds of Fenno-Scandinavia breeding origins winter in Scotland (Reid 2002). The winter distribution remains similar to that of breeding birds, although birds also occur in inland, lowland areas during the winter

(Monaghan 1986). A minimum of 2,970 Great Black-backed Gulls roosted in Scotland in January 1993 (Burton *et al.* 2003), with a suggested decline, based on counts from 96 roosts, of 23% between the 1993 count and January 2004 (Burton *et al.* 2004).

The only records of roof nesting by Great Black-backed Gulls in Britain up to 1974 were in Cornwall (Cramp 1971, Monaghan & Coulson 1977). By 1994, a total of 6 pairs was reported nesting on buildings in Scotland (Raven & Coulson 1997). The number reported in urban areas was 21 AONs by 1998-2000, with sizeable colonies also established at the Nigg Oil Terminal in Easter Ross (136 AONs, principally on industrial structures) and 57 AONs at Quedal on Rousay, Orkney (Figure 4.7); at the latter site, man-made structures were not recorded as the principal habitat at the colony however (JNCC data). Great Black-backed Gulls have also been recorded nesting in Dumfries in 2003 (one pair) and 2004 (two pairs; J. Coulson pers. comm.).

4.2.6 Kittiwake (*Rissa tridactyla*)

Breeding exclusively on the coasts, 282,213 AONs of Kittiwake were estimated in Scotland during 1998-2002, with most colonies on the North Sea coast and in the Northern Isles (Heubeck 2004). The two earlier surveys found greater numbers, with 359,425 AONs estimated in 1985-88 and 346,097 AONs in 1969-70. Due to the recent decline, the Kittiwake is currently on the Amber List of Birds of Conservation Concern (Gregory *et al.* 2002).

Unlike the other five species of breeding gulls considered in this report, Kittiwakes feed mainly on pelagic shoaling fish, although they also take fishing discards. They do not normally feed inland or utilise garbage (Heubeck 2004). Outside of the breeding season, Kittiwakes are found almost exclusively at sea, and although they are present around all Scottish coasts throughout the winter, Scottish-bred birds can range widely, including crossing the Atlantic (Coulson 1986, 2002).

Although Kittiwakes do nest on some buildings and other man-made structures at the coast, and have done so in Scotland since at least the 1930s (Cramp 1971), and also on some natural cliffs in urban areas, this species has not been identified with problems associated with urban gulls in Scotland (Chapter 3).

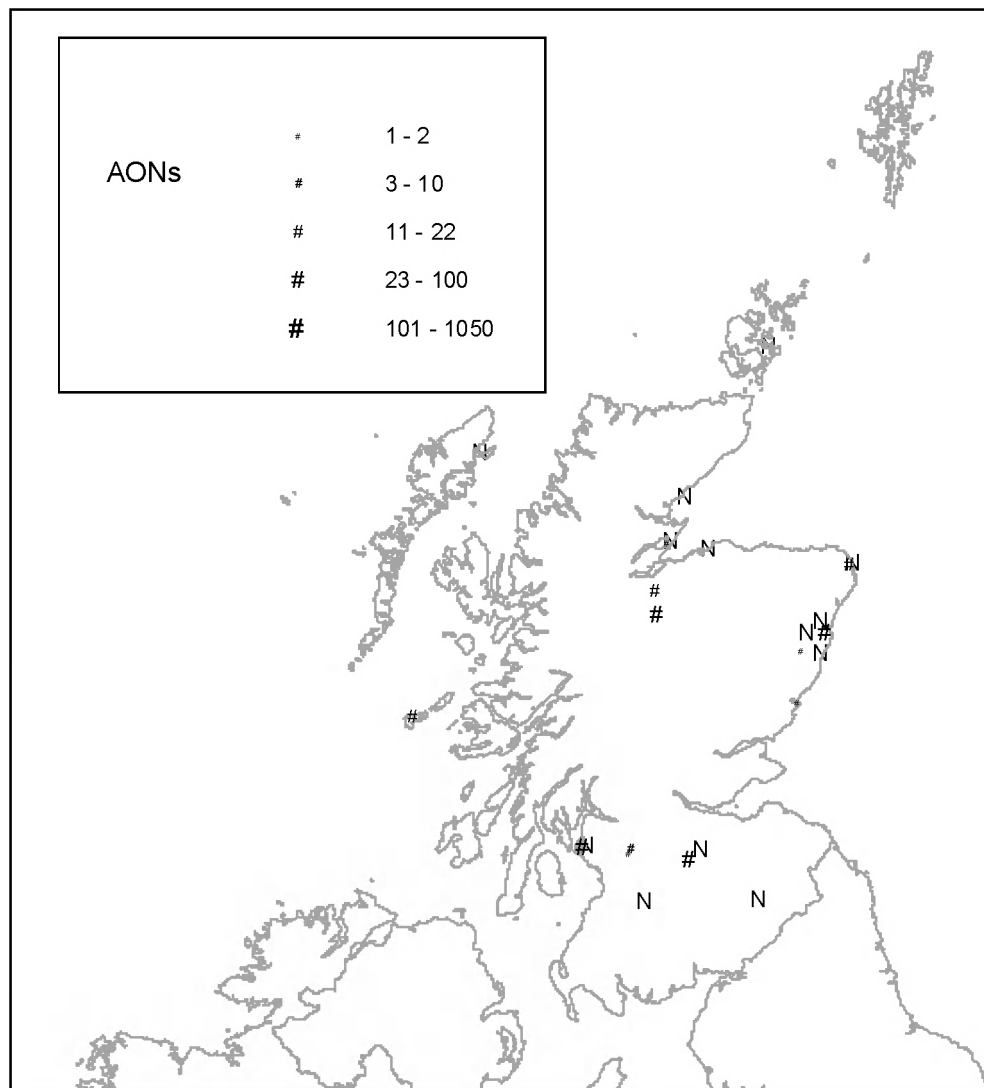


Figure 4.3

The distribution of urban and roof-nesting Black-headed Gulls in Scotland reported during the 'Seabird 2000' survey (1998-2002). Numbers in the legend refer to AONs. Crosses show additional from which urban and roof-nesting Black-headed Gulls were reported during 1968-1998 (Source: JNCC data).

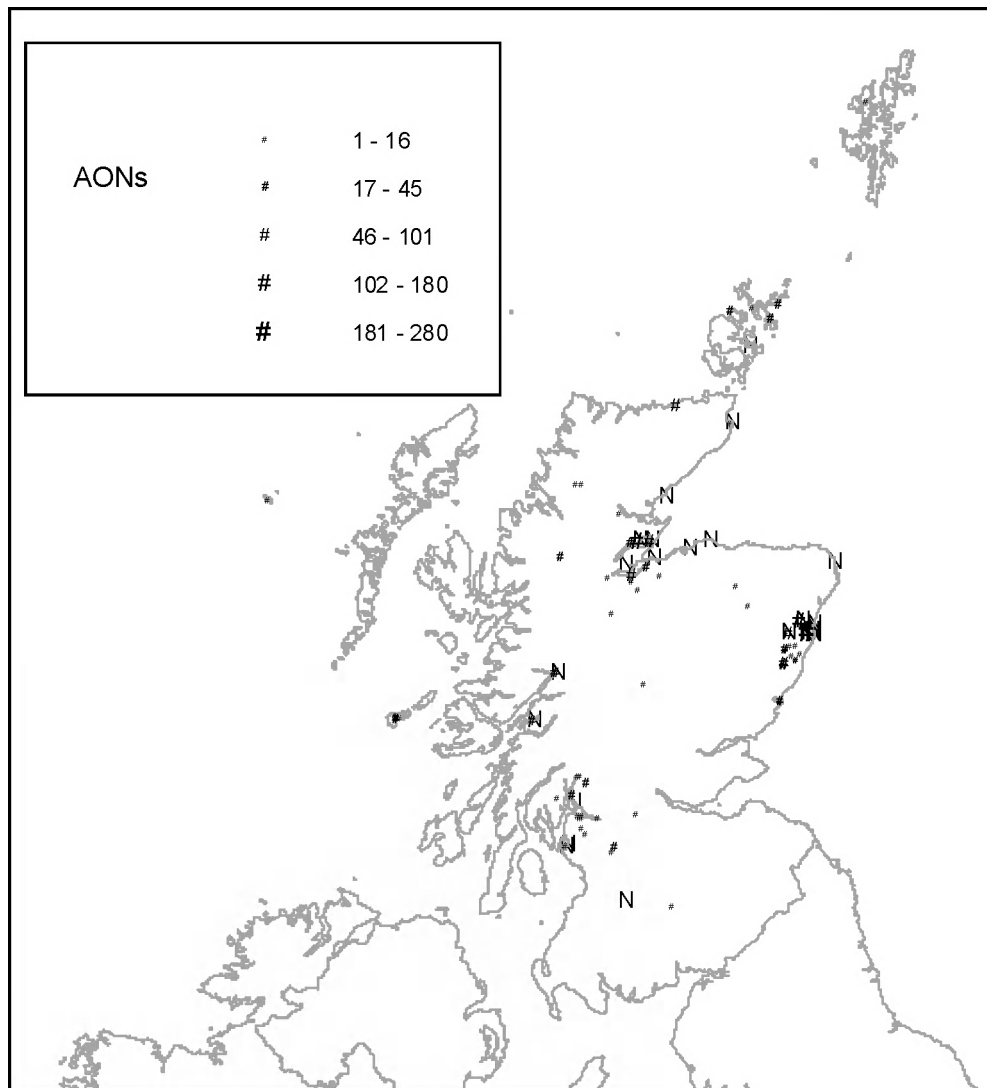


Figure 4.4

The distribution of urban and roof-nesting Common Gulls in Scotland reported during the 'Seabird 2000' survey (1998-2002). Numbers in the legend refer to AONs. Crosses show additional sites from which urban and roof-nesting Common Gulls were reported during 1968-1998 (Source: JNCC data).

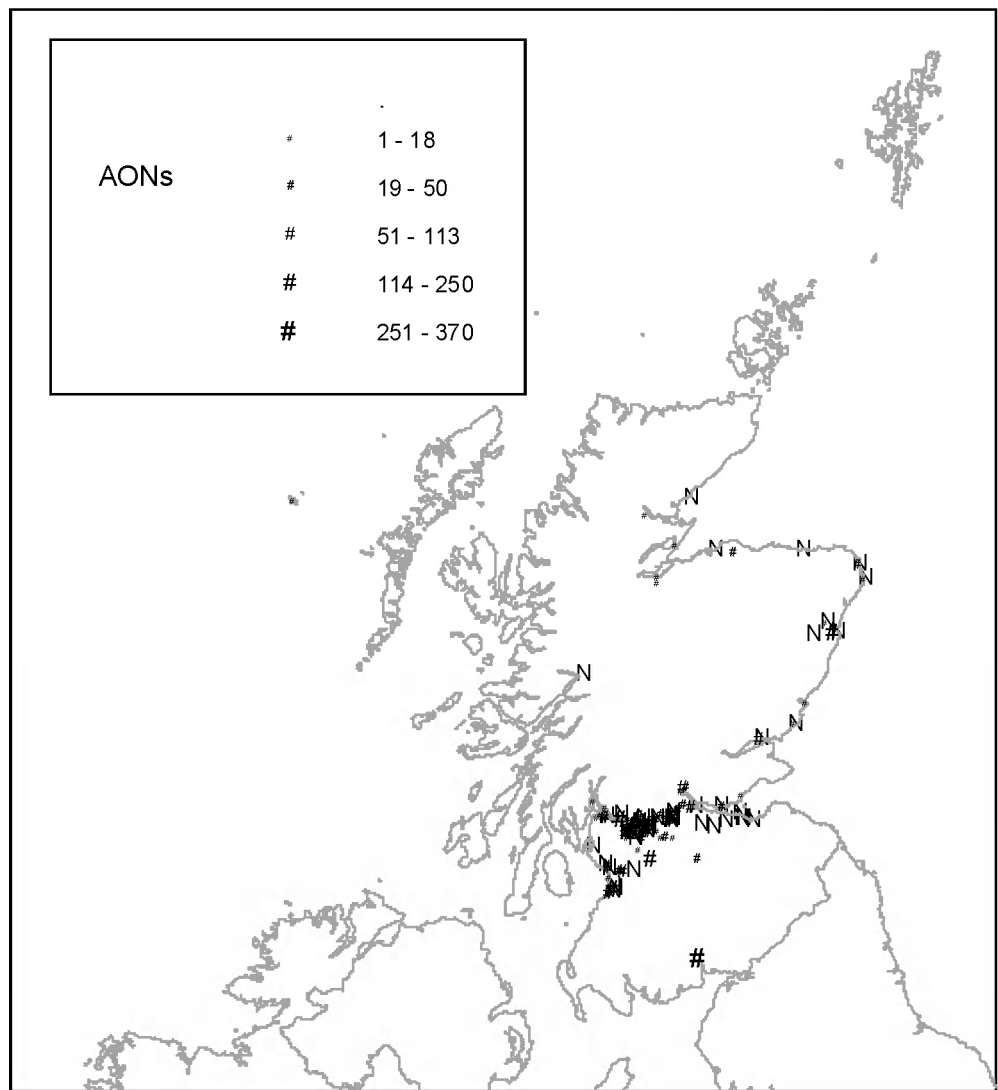


Figure 4.5

The distribution of urban and roof-nesting Lesser Black-backed Gulls in Scotland reported during the 'Seabird 2000' survey (1998-2002). Numbers in the legend refer to AONs. Crosses show sites from which urban and roof-nesting Lesser Black-backed Gulls were reported during 1968-1998 (Source: JNCC data, Coulson & Coulson 1999-2002).

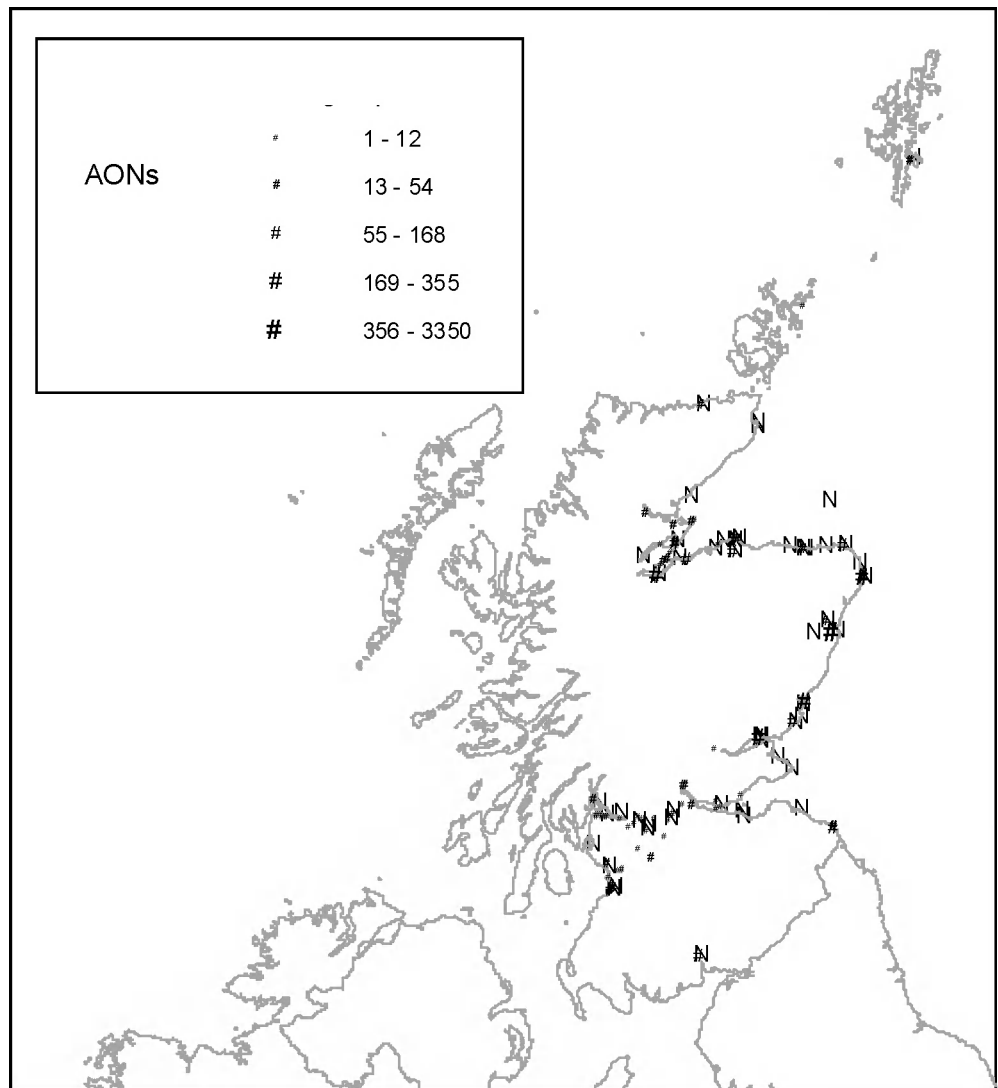


Figure 4.6

The distribution of urban and roof-nesting Herring Gulls in Scotland reported during the 'Seabird 2000' survey (1998-2002). Numbers in the legend refer to AONs. Crosses show additional sites from which urban and roof-nesting Herring Gulls were reported during 1968-1998 (Source: JNCC data, Coulson & Coulson 1999-2002).

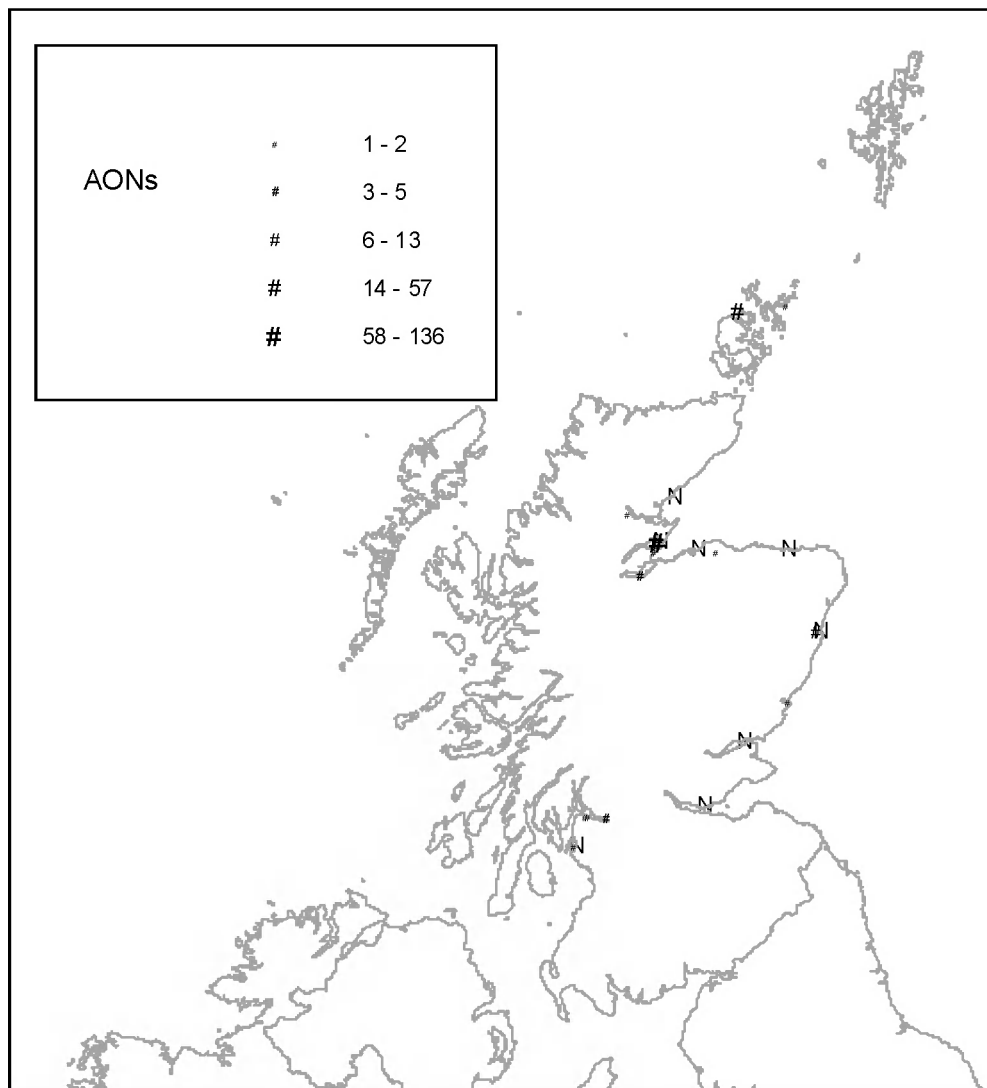


Figure 4.7

The distribution of urban and roof-nesting Great Black-backed Gulls in Scotland reported during the 'Seabird 2000' survey (1998-2002). Numbers in the legend refer to AONs. Crosses show additional sites from which urban and roof-nesting Great Black-backed Gulls were reported during 1968-1998 (Source: JNCC data).

Table 4.1

Numbers of Apparently Occupied Nests (AONs) of urban and roof-nesting Black-headed Gulls reported during three survey periods, by administrative area of Scotland (Source: JNCC data).

Administrative area	1974-76	1993-95	1998-2002 (urban only)	1998-2000 (urban and other roof-nesting)
Angus	.	.	1	1
Argyll and Bute	.	.	0	19
Banff and Buchan	.	65	0	22
City of Aberdeen	.	175	1118	1118
Clydesdale	.	.	0	100
Cumnock and Doon Valley	.	.	0	0
Cunninghame	.	210	50	50
Eastwood	.	.	0	12
Inverness	.	.	0	67
Kincardine and Deeside	.	.	0	1
Ross and Cromarty	.	.	0	1
TOTAL	0	450	1169	1391

Table 4.2

Numbers of Apparently Occupied Nests (AONs) of urban and roof-nesting Common Gulls reported during three survey periods, by administrative area of Scotland (Source: JNCC data).

Administrative area	1974-76	1993-95	1998-2002 (urban only)	1998-2002 (urban and other roof- nesting)
Angus	.	.	19	19
Argyll and Bute	.	1	40	97
Banff and Buchan	.	.	0	1
Caithness	.	12	86	86
City of Aberdeen	.	182	410	410
Clydesdale	.	.	0	12
Cumbernauld and Kilsyth	.	.	3	3
Cunninghame	.	.	4	4
Dumbarton	.	.	40	77
Eastwood	.	.	0	38
Gordon	.	.	0	77
Inverclyde	.	2	19	22
Inverness	.	20	96	107
Kincardine and Deeside	.	.	0	210
Lochaber	.	25	20	20
Moray	.	.	0	5
Nairn	.	.	0	7
Orkney	.	.	0	67
Perth and Kinross	.	.	0	1
Renfrew	.	.	0	8
Ross and Cromarty	.	34	0	366
Shetland	.	.	1	1
Sutherland	.	.	13	17
Western Isles - Comhairle nan eilean	.	.	0	1
TOTAL	0	276	751	1656

Table 4.3

Numbers of Apparently Occupied Nests (AONs) of urban and roof-nesting Lesser Black-backed Gulls reported during three survey periods, by administrative area of Scotland (Sources: JNCC data, Coulson & Coulson 1999-2002).

Administrative area	1974-76	1993-95	1998-2002 (urban only)	1998-2002 (urban and other roof-nesting)
Angus	.	0	7	7
Banff and Buchan	.	5	4	27
Bearsden and Milngavie	.	10	118	118
City of Aberdeen	.	50	159	159
City of Dundee	.	7	65	65
City of Edinburgh	.	113	.	.
City of Glasgow	.	140	640	640
Clackmannan	.	.	88	88
Clydebank	.	.	30	30
Clydesdale	.	.	40	40
Cumbernauld and Kilsyth	.	350	449	449
Cunninghame	.	32	97	97
Dumbarton	.	175	134	143
Dunfermline	.	.	38	38
East Kilbride	.	.	250	250
East Lothian	.	1	.	.
Eastwood	.	.	39	39
Falkirk	.	4	179	179
Inverclyde	.	141	189	189
Inverness	.	.	6	6
Kilmarnock and Loudon	.	1	134	134
Kirkcaldy	.	.	6	6
Kyle and Carrick	.	143	311	311
Moray	.	1	28	28
Motherwell	.	.	34	34
Nithsdale	.	.	370	370
Renfrew	.	211	518	518
Ross and Cromarty	.	.	0	6
Strathkelvin	.	12	329	329
Sutherland	.	.	1	1
West Lothian	.	15	.	.
Western Isles - Comhairle nan eilean	.	.	0	8
TOTAL	0	1411	4263	4309

Table 4.4

Numbers of Apparently Occupied Nests (AONs) of urban and roof-nesting Herring Gulls reported during three survey periods, by administrative area of Scotland (Sources: JNCC data, Coulson & Coulson 1999-2002).

Administrative area	1974-76	1993-95	1998-2002 (urban only)	1998-2002 (urban and other roof-nesting)
Angus	0	448	398	398
Banff and Buchan	.	322	444	473
Bearsden and Milngavie	.	.	6	6
Berwickshire	22	125	194	194
Caithness	.	131	50	50
City of Aberdeen	1	2020	3370	3370
City of Dundee	9	.	296	296
City of Edinburgh	.	43	.	.
City of Glasgow	.	6	19	19
Clackmannan	.	.	35	35
Clydebank	.	.	0	0
Cumbernauld and Kilsyth	.	13	17	17
Cunninghame	.	4	19	19
Dumbarton	.	5	10	30
Dunfermline	.	.	18	18
East Kilbride	.	.	20	20
East Lothian	.	23	.	.
Eastwood	.	.	0	1
Falkirk	.	.	24	24
Inverclyde	.	35	40	40
Inverness	3	150	356	356
Kilmarnock and Loudon	3	.	15	15
Kirkcaldy	.	.	10	10
Kyle and Carrick	.	159	144	144
Moray	1	32	153	164
Motherwell	.	.	1	1
Nairn	9	.	80	80
Nithsdale	.	3	65	65
North East Fife	.	2	.	.
Orkney	.	.	0	1
Perth and Kinross	.	.	1	1
Renfrew	.	.	0	1
Ross and Cromarty	1	35	83	295
Shetland	6	59	21	21
Strathkelvin	.	.	5	5
Sutherland	.	.	33	33
West Lothian	.	5	.	.
Wigtown	0	.	.	.
TOTAL	55	3620	5927	6202

Table 4.5

Numbers of Apparently Occupied Nests (AONs) of urban and roof-nesting Great Black-backed Gulls reported during three survey periods, by administrative area of Scotland (Source: JNCC data).

Administrative area	1974-76	1993-95	1998-2000 (urban only)	1998-2000 (urban and other roof-nesting)
Angus	.	.	2	2
Banff and Buchan
City of Aberdeen	.	2	9	9
City of Edinburgh	.	1	.	.
Cunninghame	.	1	1	1
Dumbarton	.	.	0	3
Inverclyde	.	1	2	2
Inverness	.	.	5	5
Kyle and Carrick	.	1	.	.
Moray	.	.	1	1
Orkney	.	.	0	58
Ross and Cromarty	.	.	0	255
Sutherland	.	.	1	1
TOTAL	0	6	21	337

5 Ecology of gulls in urban areas

This chapter provides a review of our current knowledge of the ecology of urban gulls in Scotland, with additional information from the rest of the UK if it is of relevance to the Scottish situation. We first consider the available evidence for the origins of the gulls that inhabit towns and cities. We then consider some possible reasons for their attraction to urban areas and evaluate the scientific evidence to support the possible hypotheses.

Published studies of urban gulls have concentrated on surveys of abundance and distribution of breeding birds (*e.g.* Monaghan & Coulson 1977, Raven & Coulson 1997, Mitchell *et al.* 2004) or are otherwise reports commissioned locally aimed at quantifying or suggesting measures to alleviate perceived problems. Studies on the ecology of gulls specifically in urban areas are scarce and those from other natural habitats must be interpreted with caution as to whether their results are applicable to the urban environment.

5.1 Exchange between urban areas and the wider countryside

The gulls that use urban areas are, as far as is known, not of populations that remain distinct from those using non-urban areas. For example, ringing recoveries have shown that young Herring Gulls reared on the Isle of May (a ‘natural’ site in the outer Firth of Forth, Scotland) have been found breeding in urban areas of north-east England (Monaghan & Coulson 1977, Monaghan 1979). Analyses of ringing recovery data from Britain and Ireland for four of the gull species considered in this report (not reported for Great Black-backed Gull) suggest that breeding dispersal (the movement of adults between breeding locations) and natal dispersal (the movement of young birds from their natal colony to the colony in which they first breed) distances are typically in the tens of kilometres, and movements of over 100 km have been recorded (Paradis *et al.* 1998, Wernham *et al.* 2002). Hence transfers between non-urban and urban sites are, in theory, readily feasible.

A recent study suggests that levels of exchange of Lesser Black-backed Gull recruits between urban and ‘traditional’ colonies around the Severn Estuary are low, however, based on sightings of colour-ringed individuals (Rock 2003, Rock in prep); this suggested result could be confounded by different numbers of colour ringed birds marked at the different colonies and also by differential search effort between the two types of colony however. Indeed, general ringing recoveries from elsewhere in England and Wales suggest that the interchange of recruits from different types of colonies continues to be widespread, for Lesser Black-backed Gulls at least (Rock in prep). Furthermore, there are likely to be seasonal differences whereby some local populations or individuals will use towns as nesting sites while others may use them as winter foraging areas. One of the very few published studies on urban gulls in winter showed that Herring Gulls were present in much reduced numbers during September to November compared to during the breeding season (March to August) during the single year reported (Gibbins 1991 in north-east England), suggesting that many of the birds moved away from the urban environment outside the breeding season.

Based on the surveys described in Chapter 4, numbers of the five species of gull breeding in Scotland's urban areas, and also considered in this report, have apparently continued to increase up to at least the most recent survey in 1998-2002. In contrast, the overall population trends in Scotland for Black-headed Gull, Herring Gull and Great Black-backed Gull show declines between 1986-88 and 1998-2002, while the Lesser Black-backed Gull has shown only a very modest increase during the same time period, although increases in England, including the north of England, have been great (Mitchell *et al.* 2004). The Common Gull is the only species with a population that has apparently increased overall in Scotland, as well as in urban areas. Although there are biases associated with the different survey methods that have been used to count gulls through time (Chapter 4), there is no reason to believe that there have been differences in the efficiency of monitoring gulls in urban and non-urban environments, and thus the divergence in the trends in numbers of gulls breeding in urban and non-urban areas is believed to be real. The expansion of breeding gull numbers in urban areas does not appear always to be driven by expansion of the populations of the species as a whole (although this may have been the case up until the late 1970s; J. Coulson pers. comm.) but, rather, more complex causes are suggested to explain current increases.

Some of the most plausible hypotheses for the recent expansion of numbers in urban areas might be as follows (and these need not be mutually exclusive):

- Urban sites have become more attractive to immature gulls recruiting into the breeding population;
- Urban sites have become more attractive to adult gulls that have bred previously in 'natural' sites;
- Non-urban or 'natural' sites (typically coastal cliffs and islands) have become less attractive to nesting gulls;
- Survival rates of breeding adult gulls are higher in urban areas;
- Gulls breed more successfully in urban areas and their surviving offspring recruit into local breeding colonies or those at other similar urban sites.

In the sections that follow, we examine current knowledge of the ecology of urban and non-urban gulls for evidence in support of one or more of the above explanations.

5.2 Breeding success

In north-east England in the 1970s, the breeding success of roof-nesting Herring Gulls was significantly higher (1.2 – 1.6 fledged chicks per pair) than those breeding in 'natural' areas over the same time period (typical reported estimates of 0.6 – 1.2 fledged chicks per pair) (Monaghan 1979). The latter study considered reduction in the intra-specific predation on chicks and reduced territorial aggression in structurally isolated sites for roof nesting gulls (except for denser colonies on flat roofs) to be principal factors leading to greater breeding success. In 1990, in Sunderland, the recorded breeding success of roof-nesting Herring Gulls at or above levels in the 1970s, averaging 1.86 fledged chicks per pair (Gibbins 1991). Generally high levels of breeding success are also reported for urban nesting Lesser Black-backed Gulls in the Bristol area (Rock in prep). It has also been suggested, although not demonstrated analytically, that gulls are able to nest earlier in urban areas than in 'traditional'

colonies in response to generally warmer ambient temperatures (Rock in prep), although there is little evidence for this earlier breeding in Dumfries compared to gulls breeding at natural sites (J. Coulson pers. comm.). There is no data available currently on the breeding success of gulls in urban areas of Scotland that would allow a comparison with the productivity of pairs at more natural breeding sites.

In North America, studies of urban nesting Herring Gulls and Ring-billed Gulls in northern Ohio reported lower hatching and fledging success by urban nesting pairs than those in more traditional colonies in the Great Lakes area (Belant *et al.* 1998) in contrast to the limited observations from Britain (Monaghan 1979, Gibbins 1991).

5.3 Survival rates

Although estimates of survival rates for adult Herring Gulls and Lesser Black-backed Gulls breeding in non-urban areas in Britain are available (Chabrzyk & Coulson 1976, Coulson & Butterfield 1986, Wanless *et al.* 1996), no studies of the survival rates of gulls breeding in urban areas are available for comparison.

5.4 Recruitment

The recruitment mechanisms of gulls, whereby birds breeding for the first time select where to nest, are poorly understood. Because all the species under consideration here are colonial breeders, young gulls tend to be attracted to areas that have already been colonized and to areas where breeding by conspecifics is successful. A study of Kittiwakes at a non-urban site in Brittany demonstrated a significant positive correlation between breeding success in a colony, and also within parts of a colony, and subsequent local recruitment (Danchin *et al.* 1998); new breeders tended to recruit into areas where breeding success had been relatively high in the previous year, and also some failed breeders moved to more productive areas. Kittiwakes, in common with most of the species of gull that breed in urban areas of Scotland, normally breed first at the age of four years, and it is probable that they spend some of their time as immatures assessing the reproductive success of their conspecifics. A study of individually marked Herring Gulls recruiting into the breeding population showed that potential recruits often first returned to their natal colony but, before actually breeding, many moved and eventually nested elsewhere, suggesting that young birds evaluate their natal colony before ‘deciding’ whether to stay or breed elsewhere (Vercrujse 1999).

Assuming that high breeding success (Section 5.2) is typical for roof-nesting gulls, and that recruitment can be encouraged by performance-based conspecific attraction, it could be that urban nest sites on roofs may be more attractive to recruiting gulls than more natural nest sites. In contrast to this view, some studies in North America have suggested that roofs are suboptimal habitats that have only been colonised as a result of numbers in more suitable areas expanding such that natural habitats have become saturated (Belant 1997). This has also been suggested as a cause for the initial development of some urban colonies in the UK, whereby recruits from saturated natural colonies moved onto roofs during a period of general increase in the gull population (Monaghan & Coulson 1977). The subsequent increase in gull numbers in

urban areas of Scotland over a period when non-urban colonies have declined, particularly those Herring Gulls (Chapter 3), implies that this is not the likely cause of current increases in urban gulls in Scotland however.

A corollary to the above could be that more natural or non-urban colonies have become less attractive to recruiting gulls, thus leading to a greater proportion of the total population using urban nest sites. From the 1960s through to the 1980s, breeding gulls were culled at a number of natural colonies (*e.g.* Thomas 1972, Coulson 1991). Although some culls have continued, these have mostly been on a reduced scale. Extensive culling and clutch destruction at colonies in the Forth of Forth, Northumberland and Lancashire are speculated to have contributed to the spread of urban breeding gulls in Scotland (Raven & Coulson 1997). Potential recruits may judge a colony where breeding success is being suppressed as unsuitable and chose to nest elsewhere. Any adults that survive a cull may also chose to move to new breeding sites. Although adult gulls can show marked fidelity to nesting areas once selected, even in the presence of disturbance (*e.g.* Southern *et al.* 1985, for Herring Gulls in North America), this behaviour may vary between species (*e.g.* Wanless *et al.* 1996). As well as differences between species, the likelihood of established adults abandoning a breeding colony to move elsewhere may also vary between sites but there are too few studies to allow rigorous comparisons to be made. The greater rates of increase and spread of Lesser Black-backed Gulls breeding in urban areas compared to Herring Gulls during the 1980s and 90s (Raven & Coulson 1997, Chapter 3) may be at least partly attributable to a difference in tenacity to breeding sites.

5.5 Food and foraging behaviour

Whatever the mechanism by which urban sites could potentially be more attractive to some nesting gulls, the ultimate causes are likely to involve a combination of availability of food and security of nest sites. All five of the suggested biological reasons for the apparent divergence in trends between urban and non-urban gull colonies given above, are influenced to some degree by the availability of food. Urban areas potentially offer additional sources food, such as garbage (both litter and from nearby refuse tips), scraps from shops (including fast-food outlets), waste from fish docks, and also food put out by some people specifically to feed the gulls (*e.g.* Raven & Coulson 1997, pers. comms with Scottish Local Authority representatives, see Chapter 3). Street lighting within urban areas also gives the potential for gulls, which are normally diurnal feeders, to forage at night (*e.g.* Rock 2003). Furthermore, gulls nesting within urban areas can potentially travel to more 'traditional' food sources, for example within the inter-tidal zone, on agricultural land and also at sea, provided these are within an acceptable foraging distance from nesting areas for the species concerned. No published studies explicitly quantify differences in the diets of gulls in urban and non-urban areas in Britain. Studies of Ring-billed Gulls and Herring Gulls in North America suggest that anthropogenic food from garbage tips can form a higher proportion of the diet for birds in urban areas than elsewhere, but also that the relative importance of this food source can vary between species (Brousseau *et al.* 1996, Belant *et al.* 1998). The relative importance of garbage taken from organised tips or as 'litter' discarded within towns is unknown.

Gulls nesting in urban areas need not necessarily feed within them, and similarly, those seen foraging within urban areas need not necessarily be birds nesting there. In Sunderland, the numbers of Herring Gulls frequenting the town centre in summer exceeded, by up to three-fold, the expected number based on immediate local breeding numbers (Gibbins 1991). Furthermore, infrequent sightings of colour-ringed individuals suggested that many birds in the town centre were transients and used it infrequently even during the breeding season (Gibbins 1991). An analysis of remains in pellets regurgitated by Lesser Black-backed Gulls nesting in Dumfries during May – July, suggested that the surrounding agricultural land provided more important foraging areas than the town itself (Coulson & Coulson 2003); although processed foods (the largest components of edible urban garbage) are not generally identifiable within pellets due to their high digestibility, observations of foraging gulls provided supportive evidence that only a relatively small proportion of those breeding in the town actually foraged there. During the period when gulls first colonised urban areas in the UK (1960-1980), observations suggested that few actually fed within the urban environment (J. Coulson, pers. comm.), and unpublished direct observations relating to gulls in Dumfries and in towns in north-east England suggest that even now, less than 5% of breeding gulls actually forage in the streets of urban areas (J. Coulson, pers. comm.). Observations of 300 individually colour-ringed and dyed Herring Gulls ringed at Burniston refuse tip, *c.* 3km from Scarborough, found only two of the birds breeding within Scarborough but many breeding at natural cliff sites up to 35km away from the tip (J. Coulson pers. comm.). Other observations of colour-marked Herring Gulls nesting in urban areas of Tyneside and Wearside have also indicated that they rarely visited landfills in the area (J. Coulson pers. comm.), indicating that at least in some cases, such landfills are not a major food source for the urban gull population.

The foraging ranges of gulls vary between species, and based on observations of birds breeding in non-urban areas and feeding at sea, Lesser Black-backed Gulls can range the greatest distances from breeding colonies, followed by Herring Gulls, Common Gulls and Black-headed Gulls in order of decreasing normal ranging distance (Camphuysen 1995, Garthe 1997, Noordhuis & Spaans 1992). At sea, Lesser Black-backed Gulls have been recorded over 135 km from breeding colonies in the summer (Garthe 1997), although the individuals observed were not necessarily current breeders. Observations of individuals foraging from breeding colonies suggest that gulls typically forage up to 30 km distant (Pearson 1968, Mudge & Ferns 1982, McCleery & Sibly 1986), and the ranking of ranging ability observed at sea probably applies across all habitats. Where Herring Gull and Lesser Black-backed Gull diets were similar, their foraging areas tended to differ spatially, Lesser Black-backed Gulls travelling further (readily up to 30 km) whereas a lesser proportion of Herring Gulls tended to range to those distances (Mudge & Ferns 1982). The availability of food close to suitable nest sites is likely to place a greater limitation on the choice of breeding sites for those species with a lesser ability to range. In this case, of the species considered, Lesser Black-backed Gulls might be the species most able to take advantage of buildings as secure nest sites when food sources are either dispersed or unreliable close to the nesting area.

5.6 Nest site selection and predation pressure

Of the two most abundant species nesting in urban areas, the Herring Gull and the Lesser Black-backed Gull, in natural sites, the latter tends to nest in more vegetated, often flatter areas (Harris 1964, Hosey & Goodridge 1980, Calladine 1997). With supportive evidence from attendance rates of adults at nest sites, it has been suggested that the more vegetated sites are selected by Lesser Black-backed Gulls to offer greater opportunities for concealment from predators during longer periods of parental absence (Calladine 1997). If predation of young is a less significant risk amongst roof-nesting gulls in general, as observed in northeast England in the 1970s (Monaghan 1979), then nesting in urban sites may permit gulls to forage more widely and therefore be less susceptible to variations or reductions in immediately local food supplies. A reduction in the availability of food within acceptable foraging distances of breeding colonies has been implied as causal reasons for some recent declines in a natural colony (Skomer Island in Wales; Perrins & Smith 2000). Therefore, as well as the supplementary food sources potentially available to gulls in urban areas, urban sites might prove more attractive if young are at a lesser risk from predation permitting adults to forage more widely where food resources could be dispersed or unpredictable.

The principal reason for reduced predation of young gulls in urban colonies was suggested as the greater isolation of nest sites, with these typically resting between chimney pots, leading to a much reduced instance of intra-specific predation, or cannibalism, of the chicks (Monaghan 1979). In situations where gulls nested on flat roofs, nests were not as isolated, and breeding success was lower and more typical of natural sites (Monaghan 1979). Contrary to this, in Sunderland in 1990, breeding success on flat roofs was reported as the highest of all roof types (Gibbins 1991). It may be that differences in the overall densities of breeding gulls between these study areas also influenced the rates of intra-specific predation and hence breeding success but these densities are not reported to allow direct comparison. Nor are there any comparable data available for urban gulls in Scotland.

The preferred nest sites in urban areas reported during the 1970s were on chimneys, typically between double rows of chimney pots, on small roofs over dormer windows or such similar isolated platforms (Cramp 1971, Monaghan & Coulson 1977, Monaghan 1979). Lesser Black-backed Gulls, in particular, have taken increasing advantage of more extensive flat roofs (*e.g.* Raven & Coulson 1997, Coulson & Coulson 1999-2003, Rock in prep.) that in some ways mimic their preference for flat nesting areas in traditional colonies (*e.g.* Calladine 1997). The development and expansion of industrial units with flat roofs is likely to have increased the availability of suitable nest sites for Lesser Black-backed Gulls in many areas.

5.7 General causes of changes in gull populations

For much of the 20th Century, most populations of breeding gulls in Britain increased, with increases attributed widely to reduced exploitation and persecution, increased protection and increased food availability (*e.g.* Lloyd *et al.* 1991). The most recent extensive surveys (1998-2002; Mitchell *et al.* 2004) show that Black-headed and

Herring Gulls have declined during the last two decades, and that some local or recent declines in Lesser Black-backed and Common Gulls have also occurred (Section 4.2).

The reasons that have been suggested for these declines, where known or strongly suspected, have generally been reversals of those conditions thought to have led to the earlier increases. During the 1960s, 70s and 80s, Herring Gulls in particular, and Lesser Black-backed Gulls to a lesser extent, were subject to organised culls (see Section 6.5). Reduced food availability, through changes in refuse disposal and fishery discard management, has also been implicated in the declines for some colonies.

In addition to these general reversals in human behaviour, two other factors have also been implied as potentially contributing to some declines in breeding gulls: increased levels of mammalian predation and ingestion of toxins. Predation by mink has been suggested as the principal cause of decline for a number of colonies of Black-headed, Lesser Black-backed and Common Gulls in the west of Scotland (Craik 1997, Craik & Campbell 2000) and increases in other mammalian predators, such as Red Fox (Tapper 1992) may also have impacted on gull numbers on the UK mainland (Ratcliffe 2004). These latter changes may have impacted more on natural colonies than those in urban areas.

Botulism, a condition whereby birds are poisoned by toxins produced by the bacterium *Clostridium botulinum*, is often associated with rubbish tips during warm weather, and has been recorded amongst gulls at a number of colonies (Ratcliffe 2002). Botulism poisoning is considered to have influenced some local colonies of Herring Gulls (Madden & Newton 2002) but evidence of influence at the wider population level (national or regional) is lacking. It is also likely that many reports of botulism poisoning have not been fully diagnosed, such that other toxins may have caused the observed symptoms, such as wing drooping and an inability to stand (J. Coulson, pers. comm.). In addition, a recent outbreak of botulism amongst Common Gulls in the Lake District suggests that landfills are not the only source of this toxin, as this gull species rarely utilises landfills as a food source (J. Coulson, pers. comm.).

6 Methods for controlling urban gull populations

Human intervention to limit gull populations and individual colonies has been undertaken with some, although not universal, success (see Thomas 1972, Calladine & Wernham 1996, Belant 1997, Owen *et al.* 2001 for general reviews). Many of the studies available for information have not been carried out in urban environments, however, and many have included only limited monitoring of their success in limiting gull numbers. The various methods that have been tried are described below, along with any evidence for their success or failure and the practicalities of applying them within urban environments. The legality of using the different methods in the Scottish context is covered in Chapter 7.

6.1 Non-lethal disturbance methods

Once adult gulls have selected a site on which to nest, they can show marked attachment to it regardless of disturbance (*e.g.* Southern *et al.* 1985). Therefore, non-lethal disturbance methods may prove ineffective for deterring breeding birds. However, even if the survival rate of breeding adult gulls in urban colonies is very high (perhaps around 90% per annum), there will still be a proportion of birds (perhaps 10%) that will be breeding for the first time each year. If pre-breeders roosting in or close to urban colonies are subjected to suitable disturbance methods, then it may be possible to deter these more mobile birds from ‘selecting’ the urban colony in which to breed and use this as a long-term strategy for reducing the size of urban colonies.

Site tenacity probably also varies between species (*e.g.* Wanless *et al.* 1996), and individual nesting areas. The latter effect might be a function of the size and age of the colony, with larger and established colonies perhaps being frequented by birds that show higher tenacity and are less affected by such disturbance techniques. Therefore, the overall effectiveness of disturbance methods on breeding gulls might also be expected to vary between species and also between nesting sites. For example, if Lesser Black-backed Gulls have a generally lower tenacity to breeding sites than Herring Gulls (after Wanless *et al.* 1996), then Lesser Black-backed Gulls may be the more likely of the two species to be deterred from breeding sites by such methods.

For deterrence through disturbance to be successful, intensive application over a prolonged period of time is generally thought to be required, particularly if the aim is to deter birds from breeding. The effectiveness of scaring techniques is also likely to lessen with prolonged use, however, as gulls become habituated to them (below), such that the application method might need to be varied through time to minimise the latter problem.

A five year study completed recently looked at a range of disturbance techniques aimed at deterring birds from landfill sites including: falcons, hawks, static and manually operated distress calls, the firing of blanks, rope bangers, lethal control (shotgun), pyrotechnics, bird scaring kites and automated sound generators (Baxter, 2004). Each technique was tested individually and in combination to determine the most effective method of deterring scavenging birds from the sites and the factors

leading to the failure of any system. Some techniques were found to be highly effective over the short term but rarely maintained this effectiveness over longer periods. Combining techniques led to greater success than when individual techniques were used alone (Baxter, 2004).

6.1.1 Broadcasting sounds

The playing of the recorded distress calls of gulls has been used successfully to reduce the numbers roosting on open water: the playing of the distress calls of Black-headed Gulls discouraged the birds from roosting on the Milngavie Reservoirs (Benton *et al.* 1983), and the playing of a combination of distress calls of Black-headed Gulls and Lesser Black-backed Gulls, supplemented with the firing of bird-scare cartridges, proved successful in Oxfordshire (Gosler *et al.* 1995). In North America, breeding Ring-billed Gulls were deterred by a combination of broadcasting distress calls, using shell crackers and also tethered raptors (Morris *et al.* 1992). Such scaring techniques have not been universally successful, however, with the intensive use of pyrotechnics (including shell crackers and sirens) not deterring gulls from some breeding colonies in North America (Olijnyk & Brown 1999, Brown *et al.* 2001).

The broadcasting of other sonic deterrents, such as bangs, is considered less effective in that gulls more readily habituate to these (Bomford & O'Brien 1990, Belant 1997), although frequent repositioning, alteration of the type of noise and the timing of activation may potentially improve effectiveness (Belant 1997). The two effective studies from Britain, for which the results have been published, both used the broadcasting of species-specific distress calls, both were carried out outside of the breeding season, and both were in situations where alternative roosting sites were readily available. Within urban areas, methods that involve the broadcasting of distress calls or use of pyrotechnics (if the latter were a safe option at all) could prove to be as disturbing to local residents as the gulls themselves.

6.1.2 Use of birds of prey

The flying of falcons has been used to scare gulls from sites such as airport runways, although this is generally only considered an effective deterrent to gulls if they are flown at least daily (Belant 1997). The flying of hawks appeared to reduced the proportion of gulls (predominantly Lesser Black-backed Gulls) present in Dumfries that actually bred in 1999 but the effect, if this was actually due to the hawks, was not long lasting, suggesting that the birds became habituated (Coulson & Coulson 2000), or that some other factor was responsible for the lower proportion of birds breeding in 1999. Other scaring devises such as flags and using effigies of predators (*e.g.* model owls and balloons with 'exaggerated' large eyes) have been considered ineffective in that gulls can readily become habituated to their presence (Belant 1997, Rock in prep., Wellpark Action Group, pers. comm.).

Some falconers that use birds of prey regularly for bird control work suggest that, in order to disturb gulls in an effective manner, a bird of prey that can be trained to look as though it is hunting but not to kill birds, and that flies high, is likely to be most effective, as such a bird can avoid the aggressive 'mobbing' behaviour that gulls direct at predators and also deter gulls from a wider area (I. Whittaker, pers. comm.). On these criteria, it is suggested that falcons are likely to more effective than hawks,

and Peregrine/Saker hybrids have been suggested as one of the most effective type of birds to use (I. Whittaker, pers. comm.).

The study of disturbance techniques at landfill sites (Section 6.1 above; Baxter 2004) allowed a comparison of the effectiveness of falcons and hawks to be made. For falcons, the percentage reduction in bird numbers feeding at landfills sites varied between 70% and 86%, depending on whether the deterrence was in place during operational hours only or continuously from dawn to dusk (15 trials in total). For hawks, the different timing scenarios appeared to make little difference to the percentage decrease in bird numbers, which varied between 43% and 47% (12 trials in total). The study concluded that the use of falcons contributed significantly in reducing the need for other systems and also reduced the risks of habituation. The limited number of failures in deterrence occurred when falcons strayed off-site or could not be flown during poor weather (Baxter, 2004).

In general, all those with whom we communicated advocated that birds of prey must be flown daily, over a prolonged period of the breeding season (to deter breeding birds) or a large part of the year (to deter birds at landfills), and that further work is required in subsequent years to produce a long-term effect but none of these suggestions has been tested rigorously via suitably designed studies. The use of Harris Hawks has been reported as being effective in flushing birds from buildings, which can then be secured or protected (I. Whittaker; S. Towell pers comm.).

In 2004, some deterrence work with falcons was carried out for the first time at Tarnbrook gull colony in Lancashire, the site of long-term control work on the breeding gulls and at which rigorous counts of breeding numbers have been made on an annual basis (*e.g.* Coulson et al. 1991; Sowter 1999 - 2004). Visual observations suggested that the number of breeding gulls present was reduced when falcons were operational and that the density of nests was lower in those areas where falcons were flown (D. Sowter, pers. comm.). It is not clear at present whether the use of falcons actually reduced the number of nests in these areas, however, because some nest removal work was conducted simultaneously over the same areas. Nevertheless, the use of falcons is seen as a promising deterrence technique at this gull colony and further research is planned for future years (D. Sowter, pers. comm.).

From our searches of the literature, discussions with Local Authority representatives in Scotland, and some of their falconer contacts, there appear to be no rigorous studies of the true effects of the flying of hawks or falcons on breeding gulls or gulls using urban areas. Practical considerations when considering using falcons to deter gulls in urban environments will include the public perceptions of (and any real) risk of injury to the bird of prey or the target gulls, the availability of suitable elevated locations from which to fly the birds, and the risks (and public/stakeholder perceptions of risk) to other potential target species, notably racing pigeons. Knowledge of local pigeon race routes and training areas might be important in this context. Some organisations with extensive experience of flying birds of prey (such as the National Birds of Prey Centre in the UK) clearly view the use of birds of prey to control problem bird species in urban areas as inappropriate, for reasons relating both to the safety of the birds of prey themselves and to their likely effectiveness (*e.g.* see www.nbpc.co.uk/control.htm for further information on such concerns).

6.1.3 Human disturbance

Following the trialling of various intensive methods (and combinations of methods) to disturb nesting gulls from the Abbeystead gull colony on moorland in Lancashire, it was felt that disturbance by humans was the most successful of the non-lethal techniques tested and was subject to the habituation that occurred rapidly with other methods (J. Coulson & M. O'Connell pers. comm.). The technique involved the presence of humans in the colony for virtually all the day-light hours from early March to the end of May and over three years has totally cleared (in combination with some localised culling of more persistent individual gulls) about 90% of a target area containing around 15,000 large gulls (J. Coulson & M. O'Connell pers. comm.). In 2004, these human disturbance methods were used on gulls in parts of the centres of South Shields and Sunderland, using hydraulic platforms to reach some sites (and birds of prey as additional disturbance in some areas) in South Shields. Control areas that were free from disturbance were also monitored. Counts of gulls in the treatment and control areas suggested that in South Shields these techniques reduced the gull population by 70% in one year (J. Coulson pers. comm.). None of this work has been published to date to allow us to evaluate the potential of the techniques for more general application however.

6.2 Manipulation of nesting areas

A range of methods and devices have been designed specifically for excluding gulls from nesting areas, such as buildings, but there are few rigorous studies to assess the effectiveness of the different techniques in limiting access or breeding, or that address the areas to which any gulls that are excluded are displaced.

6.2.1 Methods for preventing access, landing or nesting

Suspended monofilament lines have successfully prevented gulls from occupying established nest sites (Blokpoel & Tessier 1983, Morris *et al.* 1992, Blokpoel *et al.* 1997), and along with suspended wires, also from landing on small areas of open water (Ostergaard 1981, Blokpoel & Tessier 1984). Experience with excluding Ring-billed Gulls from 'natural' nest sites in the Great Lakes region suggests that the effectiveness of such approaches can be influenced by the colour and visibility of the nylon lines used, and also by the size of colony and how long it has been established (Maxson *et al.* 1996): bright coloured nylon string was slightly more effective than monofilament at deterring gulls, and birds in larger, established colonies with a history of successful breeding were less likely to be deterred.

Even where effective, a general problem with erecting lines or wires is the potential for gulls, and also non-target species, to become entangled within them. Outside of urban areas, judicious spacing of lines has been shown to permit the entry of smaller non-target species, for example waders and terns that gull exclusions have aimed to encourage (Morris *et al.* 1992) but some individuals can still become entangled (Maxson *et al.* 1996). It is established that collision risks for birds on overhead wires or fencing can be reduced through marking to make the obstructions more visible (*e.g.* Janss & Ferrer 1998, Baines & Andrew 2003). Marking lines that have been placed to exclude gulls could reduce collision risks in a similar manner and potentially make

the devices more effective at deterring gulls, but such marking (such as the use of 'flags') can add to weight and wind resistance, reducing the resilience of the barriers in exposed positions.

When used specifically in urban areas, the practicality of physical barriers will depend on whether effective arrays of wires or lines can be attached securely in areas where gulls nest or might potentially nest. On flat roofs, any array of lines will need to be extensive to effectively deter nesting gulls: for ground nesting gulls, parallel lines spaced at 16 metre intervals were shown to effectively excluded Herring Gulls but the smaller Ring-billed Gulls (comparable in size to Common Gulls) were thought to require a spacing of less than 6 metres (Belant 1997). The height of lines above the surface appear to be of lesser importance, although any structures present above the lines might be used for landing so that gulls can subsequently walk under lines to nest sites. The use of netting as an alternative to lines or wires can exclude gulls from nesting from appropriately treated sites (*e.g.* Coulson & Coulson 1999-2003, Rock in prep), but problems with collisions and entanglement might remain if these are poorly installed or maintained (Rock in prep).

The physical blocking of nest sites in urban areas may prove successful locally in that gulls are excluded from a single building or part of a building. Several Local Authorities in Scotland reported success in the use of such techniques to exclude gulls from nesting on buildings (*e.g.* Dundee City, Aberdeen City, Dumfries & Galloway) and that the techniques were almost 100% successful if the design and placement of the devices were correct for each specific building. Bendy plastic spikes have also been used with success to deter Lesser Black-backed Gulls from nesting in a housing estate in Kilmarnock, by placing these at precise favoured nesting locations on approximately one-fifth of the houses and bungalows on the estate (Wellpark Action Group, pers. comm.; see section 3.8). Wires placed on the roofs of warehouses in Dumbarton have also been reported as successfully excluding almost 500 pairs of breeding gulls (I. Gibson, pers. comm.).

The high levels of site tenacity shown by many gulls to their breeding sites (see Chapter 5) mean that exclusion of individual pairs from a building, or group of buildings, may simply lead them to settle on neighbouring buildings as long as suitable nesting sites are available there. For such techniques to be effective across the scale of even a small town, gull excluders may need to be erected, and importantly maintained, to cover all potential gull nest sites over a wide area. There are many practical problems to overcome if Local Authorities wish to achieve such coverage, including the major ones of gaining access to private properties, health and safety considerations and cost (including who pays for the work; see Chapter 7 also for legal issues). The physical blocking of nesting sites with netting or spikes in Dumfries was not extensive enough to restrict either the numbers or the distribution of the (mostly Lesser Black-backed) gulls breeding there (Coulson & Coulson 2000).

6.2.2 Manipulation of the nesting substrates

The manipulation of the substrates on which gulls chose to nest has been tried with varying success. Mowing grass deterred Silver Gulls in Australia (Smith & Carlile 1993) and may be successful for local control of Lesser Black-backed Gulls within some colonies in Britain (*e.g.* Inchcolm in the Firth of Forth, J. Calladine, pers. obs.).

Although this technique may be an option for gulls nesting on ‘natural’ substrates within urban areas, it is clearly not an option for deterring roof-nesting gulls. In Tasmania, covering causeways where Silver Gulls nested with netting and bitumen to make them smooth was unsuccessful at deterring breeding gulls (Skira & Wapstra 1990): that study may have parallels for roof nesting gulls, especially those on flat roofs. Some Local Authority representatives in Scotland reported anecdotal evidence that changing the colour of roofs or the material of which they were made (which could also influence their thermal properties) deterred breeding gulls but this had not been tested rigorously and the effect not consistent between sites and species. For example, the replacement of corrugated asbestos roofs on warehouses in Glasgow with flat roofs of stainless steel was believed to have prevented Lesser Black-backed Gulls from nesting successfully because their nests were washed away (I. Gibson, pers. comm.) but such flat steel roofs appear not to deter Herring Gulls from nesting in Aberdeenshire (C. Campbell, pers. comm.). Clearly further details of the context of such changes are essential in interpreting any suggested effects or differences between locations and species.

6.2.3 *Creation of alternative nesting areas*

Although rarely tested for gulls, it may be possible to encourage urban colonies to switch breeding areas so that colonies are concentrated at sites where there is less perceived conflict with human interests. Such a process would probably need to involve: (i) creation of suitable nesting habitat (suitable substrate in a setting that rendered nesting areas free from ground predators; see 6.2.2 above) in a location away from human interests; (ii) pro-active attraction of the gulls to the area, perhaps with the use of decoys/sounds; and (iii) use of suitable methods (see other sections of Chapter 6 and Table in section 8.2) to disturb gulls from current breeding locations that are perceived to be problematic.

6.3 **Manipulation of food sources**

The overall availability of all food sources (both natural and human-generated) within or close to urban areas must be a contributory factor influencing the distribution and abundance of urban gulls, as this is an essential requirement for survival and reproduction (see also Chapter 5). Equally, reductions in the availability of food have been implicated in the observed declines of Herring Gulls and Lesser Black-backed Gulls at several ‘natural colonies’ that have been studied (*e.g.* Bergman 1982, Pons 1992, Perrins & Smith 2000) and are speculated to have had a wider impact at the population level in Britain and Ireland (Mitchell *et al.* 2004). Although no studies rigorously quantify the diet of urban gulls in Britain, it is widely perceived but not substantiated that garbage, both at tips and as litter in streets (*e.g.* remains of take-away food), is important (see Chapter 3).

The importance of refuse tips for providing food for gulls appears to vary geographically (or with a complex interaction of factors that may be area-, colony- and species-specific), with some studies showing them to be a major food source (*e.g.* Davis 1974, Mudge 1978, Mudge & Ferns 1982, Sibley & McCleery 1983a), while others suggest that they are a less preferred alternative to ‘natural’ food and of relatively minor importance (*e.g.* Kihlman & Larsson 1974, Coulson *et al.* 1987). The

importance of refuse in the diet can also differ between individuals, with some specialising in garbage (*e.g.* Sibley & McCleery 1983a,b), and the use of such discards can also vary seasonally (Belant *et al.* 1993).

The elimination of garbage as a food source for gulls in urban areas is likely to be effective only in the absence of suitable alternative food supplies within a suitable ranging distance and, clearly, this is likely to vary between specific locations. In one study, Herring Gulls showing specialised feeding preferences, such as for garbage, were found to select other similar sites for feeding when one foraging site became unproductive (McCleery & Sibley 1986), so that 'garbage specialists' may be expected to look for other such food sources if one site is removed. Along an urban stretch of the River Tyne in northeast England, the combined number of six species of gulls declined concurrent with a reduction in food available in the form of untreated sewage (Raven & Coulson 2001), although responses by the different species varied: numbers of Lesser Black-backed Gulls and Kittiwakes increased, while numbers of Herring Gulls did not change significantly. The differences in response to the reduction in sewage waste were attributed to differences in the ecology and breeding status between the species in the area, implying that the simple removal of one food source (albeit an apparently important one) need not necessarily lead to declines in the numbers of all gulls where alternative food resources are available.

During a two-week programme of deterring gulls (predominantly Herring Gulls and Lesser Black-backed Gulls) from a land-fill site near Gloucester in March 2004 using trained falcons and pyrotechnics, based on counts of birds and resighting of colour-ringed individuals, about two-thirds of the displaced gulls were found at other nearby landfill sites, while the remainder found different food sources (such as on agricultural land or in intertidal areas; Rock 2004). Although, only a short-term study and conducted before egg laying, when the birds were less likely to have strong ties to the feeding areas closest to their nesting areas, this study again demonstrates the apparent ease with which gulls may switch to alternative feeding sites and food types.

The control of urban gull colonies through limiting food availability does appear to be an option worthy of fuller investigation. In order to predict the likely effects of action to limit the food availability of birds at any given colony, it would be necessary to have knowledge of (i) the current food sources used by the gulls, (ii) the likely limits to the foraging range of the species (on which some information already exists, although not for urban-dwelling gulls; Chapter 5), and (iii) all other potential food sources within the likely foraging range, even if these appear not to be of current importance (there is data available on the diets of gulls from some studies but few for urban-dwelling birds; Chapter 5). Even with the above information assembled, well-designed field studies that monitor the effects of experimental manipulation of the food sources of urban gulls will be required to test the assumptions made and refine the prediction process.

6.4 Restriction of breeding success

Gulls are relatively long-lived bird species, with estimated annual survival rates for Herring Gulls (from natural colonies) ranging from 88% to 93.5% (Chabrzyk & Coulson 1976, Coulson & Butterfield 1986, Migot 1982, Wanless *et al.* 1996) and for

Lesser Black-backed Gull and Black-headed Gull, 91% and 82-89% respectively (Wanless *et al.* 1996, Lebreton 1994). Thus aside from any potential deterrence effect caused by disturbance at breeding colonies through these control measures (Section 6.1), the longevity of adults and also the 2-4 year period of immaturity before breeding (Chapter 5) will tend to make control via the restriction of breeding success a lengthy process. Some studies, for example one on the Isle of May, suggest that the colony of Herring Gulls there was limited effectively by restricting reproductive output, although this was not as successful for Lesser Black-backed Gulls (Wanless *et al.* 1996). The difference in response between species may have been due to the generally greater mobility of Lesser Black-backed Gulls (Chapter 5), although Wanless *et al.* (1996) found no direct evidence to support such an hypothesis. On a wider scale, it is also strongly suspected that traditional egg collecting by humans limited some gull colonies in Britain until at least the 1950s (*e.g.* Davis 1974, Lloyd *et al.* 1991). Therefore persistent and long-term control measures to limit breeding success could potentially be effective for some sites and species, but effectiveness is likely to depend on several factors, notably choice of an effective treatment method, thorough control (treatment of a high proportion of nests) and low levels of immigration from other productive colonies: the presence of adult birds at a site, even with a small number only rearing young, might still attract some potential recruits from other sites (see Section 5.4).

The largest documented control programme that used restriction of breeding output as a principal control measure was carried out in Maine, USA from 1940-1952, during which time around 800,000 Herring Gull eggs were sprayed with oil (Kadlec & Drury 1968). Breeding numbers began to decline 4-5 years after the programme started, coincident with the expected recruitment year of the first cohort to which control was applied. Although rates of decline were at times greater than that expected if adult mortality alone was responsible (25-30% per year, suggesting additional disturbance effects leading to redistribution of both breeding adults and a reduction in recruitment), the programme ended because it was not felt to be achieving its aims over a wide enough area and also for financial reasons (Kadlec & Drury 1968, Thomas 1969).

6.4.1 Treatment or removal of eggs or nests

Methods of limiting or preventing successful breeding that have been documented include the removal or destruction of eggs and chicks, puncturing, shaking eggs or injecting eggs to kill the embryo, and coating eggs with oil (such as paraffin) to suffocate the embryo. Gulls can lay replacement clutches following the destruction or removal of eggs (*e.g.* Harris 1964, Vermeer *et al.* 1991), necessitating repeat visits to destroy or remove eggs, although the frequency of relaying is reduced if eggs are destroyed late during incubation (Nisbet & Drury 1972), and the same applies if chicks are destroyed.

The treatment of eggs to prevent them from hatching (whilst leaving the nest and eggs intact) will generally prevent gulls from relaying and thus reduce the need for repeated treatments per nest, as long as the birds continue to incubate the treated eggs. Repeated visits to a colony will normally still be necessary if the aim is to treat all eggs, however, due to the variation in egg laying dates that is likely to occur. Eggs that have been treated by puncturing can sometimes be recognised by incubating

gulls, leading to their rejection and subsequent relaying (Corkhill 1970). Methods that result in the death of embryos within eggs, although generally more time consuming per treatment, largely eliminate the problems associated with gulls relaying fresh clutches. Such treatments include vigorous shaking, injection with an embryonicide (e.g. formalin), or coating eggs with oil to prevent gases moving through the eggshell and thereby suffocating the embryo (Kadlec & Drury 1968, Thomas 1972, Blokpoel & Hamilton 1989, Christens & Blokpoel 1991).

In the Scottish context, a number of Local Authorities have used the treatment or removal of eggs or nests to limit numbers of breeding gulls in a manner that they have perceived to be successful in achieving their individual aims. For example, nest removal followed by proofing has been perceived as successful in limiting breeding numbers on a housing estate in Kilmarnock (see section 3.8), in limiting breeding numbers in some areas of East Lothian (F. Mackay, pers. comm.) and in reducing the breeding colony size in Eyemouth (D. Watney, pers. comm.), although detailed counts of the changes in breeding numbers are not available in these cases to allow us to provide a fully quantitative scientific appraisal of the effects.

6.4.2 Introduction of predators

The introduction of nest predators, as a potential alternative method for controlling breeding productivity, has been used successfully on some island gull colonies in North America (using foxes, racoons or pigs; Kadlec 1971, Belant 1997). Such an approach often has limitations in that non-target species can also be taken by the predators and the predators will require alternative food if they are to remain in the long-term and prevent gulls from recolonising. In urban areas, where predators of eggs and chicks, such as rats and cats, are generally abundant in any case, it is likely that gulls will be nesting in areas that are largely inaccessible to them in the first place and hence this is unlikely to be a suitable option for the control of urban gull colonies.

6.4.3 Contraception

In principal, contraceptive techniques could be used to restrict the breeding success of gulls and may have applications in future. Immuno-contraception, via baits and vectors (which are likely to be the only practical options), is undeveloped as a technology currently, however, and its ecological application has not been tested appropriately (Barlow 2000). One Local Authority in Scotland provided us with information on an attempt to control urban pigeons in Venice using contraceptive techniques but it was concluded that this is not an effective control option (for further information see:

http://www.aberdeencity.gov.uk/acc_data/committee%20reports/cs_env_r4_4_040907.pdf). Even if suitable contraceptive drugs become available, it may prove difficult to control the level of drug intake by gulls, however, because they 'rush feed', which would be likely to lead to overdose and potentially adverse or even lethal effects (J. Coulson pers. comm.).

6.5 Removal of adult birds

The live capture and transportation of fully grown gulls away from problem areas is potentially practical, although relocated gulls would probably (or even certainly) return to the area of capture (Belant 1997); hence this is unlikely to be a useful control method except perhaps for the removal (to a large distance from the colony) of isolated 'problem' birds or pairs. The effective removal of adult birds from a colony is likely to necessitate killing them.

Due to the generally high survival rates of adult gulls and their delayed maturity (age of first breeding; Chapter 5), the culling of breeding adults will invariably have a more immediate effect on numbers than control methods aimed solely at restricting breeding output. A number of gull culls have been well documented and have proven to be an effective means of controlling some local breeding gull colonies (*e.g.* Thomas 1972, Wanless & Langslow 1983, Coulson *et al.* 1982, Coulson 1991). Amongst the documented culls, narcotic bait (typically alpha-chlorolose) placed by nests has been used widely. The territorial nature of nesting gulls permits the targeting of specific nests, species or areas using this approach.

One of the best documented large-scale culls of breeding gulls was carried out on the Isle of May in the Firth of Forth, where over 40,200 Herring Gulls and 5,300 Lesser Black-backed Gulls were removed: a combined colony of over 17,000 pairs of gulls in 1972 was reduced to between 2,500 and 3,000 pairs (Wanless & Kinnear 1988, Coulson 1991). Associated with the reduced colony size, some changes in the demography of these Herring Gulls were recorded: the age of first breeding declined and natal philopatry increased during the following period when culling was carried out at a lower level (Duncan 1978, Coulson *et al.* 1982, Coulson 1991). These changes were interpreted as density-dependent responses that tended to compensate for the increased mortality due to culling and to some degree mitigated against the effectiveness of the cull. However, in addition to the removal of gulls killed during the cull, there appeared to be an additional influence on recruitment with up to 6,000 individuals (young reared on nearby undisturbed colonies) potentially deterred from settling to breed on the Isle of May (Coulson 1991). During the culls, breeding success was obviously low, in that breeding adults were systematically killed. It follows that if recruitment can be influenced by performance-based conspecific attraction (Section 5.4), then a colony undergoing an effective cull of breeding adults is likely to be less attractive to potential recruits.

An alternative to killing gulls at breeding colonies is to target them at feeding sites, such as refuse dumps. Here there may be more potential to trap and kill, shoot or poison concentrations of birds (*e.g.* Hakkinen & Nummelin 1980). The local breeding birds that survive might also become deterred by the disturbance caused by either trapping or shooting, however, and learn to avoid the feeding areas where such activities are undertaken, such that only a proportion of the colony is removed. For this reason, poisoning or narcotising at feeding sites may be a more effective alternative, although it need not necessarily target a high proportion of gulls breeding in urban areas (see section 5.5). Botulism poisoning, whereby gulls inadvertently ingest a toxin produced by the bacterium *Clostridium botulinum* that is associated with some rubbish tips (particularly during warm weather), has been implied as a causal factor for some observed declines of Herring Gulls and Lesser Black-backed

Gulls (*e.g.* Ferns 1984, Sutcliffe 1986, Madden & Newton 2004). It follows that deliberate poisoning at feeding sites may potentially be an effective method for control. Such approaches will not be selective in terms of the breeding origins of the individual gulls (could target urban and non-urban breeders in the absence of existing information on the origins of birds using any given feeding site) however. The likelihood of affecting non-target species will also generally be greater at feeding sites than at nest sites.

6.5.1 *Use of narcotics*

Narcotic baits, such as alpha-chlorolose, do not generally kill birds immediately on ingestion but, rather, result in ‘drowsiness’ and death over a period of hours. In practice, where baits are administered at colonies, access needs to be restricted to prevent disturbance and to maximise the proportion of birds that die whilst sitting on or close to nests. Carcasses can then be removed and appropriately disposed off. If disturbance to the colony occurs, gulls that have ingested baited food may fly away and die elsewhere. The control of gulls in urban areas using narcotic baits at nests is only likely to be practical in situations where (i) access to nest sites is possible (for placing the baits), (ii) baited areas can be sealed from human disturbance temporarily and (iii) carcasses can be cleared up for disposal. Such criteria are unlikely to be met in city centres or residential areas but such techniques might be practical on some industrial sites with restricted public access.

The use of alpha-chlorolose to cull gulls in a urban setting has been documented by Scarborough Council (see presentation by T. Fenter at the Gloucester Urban Gulls Conference: <http://www.gloucester.gov.uk/libraries/templates/page.asp?URN=2162>, which gives further details on the summary that follows here). Roof nesting was first recorded in Whitby in 1942 and Scarborough in 1967. The Council carried out a programme of control, initially using egg pricking and substitution, but from 1976-1990 using narcotic bait. Between 1978 and the late 1980s, the combined population of gulls in Scarborough, Whitby and Staines decreased from 1400 to 500. Some property owners refused the Council access to cull gulls, so that complete clearance was not possible, and the culling also led to protests from the ‘animal rights’ movement (J. Coulson, pers. comm.). In 1991, the culling was abandoned for a number of reasons (including the lack of cost effectiveness) and control is now primarily by nest clearance. After the abandonment of culling, the gull population increased again (peaking at *c.*3000 in 2001 and now standing at *c.*2750). The Council was refused permission for a licence to resume use of narcotic baits and now clears nests and eggs from buildings on request, provides proofing materials at cost, gives advice and guidance on gull control, and is advocating the need for a national strategy to control gulls.

6.5.2 *Shooting*

The shooting of gulls at breeding colonies, as well as targeting breeding birds, may also eliminate potential recruits (young birds attending colonies) and potentially also scare birds away through disturbance (Section 6.1). The shooting of gulls has been proven effective as a control measure on some small islands (*e.g.* Casey *et al.* 1995) and is also reported to have been effective at reducing or eliminating some colonies of Lesser Black-backed Gulls on moorland (Calladine 2004). Issues of access and safety

are obviously likely to limit the use of shooting within urban areas, however, and, as with all control measures, it is essential that appropriately licensing is in place (Chapter 7), Police advice is sought and guidance followed. The perceptions of the public to the use of shooting in urban areas must also be a major factor when considering the use of this control technique.

7 Review of the legislation surrounding control of urban gulls

This chapter provides a brief review of the legislation surrounding the measures that could potentially be used to mitigate against the perceived urban gull problems in Scotland. Each area of legislation that has the potential for utility in addressing perceived gull problems is outlined, together with areas of uncertainty and any measures that we took during this project to get further advice on key aspects. This is a specialist area of research, in which the authors did not have specific expertise from which to offer guidance, however. Rather, we have attempted to provide pointers towards issues that might merit further legal advice (see also Section 3.6 on the perceptions of Scottish Local Authorities of legislation and Section 8.3 for a summary of further research priorities). This section should be used as a source of guidance only: the wording used here does not necessarily reflect that of each act, and interested parties should refer to the full legislation documents and their wording (we have provided web references for these below wherever possible) and seek appropriate legal advice on these issues.

7.1 Legislation to protect wild birds in Scotland

The protection of wild birds in the UK was covered by the **Wildlife and Countryside Act 1981**, which is underpinned by the European Union (EU) **Birds Directive (79/409/EEC)**. The requirements of the Birds Directive to protect, manage and control all species of naturally occurring wild birds were met by the relevant sections of the Wildlife and Countryside Act (WCA)1981. In Scotland, the WCA 1981 has been amended recently by the Nature Conservation (Scotland) Act 2004 (see:<http://www.opsi.gov.uk/legislation/scotland/acts2004/20040006.htm>).

Subject to the provisions of Part 1 of the amended WCA1981, it is an offence under Section 1 of the Act if any person intentionally or recklessly:

- kills, injures or takes any wild bird;
- takes, damages, destroys or otherwise interferes with the nest of any wild bird while that nest is in use or being built;
- at any other time, takes, damages, destroys or otherwise interferes with any nest habitually used by any wild bird included in Schedule A1;
- obstructs or prevents any wild bird from using its nest; or
- Takes or destroys an egg of any wild bird.

In addition to the three actions listed above, Article 5 of the Birds Directive also states that Member States should prohibit:

- Deliberate disturbance of any wild bird particularly during the period of breeding and rearing, in so far as disturbance would be significant having regard to the objectives of this directive; and
- Keeping birds of species the hunting and capture of which is prohibited.

Under Section 5 (1) of the amended WCA 1981, the use of certain methods for killing or taking wild birds is also an offence (refer to the Act for details of these methods).

Section 16 of the amended WCA 1981 gives the power to authorities (The Scottish Executive in Scotland, since devolution) to grant licences that permit the killing and taking of wild birds for certain reasons, however, when there is no other effective solution and on a selective basis and in respect of a small number of birds. The amended WCA 1981 also gives these authorities the power to amend the list of prohibited methods of killing or taking wild birds, by adding methods to, or omitting methods from the list. The availability of these additional powers stems from Article 9 of the Birds Directive, which states that Member States may derogate from the provisions of Article 5 (the killing and taking of wild birds or their eggs or nests) for certain reasons:

- in the interests of public health & safety;
- in the interests of air safety;
- to prevent serious damage to crops, livestock, forests, fisheries, and water;
- for the protection of flora & fauna;
- for the purposes of research and teaching, of repopulation, of re-introduction and for the breeding necessary for these purposes; or
- to permit, under strictly supervised conditions and on a selective basis the capture, keeping or other judicious use of certain birds in small numbers.

Note that there is no provision to derogate from either the provisions of the EC Birds Directive or the amended WCA 1981 on the basis of noise, or damage caused to human property by gulls or their droppings (see section 3.6; see also section 7.4 below relating to gull noise and droppings and any human health risk).

7.1.1 General Licences

The Scottish Executive has issued four ‘General Licences’ in respect of the killing or taking of certain wild bird ‘pest’ species, including Great Black-backed Gull, Lesser Black-backed Gull, and Herring Gull. Other species of gull are not covered by the licences, with the exception of licence SEGEN/13 (below). The four General Licences in operation in Scotland currently are as follows:

- Licence SEGEN/10 authorises for the purposes of protecting any collection of wild birds and for the purposes of preserving public health or public safety or air safety any authorised person to kill or take gulls by shooting or by the use of a cage trap or net, or by any other method not prohibited by Section 5 (1) of the Wildlife & Countryside Act 1981; or to take, damage or destroy their nests; or to take or destroy their eggs.
- Licence SEGEN/22 authorises for the purposes of preventing the spread of disease and for the purposes of preventing serious damage to livestock, foodstuffs for livestock, crops, vegetables, fruit, growing timber, fisheries and inland water to kill or take gulls by shooting or by the use of a cage trap or net, or by any other method not prohibited by Section 5 (1) of the Wildlife & Countryside Act 1981; or to take, damage or destroy their nests; or to take or destroy their eggs.

For licences SEGEN/10 and SEGEN/22, an authorised person means:

- The owner or occupier, or any person authorised by the owner or occupier, of the land on which the action authorised is taken;
- Any person authorised in writing by the Local Authority for the area within which the action authorised is taken;
- Any person authorised in writing by any of the following bodies – Scottish Natural Heritage, a water authority or any other statutory water undertakers, or a district board for a fishery district.
- Licence SEGEN/13 (in addition to SEGEN/10), authorises an aerodrome manager or any person authorised by him to kill or take wild birds of the species *Larus ridibundus* (Black headed Gull), *Larus canus* (Common Gull) and *Vanellus vanellus* (Northern Lapwing) within the area bounded by the perimeter of the aerodrome, and to take and destroy their nests within that area. Three other species of wild bird are listed with regard to specific airports owned or leased by the Highlands and Islands Airports Limited, Civil Aviation Authority or the Ministry of Defence and these are *Haematopus ostralegus* (Eurasian Oystercatcher), *Anser anser* (Greylag Goose) and *Numenius arquata* (Eurasian Curlew).
- Licence SEGEN/23 authorises for the purposes of preserving public health or public safety or air safety, or preventing the spread of disease and for the purposes of preventing serious damage to livestock, foodstuffs for livestock, crops, vegetables, fruit, growing timber, fisheries, to kill gulls with the use of a semi-automatic weapon by licensed authorised persons.

These General licences are issued on an annual basis and do not require any specific application to be made to the Scottish Executive. Unless a person acts in accordance with the terms of any of these licences and for a purpose for which the relevant General Licence was granted, he/she commits an offence.

7.1.2 *Specific Licences*

The Scottish Executive will consider applications to use a method prohibited under Section 5 (1) of the amended Wildlife and Countryside Act 1981 if a problem arises that cannot be satisfactorily resolved by a method permitted under one of the General Licences. In the context of methods of potential use in the control of urban gulls, the use of poisonous substances (*e.g.* paraffin oil for egg oiling) or stupefying baits fall currently into the category of requiring application to the Scottish Executive for a ‘Specific Licence’.

7.2 **Legislation surrounding littering and waste**

7.2.1 *Environmental Protection Act 1990 (c. 43)*

Part III Statutory nuisances & Clean Air

The Environmental Protection Act (EPA, available at:

http://www.opsi.gov.uk/acts/acts1990/Ukpga_19900043_en_1.htm) 1990 enables

Local Authorities and individuals to take action to secure the abatement of a ‘statutory

nuisance'. Section 79 of the EPA sets out what can and cannot be defined as a statutory nuisance and does not make special provision for noise/nuisance from any type of animal unless it is being kept in such a place or manner as to be prejudicial to health or a nuisance (see also the SCIEH guidance document on this at: <http://www.show.scot.nhs.uk/scieh/environmental/enviropdf/StatutoryNuisance.pdf>).

Part III of EPA 1990, as amended by the Environment Act 1995 Section 107, provides the current regulatory regime in Scotland for statutory nuisance. A statutory nuisance can include "premises in such a state as to be prejudicial to health or a nuisance" and "any accumulation or deposit which is prejudicial to health or a nuisance". If a statutory nuisance "exists, or is likely to occur or recur", Local Authorities can serve an Abatement Notice, requiring steps to be taken to abate the nuisance. Failure to comply with an Abatement Notice is an offence.

We have been unable to get conclusive advice on whether the definitions of statutory nuisance could be used (i) to enforce owners to proof building against gulls, (ii) to prevent individuals providing large amounts of food to gulls or other wild birds, such that droppings build up to substantial levels.

Part II Waste on Land

In the event that waste is stored outside a receptacle on any domestic premises (Part II Section 46) commercial or industrial premises (Part II Section 47), and is judged likely to cause a nuisance or be detrimental to the amenity of an area, the local authority, as Waste Collection Authority, has the power to issue a Notice. The Notice will require the occupier of the premises to provide at the premises, receptacles for the storage of waste, of a kind and number specified, and also specify the steps to be taken by occupiers of premises to facilitate the collection of waste from the receptacles.

Part IV Litter and related issues

Part IV of the EPA 1990 sets out legal provisions relating to litter. It does not provide a definition of litter as such, but rather defines the offence of littering as the throwing down, dropping or otherwise depositing and leaving of any thing in such circumstances as to cause, contribute to, or tend to lead to, the defacement by litter of a place to which the legislation applies. According to Defra (1999), 'litter' has a very wide interpretation, including wrappers, cans, bottles or packaging, food, small items (such as cigarette ends) and large items (such as bags of rubbish). Part IV can therefore be applied to the action of fly-tipping as well as littering, where the fly-tipped waste is deposited on places to which the litter legislation applies.

Section 88 of Part IV gives provision for fixed penalty notices for littering. The EPA has been amended with respect to littering and fly-tipping by the Antisocial Behaviour Act 2004 (Section 55). Councils, police and authorised officers of a waste regulation authority (*i.e.* SEPA) are able to issue fixed penalty notices (currently set at £50) for littering. In order to issue a notice, these officers will need to have "reason to believe an offence has been committed". In relation to fly-tipping, Councils and SEPA officers are able to issue notices.

Section 93 of Part IV gives provision for Street Litter Control Notices to prevent accumulations of litter in and around premises. The EPA has been amended with

respect to street litter by The Street Litter Control Notices Order 1991. Under the Street Litter Control Notices Order 1991 (as amended), these types of premises include, *inter alia*, premises used for the sale of food and drink. The occupier is responsible for keeping the front of the premises and a reasonable distance on either side (100m for fast food outlets) free from litter.

7.2.2 *Environment Act 1995 (c. 25)*

This is of relevance in relation to the amendment of the EPA 1990 Part III (Section 7.2.1 above), and available at:

http://www.hmso.gov.uk/acts/acts1995/Ukpga_19950025_en_1.htm .

7.2.2 *Antisocial Behaviour etc (Scotland) Act 2004*

This act is of relevance in relation to the amendment of the EPA 1990 Part IV (Section 7.2.1 above), and available at: <http://www.opsi.gov.uk/legislation/scotland/acts2004/20040008.htm> . The definition of ‘antisocial behaviour’ is given as “acting in a manner or pursuing a course of conduct that causes or is likely to cause alarm or distress”. Antisocial Behaviour Orders (ASBOs) may be sought from the Courts by Local Authorities. The largest use of ASBOs has been in relation to disorder on housing estates: for example, in 2003/04, 94% of applications for ASBOs were in respect of offences committed ‘in residential areas near perpetrators homes’ (Scottish Executive, pers. comm.). To date, we are aware of one Local Authority only (Fife) that has applied for an ASBO to prevent a member of the public from feeding gulls (C. Morrison, pers. comm.). It is hoped that in the future, however, such use of legislation is not necessary and that education and persuasion can be used to prevent excessive feeding of gulls (C. Morrison, pers. comm.).

7.2.4 *The Street Litter Control Notices Order 1991*

This is of relevance in relation to the amendment of the EPA 1990 Part IV (Section 7.2.1 above), and available at:

http://www.opsi.gov.uk/si/si1991/Uksi_19911324_en_1.htm .

7.2.5 *Town and Country Planning (Scotland) Act 1997*

If it appears to a planning authority that the amenity of any part of their area, or an adjoining one, is adversely affected by the condition of land in their area they may serve a Notice on the owner or occupier requiring them to remedy its condition within a certain time (under Section 179). The owner or occupier must be given 28 days notice by the planning authority and has the right to appeal to the Scottish Ministers. This document is available at: <http://www.opsi.gov.uk/acts/acts1997/1997008.htm> .

7.2.6 *The Landfill Directive 1999/31/EC*

Under this EC Directive, Member States must reduce the amount of waste going to landfill sites. The National Waste Plan drawn up by the Scottish Executive in the wake of this Directive will reduce land-filling of municipal waste from around 90% (2001/2 figures) to 30% by 2018 (see <http://www.sepa.org.uk/pdf/nws/guidance/>

national_plan_2003.pdf). This has implications for the number of landfill sites that may be in operation in the future and the local gulls that feed around these sites. The full text of the Directive was published in the Official Journal of the European Communities L182/1 on 16 July 1999 and is available on the Europa Website at: http://europa.eu.int/eur-lex/pri/en/oj/dat/1999/l_182/l_18219990716en00010019.pdf.

7.3 Legislation surrounding planning and building

Some Local Authorities include gull-proof design in their planning guidance for new buildings but current thinking suggests that this can be challenged by developers (D. Grant, pers. comm.). For example, Gloucester City Council is developing design guidance for their Planning Department/developers in relation to urban gulls and this should be available later in 2005 (M. Brentnall, pers. comm.). For some developments, Aberdeenshire Council Planning and Environmental Services Department make it a condition of planning approval that some level of mitigation is provided to prevent gulls from using the building(s), and this is assessed on a case by case basis (it may include, for example, building design conditions, the use of netting or the use of sound deterrents; D. Russell, pers. comm.).

7.4 Public health legislation issues

Derogations under the wildlife conservation legislation covering Scotland are permitted if gulls can be shown to cause a risk to public health or safety (section 7.1 above). Thus, in certain situations, for example where gulls exhibit aggressive behaviour towards vulnerable community groups (e.g. the elderly, children), there may be a case for mitigation of some form.

There are two further areas relating to public health that are often queried in relation to perceived problems associated with urban gulls: (i) risks of disease transmission (from the birds themselves or from droppings) and (ii) sleep deprivation due to noise. There are published papers relating to the carriage of *Salmonella* by gulls in the UK (Coulson et al. 1983a & b) and unpublished data from north-east England show that 50% of Herring Gull cloacal samples examined carried *Campylobacter* and around 10% carried *Salmonella* of many serotypes (J. Coulson, pers. comm.). In 2002, North Lanarkshire Council drew on advice from the Scottish Centre for Infection and Environmental Health (formerly SCIEH, now Health Protection Scotland – HPS) regarding the potential health risks posed by urban gulls. The key findings of the advice are presented on the Council's website (see: <http://www.northlan.gov.uk/living+here/public+health/pest+control/roosting+pigeons+and+seagulls+effects+on+human+health.html>). This advice notes that whilst there is a theoretical risk of infection passing from urban gulls to the human population (because of the feeding sites used by gulls and their scavenging habits), in practice any risk is likely to be very low because in general there is limited opportunity for humans to ingest an infective dose of any pathogen carried by a gull. SCIEH advised the Council that *Salmonella* spp, *Campylobacter* spp and *E. coli* 0157 have all been isolated from gulls feeding on landfill sites and that concerns have also been raised periodically about gulls roosting on school roofs or playing fields and potentially infecting these. There has been no evidence to date of any disease produced under

these circumstances however, although the Council's website notes that in such situations a specific risk assessment might be appropriate and might result in local measures to mitigate against the gulls involved. Similarly with regard to fouling with gull droppings, infectious hazards due to these are thought to be minimal: previous links with *Salmonella* and disease in livestock were associated with gulls feeding at refuse tips and at sewage outfalls and then transferring infection but standards at both tips and outfalls are believed to have improved considerably such that it would be hard to show that this risk still continues (W. Reilly, pers. comm.). There might still be some very localised instances where exceptionally high build-ups of droppings could constitute some health risk, however, and in such situations legal advice should be taken based on the specific circumstances involved.

It has not been possible for us to obtain any consensus on whether sleep deprivation due to constant noise from gulls could constitute a risk to public health. This is because there is no written definition of 'public health and safety' within the wildlife conservation legislation from which there may be a need to derogate (section 7.1). The World Health Organization (1948) has adopted within its constitution a broad definition of health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" [a definition that has not been amended since accepted in 1946; WHO 1948] but, once again, there is no consensus as to whether such a broad definition could be used to encompass sleep deprivation due to the noise caused by urban gulls.

As part of this project, we attempted to arrange a discussion meeting between ourselves and Professor George Morris (Scottish Executive) and Rod House (HPS) to further discuss any public health issues relating to urban gulls but unfortunately, this could not be scheduled before the report was required. Further discussion on the issues raised above would be of value, however.

7.5 Gulls, Management Rules and Bye Laws

Section 112 of the Civil Government (Scotland) Act 1982 gives Local Authorities the power to make Management Rules to regulate (a) the use of, and (b) the conduct of persons while on or in, and land or premises that is owned, occupied or managed by the Local Authority or is otherwise under its control and to which the public have access, whether on payment or not. This it may be possible for a Local Authority to create Management Rules to prevent the feeding of gulls that are perceived as a nuisance on land that is owned or controlled in some way by that Local Authority. Of course, there may be practical difficulties associated with this kind of approach, as the bird feeding might, for example, be targeted at other species such as ducks on a pond, where the taking of the food by gulls might be purely incidental.

If Management Rules have been tried but have failed, or have proved inadequate in scope, a Local Authority can consider the making of Bye Laws. Bye Laws are usually subject to confirmation by Scottish Ministers and it is Scottish Executive policy not to confirm Bye Laws unless Management Rules have been tried and failed.

When pigeons were perceived as a problem in London, there was some discussion about the use of legislation to deter people from feeding them. In 2003, the Mayor of

London introduced a new Bye Law that prohibited the feeding of pigeons in Trafalgar Square unless authorised by himself. A breach of this byelaw is a criminal offence punishable by a maximum fine of £50 (for further information on this specific case, see: http://www.london.gov.uk/view_press_release.jsp?releaseid=2032).

8 Best practice recommendations for mitigating problems involving urban gull colonies

One of the key aims of this study was to provide, as far as is currently possible, standard ‘best practice guidance’ for those Local Authorities that feel the need to address problems associated with urban gulls or for which this need may arise in the future. A number of Local Authorities across the UK have put together guidance documents on urban gulls containing information relevant to their local situation (see for example: <http://www.south-ayrshire.gov.uk/environmentalhealth/pc-gulls.htm> ; <http://www.sunderland.gov.uk/public/editable/themes/healthy-city/eh/pest-control/advice-re-herring-gulls.asp> ; http://www.scarborough.gov.uk/pdf/herring_gulls/herring_gull_leaflet.pdf ; <http://cardiff.gov.uk/regulatory/EnvPublicProt/pollution/pestcont/seagulls.htm> ; <http://gloucester.gov.uk/libraries/documents/e.health/ehf23.pdf> . However, the scope of such documents varies between Local Authorities and the guidance that is given is generally location specific and based largely on advice from specialist consultants, who may not be advocating it on the basis of effectiveness proved in a scientific manner.

This final chapter first outlines the (substantial) gaps in scientific knowledge in this field that exist to date, which place severe limitations on the level of specific guidance that can be given to Local Authorities or others with a desire to mitigate the problems associated with urban gulls. Next we provide as specific guidance as can be supported by rigorous scientific research on the types of situation in which the various mitigation measures that are available might prove effective, the major limitations of each technique and some specific practical considerations associated with the implementation of each in urban environments in Scotland. Finally, the principal areas of additional research that we feel are of the highest priority currently in the context of urban gull issues are outlined.

8.1 Current limitations on the provision of best practice guidance

At present, a lack of knowledge in several key areas limits the extent to which sound scientific advice can be given on the likelihood of the various mitigation methods achieving their intended aims if implemented. These key areas are as follows:

- *Lack of rigorously monitored studies of mitigation techniques*
Our reviewing (Chapter 6) identified very few studies that have attempted to monitor the effects of mitigation techniques on target gull colonies. Of the studies that have been carried out, the majority have either (i) been carried out in more ‘natural’, non-urban environments (such that the extent to which the effects shown are indicative of the likely effects in an urban setting are unknown), and/or (ii) been insufficiently rigorous in their design or interpretation (*e.g.* because several techniques were tried concurrently, because the counting methods employed were not suitable) to allow firm conclusions to be drawn.
- *Lack of information on the ecology and demography of urban gulls*

Our reviewing (Chapter 5) identified a dearth of information on the basic biology of urban gulls that is required to allow predictions of the likely wider-scale and longer-term effects of many of the available mitigation techniques. The information that is lacking can be broadly categorised as ecological data (such as diets, foraging ranges, wintering behaviour) and demographic data (survival and reproductive rates, timing of breeding, dispersal, recruitment and population mixing).

- *Lack of information key information on non-urban gulls*
Although less of a limitation than the above two areas of knowledge, more information on the reasons behind the declines of ‘natural’, non-urban gull colonies in the wider countryside in Scotland might very well assist in establishing the reasons for the increased attraction of gulls into urban environments. Although some long-term studies have been carried out on the demography and ecology of gulls at some such colonies in Scotland in the past (*e.g.* those on the Isle of May, see Chapter 5 for some key references), the focus in recent years has tended towards other seabird species.

8.2 Guidance for Local Authorities on mitigation techniques

In the following table, we list mitigation techniques that might be considered in Scotland to address problems with urban gulls. We note at the outset that there has been very little rigorous scientific research on the effectiveness of such techniques in general, and almost none on the likelihoods of most techniques being successful within urban environments (Section 8.1 above). Whether a technique is likely to produce the required effect at any given location is likely to depend on a large number of factors, and some of the key considerations are the following:

- The species of gull involved (as the species differ somewhat in their ecology, see Chapter 5);
- The seasonality of the problem (breeding season or winter months; *i.e.* the extent of site tenacity, see Chapters 4 & 5);
- The scale of the perceived problems (*e.g.* ranging from isolated aggression events to widespread fouling/littering/noise problems);
- The number of gulls involved in the perceived problems;
- Characteristics of the urban location (*e.g.* accessibility of nesting areas, public access, height and nature of buildings).

Type of mitigation technique (Report section)	Mitigation technique (Report section)	Contexts for possible effectiveness in urban Scotland	Major biological limitations	Practical application issues
Non-lethal disturbance (6.1)	Sounds (<i>e.g.</i> distress calls, bangs, sirens,)/pyrotechnics (6.1.1)	<ul style="list-style-type: none"> • Clearing gulls from relatively small areas for short periods of time; • Moving gulls to alternative sites, particularly non-breeding birds (<i>e.g.</i> disturbance at roosts to deter recruits). 	<ul style="list-style-type: none"> • Habituation to the scaring method is likely to occur; • Less likely to be effective at moving territorial breeding gulls. 	<ul style="list-style-type: none"> • Frequent changes in the position, time and type of disturbance may improve effectiveness; • In urban settings, disturbance methods may disturb humans and other non-target species.

	Use of birds of prey (6.1.2)	<ul style="list-style-type: none"> • Little rigorous documentation of success available on which to base guidance; • Falcons might be used effectively in relatively open areas (e.g. industrial areas with large flat roofs, landfill sites); • Hawks might be useful only to flush pest birds from buildings, which can then be secured; • Success less likely with territorial nesting gulls c/landfills and roosts (e.g. at airports and to deter non-breeding birds from recruiting into the breeding population). 	<ul style="list-style-type: none"> • Choice of bird of prey species is likely to be important depending on context of use; • Generally requires intensive work initially and re-enforcement over subsequent years. 	<ul style="list-style-type: none"> • Training and careful choice of bird of prey species to reduce risk of actual kills of gulls and/or other non-target species; • Relatively large areas might be “treated” by birds of prey flying, particularly falcons; • Need to start before gulls begin nesting at potential breeding sites; • Can be used with sounds / pyrotechnics but regular re-enforcement using bird of prey likely to be necessary; • Concerns specific to the urban environment (risks to the public and birds).
	Human disturbance (6.1.3)	<ul style="list-style-type: none"> • Unpublished information suggests that this may be effective in clearing breeding colonies from urban areas if appropriate access to nesting areas can be achieved. 	<ul style="list-style-type: none"> • Likely to require intensive work during the breeding season (starting early in the season); • Suggested as being less prone to habituation than other scaring techniques. 	<ul style="list-style-type: none"> • Issues of access to all suitable nest sites; • Currently no studies to assess the extent to which any effect in a given year will persist in subsequent breeding season(s); • Some persistent individuals/pairs of gulls may require additional methods of removal.
Manipulation of nesting areas (6.2)	Preventing access, landing or nesting (6.2.1)	<ul style="list-style-type: none"> • Can eliminate nesting and loafing birds from specific proofed buildings; • Need to proof all suitable gull nest sites to reduce effectively numbers nesting in any particular area; • Correct design and placement of any devices used is essential. 	<ul style="list-style-type: none"> • Birds are likely to move to alternative suitable nesting sites nearby. 	<ul style="list-style-type: none"> • Issues of access to all suitable nest sites; • Correct design and placement of devices required for different buildings and gull species (training issues); • Periodic maintenance of devices required. • Need to minimise risks of entanglement to gulls and non-target species.
	Manipulation of nesting substrates (6.2.2)	<ul style="list-style-type: none"> • Anecdotal reports of nesting prevented by use of roofs of particular materials or colours but no consistent reports and no rigorous testing documented. 	<input type="checkbox"/>	<input type="checkbox"/>

	Creation of alternative nesting habitat or relocation of colonies to non-conflict sites (6.2.3)	<ul style="list-style-type: none"> Likely to require: (i) creation of suitable nesting habitat (suitable substrate in a setting that renders nesting areas free from ground predators; see section 6.2.2) in a location away from human interests; (ii) pro-active attraction of the gulls to the area; and (iii) use of suitable methods (see other sections of Table and Chapter 6) to disturb gulls from current breeding locations that are perceived to be problematic; No specific studies to test whether the idea is feasible in the context of urban gull colonies. 	<ul style="list-style-type: none"> Requires knowledge of likely distances over which gulls of breeding age would be likely to move if disturbed; Requires knowledge of other likely areas for colonisation (some of which might also result in perceived conflicts with humans). 	<ul style="list-style-type: none"> Availability of suitable locations within a suitable distance of existing colonies is critical; Recurrent problems with containing the colonies in non-conflict areas?
Manipulation of food sources (6.3)	Reducing food availability <i>e.g.</i> street litter, waste, people feeding gulls (6.3)	<ul style="list-style-type: none"> Likely to require widespread coordinated effort to eliminate or reduce all food sources within an area (winter problems) and within possible foraging ranges (breeding birds). 	<ul style="list-style-type: none"> Need to know the availability of alternative food sources within the range of the gulls and predict how the individual gulls will respond with respect to the removal of the sources over which the LA has control. 	<ul style="list-style-type: none"> Lack of knowledge of gull movement patterns and behaviour in urban environments currently limits use of this potential method (see 8.1 above).
Restriction of breeding success (6.4)	Treatment (<i>e.g.</i> oiling, pricking, substitution) or removal of eggs or nests (6.4.1)	<ul style="list-style-type: none"> Likely to be effective for removal of particular 'problem pairs' or for localised problem areas; Treatment of eggs may reduce gull aggression levels due to incubation behaviour. 	<ul style="list-style-type: none"> To reduce numbers of gulls at any one colony, a high proportion of eggs must be treated or removed; Continued effort likely to be required, although reduced recruitment may reduce the level of effort needed in future years. 	<ul style="list-style-type: none"> Time consuming (multiple visits required per breeding season); Little expertise required for nest or egg removal, more care required for egg treatment; Removal of eggs or nest destruction may be faster per site visit than egg treatment but is likely to require more follow-up visits to remove replacement clutches; Issues of access to all nest sites.

Removal of adult birds (6.5)	Introduction of predators (6.4.2)	<ul style="list-style-type: none"> Not likely to be useful in urban environments in Scotland. 	<ul style="list-style-type: none"> Risks to non-target species. 	<ul style="list-style-type: none"> Inaccessibility of many nests to predators.
	Contraception (6.4.3)	<ul style="list-style-type: none"> Technology not sufficiently developed currently. 	<ul style="list-style-type: none"> Specificity of chemical or hormone contraception (potential affects on non-target species); Requirement to treat a large proportion of the gull colony over an extended time period. 	<ul style="list-style-type: none"> Technology undeveloped; Time consuming, continuous effort; Attraction of pest species to any “treated” food.
	Capture and translocation or killing (6.5)	<ul style="list-style-type: none"> May be of utility in removing particular ‘problem’ nesting pairs as a temporary measure. 	<ul style="list-style-type: none"> For translocation, distance is likely to need to be large to discourage return; Replacement by other pairs likely to occur. 	
	Narcotic bait (6.5.1)	<ul style="list-style-type: none"> Isolated nesting areas with restricted public access (e.g. industrial sites). 	<ul style="list-style-type: none"> Density dependent responses (e.g. earlier and more successful breeding) from surviving individuals may reduce effectiveness; Need to target a large proportion of the colony if the aim is to reduce overall numbers; May reduce recruitment from new birds. 	<ul style="list-style-type: none"> Nests must be accessible for placing baits and collecting carcasses; Requirements and conditions for obtaining necessary specific licence are considerable; Training and health & safety considerations.
	Shooting (6.5.2)	<ul style="list-style-type: none"> Generally likely to be inappropriate for urban environments; Isolated areas with restricted public access. 	<ul style="list-style-type: none"> Density dependent responses (e.g. earlier and more successful breeding) from surviving individuals; May reduce recruitment from new birds. 	<ul style="list-style-type: none"> Training and health & safety considerations; (Police advice and consultation required).

Finally, in this section on ‘best practice’, we note that all of the potential mitigation measures mentioned above have associated practical, financial and ethical difficulties. For these reasons, prevention must always be better than cure: any practical measures that deter gulls from nesting in urban environments in the first place should be a preferred option in areas that currently do not have problems with urban gulls. These might include consideration of specific building designs that do not favour gulls, or, where possible, planning by Local Authorities to site any essential buildings that might attract nesting gulls (such as industrial areas) away from residential areas in which the gulls might be perceived problematic.

8.3 Future research suggestions

We suggest four major areas that we feel are of highest priority in the field of urban gull problems and their successful mitigation in Scotland. The first two of these research areas are generic, and results from studies elsewhere in the future would shed light on the situation in Scotland, while the last two need to be carried out within Scotland, as follows:

- *Intensive ecological/demographic studies of urban gull colonies*
We recommend the initiation of intensive studies at a representative suite of urban sites across Scotland or the UK to investigate basic breeding biology (timing of breeding, breeding success, survival rates and patterns of recruitment and dispersal) and foraging ecology (diets, foraging ranges). Such research would probably require the marking of individual chicks and adult birds, remote telemetry work and assessment of diets by direct (e.g. regurgitates) or indirect (e.g. stable isotopes, fatty acids) means. The ideal would be to carry out complementary work at a suite of natural sites in similar geographical areas to provide comparative data and allow assessment of population mixing. We suggest that this work should focus initially on Herring Gulls and Lesser Black-backed Gulls, as these have the largest urban colonies in Scotland (Chapter 4) and are most widely reported as causing problems in urban areas (Chapter 3). A coordinated study that carried out such intensive work in a standardised manner at 4-5 colonies of each species in each habitat (urban and 'natural') across Scotland (or perhaps 7-8 sites across the UK) would provide additional benefits in terms of (i) identifying key differences in ecology and demography between species, (ii) identifying key differences in ecology and demography between those gulls breeding in urban and non-urban situations, and (iii) identifying variation in ecology and demography between sites within a given habitat type that might be related to more local factors (e.g. proximity to the coast, to landfill sites). Such a study would need to document as many such colony-specific environmental variables as possible and colonies should be selected with the most likely influencing variables in mind. Such a study would need to run for a minimum of 5 years to obtain meaningful information on adult survival rates and between-year variation in demographic parameters, and preferably longer to investigate recruitment mechanisms. The design considerations for this recommendation would be complex, and would also need to consider any current or likely future needs to carry out control measures at the colonies to be targeted.
- *Adaptive management studies to assess effectiveness of mitigation techniques*
The inclusion of urban gull colonies in long-term non-intervention studies (above) is unlikely to be an attractive option in some areas where a pressing need is felt to carry out some form of mitigation action. We recommend that when such action is to be taken, wherever possible this should be carried out as part of a carefully designed study to assess rigorously the effects of the mitigation measures. Such studies need to follow a number of key principles: (i) baseline counts using an appropriate counting technique prior to the onset of the control work and counts using the same method subsequently (for as many years as is appropriate and at an appropriate spatial scale to monitor the likely effects on numbers of breeding pairs, recruits, dispersal of the birds away from the colony and so on), (ii) the implementation of one control method only at a time (so that any observed effects are not confounded and impossible to interpret rigorously), (iii) careful documentation of the details of the control measure and the urban environment in which it is undertaken (including any environmental changes that take place concurrent with, but not related to, the treatment carried out specifically for gull control), (iv) standardisation in terms of treatment and monitoring with other sites testing the same

technique if at all possible (to investigate potential variation in outcomes in relation to site-specific factors), (v) comparable monitoring at reference site(s) for a concurrent period of years if at all possible. The implementation of the intensive studies of the ecology and demography of urban gulls at sites across Scotland (as recommended above) would ensure a suite of representative reference sites for the two key urban gull species with which the findings of local studies of the effectiveness of specific mitigation techniques could be compared. See Walters & Holling (1990) for further background to adaptive management approaches.

- *Perception of urban gulls as a problem in Scotland*

The current study was given the remit of focussing on the perceptions of Local Authorities in Scotland regarding gulls in urban areas. Hence our questionnaire survey (Section 2.3 and Chapter 3) was designed to assess specifically the views of Local Authority representatives in Environmental Health Departments or their equivalents, and not the wider public. Our results can be used to conclude that many Scottish Local Authorities do perceive urban gulls as a significant problem but this perception is based only on LA perceptions and complaints from those people who have experienced urban gull problems at first hand. Our results do not show the extent to which the urban Scottish population as a whole perceives urban gulls as a problem or give any scientific proof that a wide-scale problem exists. If there is any intention to extrapolate the results of our survey to a wider context, we recommend that a wider-scale survey must be undertaken to assess the opinions on urban gulls of those members of the public living and working in urban areas. Such a survey, if designed correctly, could be used to assess in a more rigorous manner whether the problems associated with urban gulls are truly frequent in occurrence, or whether they actually occur infrequently but attract greater prominence because of their severity or interest from the media. In some situations, this type of study could form a sounder basis for implementing mitigation measures in a climate of public opposition to some forms of mitigation and control. A more detailed appraisal of the databases on complaints held by several Local Authorities in Scotland could form useful background information to aid the design of such a survey.

- *Issues surrounding use of legislation and powers*

There is clearly a strong feeling amongst Local Authorities in Scotland that difficulties of interpretation, or omission of certain powers available under existing legislation, limit their ability to mitigate against some problems caused by urban gulls (Section 3.6), and through discussions (largely with Local Authority representatives), we have identified a number of key areas that it would be useful to investigate in more detail (Chapter 7). We sought further advice on some of these issues during the course of the current study but more specific expertise in this field is required to take the discussions further. Therefore, if the Scottish Executive feels that there is a need to provide guidance on the legislation surrounding urban gull problems additional to the level that they provide currently, we recommend that further advice be sought from legal experts. Key areas highlighted by some Local Authorities that they would like to see investigated further include: the working definition of “public health and safety” in the context of its use to justify actions under General Licences; legislation that can be used to restrict persistent feeders of large numbers of gulls; use of building regulations to enforce gull-proof designs for new buildings; legislation that might allow enforcement of nest removal or gull-proofing on private buildings or access rights to allow Local Authorities to carry out the work..

References

- Baines, D. & Andrew, M. (2003) Marking of deer fences to reduce frequency of collisions by woodland grouse. *Biological Conservation* 110: 16-176.
- Baker, R.R. (1980) The significance of the Lesser Black-backed Gull to models of bird migration. *Bird Study* 27: 41-50.
- Barlow, N.D. (2000) The ecological challenge of immunocontraception: editor's introduction. *Journal of Applied Ecology* 37: 897-902.
- Baxter, A. (2004) *The Effectiveness of Bird Control at Landfill Sites*. Final Report from ENTRUST Study No. 296116.031. Unpublished report to ENTRUST
- Belant, J.L. (1997) Gulls in urban environments: landscape-level management to reduce conflict. *Landscape and Urban Planning* 38: 245-258.
- Belant, J.L., Seamons, T.W., Gabrey, S.W. & Ickes, S.K. (1983) The importance of landfills to nesting Herring Gulls. *The Condor* 95: 817-830.
- Belant, J.L., Ickes, S.K. & Seamans, T.W. (1998) Importance of landfills to urban-nesting herring and ring-billed gulls. *Landscape and urban Planning* 43: 11-19.
- Benton, C., Khan, F., Monaghan, P., Richards, W.N. & Sheddon, C.B. (1983) Contamination of a major water supply by gulls (*Larus* spp.): a study of the problem and remedial action taken. *Water Resources* 17: 789-798.
- Bergman, G. (1982) Population dynamics, colony formation and competition in *Larus argentatus*, *fuscus*, and *marinus* in the archipelago of Finland. *Annales Zoologici Fennici* 19: 143-163.
- Blokpoel, H. & Hamilton, R.M.G. (1989) Effects of applying white mineral oil to chicken and gull eggs. *Wildlife Society Bulletin* 17: 435-441
- Blokpoel, H. & Tessier, G.D. (1983) Monofilament lines exclude Ring-billed gulls from traditional nesting areas. *Proceedings of the 9th Bird Control Seminar*: 15-20.
- Blokpoel, H. & Tessier, G.D. (1984) Overhead wires and monofilament lines exclude ring-billed gulls from public places. *Wildlife Society Bulletin* 12: 55-58.
- Blokpoel, H., Tessier, G.D. & Andress, R.A. (1997) Successful restoration of Ice Island common tern colony requires on-going control of ring-billed gulls. *Colonial Waterbirds* 20: 98-101.
- Bomford, M. & O'Brien, P.H. (1990) Sonic deterrents in animal damage control: a review of device tests and effectiveness. *Wildlife Society Bulletin* 18: 411-422.
- Bowes, C., Lack, P.C. & Fletcher, M.R. (1984) Wintering gulls in Britain, January 1983. *Bird Study* 31: 161-170.

- Brousseau, P., Lefebvre, J. & Giroux, J.-F. (1996) Diet of Ring-billed Gull chicks in urban and non-urban colonies in Quebec. *Colonial Waterbirds* 19: 22-30.
- Brown, K.M., Erwin, R.M., Richmond, M.E., Buckley, P.A., Tanacredi, J.T. & Avrin, D. (2001) Managing birds and controlling aircraft in the Kennedy Airport – Jamaica Bay Wildlife refuge complex: The need for hard data and soft options. *Environmental Management* 28: 207-224.
- Burton, N.H.K., Musgrove, A.J., Rehfisch, M.M., Sutcliffe, A. & Waters, R. (2003) Numbers of wintering gulls in the United Kingdom, Channel Islands and Isle of Man: a review of the 1993 and previous Winter Gull Roost Surveys. *British Birds* 96: 376-401.
- Burton, N.H.K., Banks, A.N., Calladine, J.R., Austin, G.E., Armitage, M.J.S. & Holloway, S.J. (2004) *Indexing winter gull populations in England, Wales, Scotland and Northern Ireland: an analysis of data from the 1953 to 2004 Winter Gull Roost Surveys*. BTO Research Report No. 380, BTO, Thetford.
- Cadiou, B. (1999) Attendance of breeders and propectors reflects the quality of colonies in the Kittiwake *Rissa tridactyla* *Ibis* 141: 321-326.
- Calladine, J. (1997) a comparison of Herring Gull *Larus argentatus* and Lesser Black-backed gull *Larus fuscus* nest sites: their characteristics and relationships with breeding success. *Bird Study* 44: 318-326.
- Calladine, J. (2002) Herring Gull. In Wernham, C.V., Toms, M.P., Marchant, J.H., Clark, J.A., Siriwardena, G.M. & Baillie, S.R. (eds) *The Migration Atlas: movements of the birds of Britain and Ireland*. T. & A.D. Poyser, London. Pp 369-372.
- Calladine, J. (2004) Lesser Black-backed Gull. In Mitchell, P.I., Netwon, S.F., Ratcliffe, N. & Dunn, T.E. (eds) *Seabird Populations of Britain and Ireland*. T. & A.D. Poyser, London. Pp 226-241.
- Calladine, J. & Harris, M.P. (1997) Intermittent breeding in the Herring Gull *Larus argentatus* and the Lesser Black-backed Gull *Larus fuscus*. *Ibis* 139: 259-263.
- Calladine, J. & Wernham, C. (1996) *A review of the interactions of breeding Herring Gulls Larus argentatus and Lesser Black-backed Gull Larus fuscus with other nature conservation interests and relevant management options*. Scottish Natural Heritage unpublished report.
- Camphuysen, C.J. (1995) Herring Gull *Larus argentatus* and Lesser Black-backed Gull *L. fuscus* feeding at fishing vessels in the breeding season: competitive scavenging versus efficient flying. *Ardea* 83: 365-380.
- Casey, S., Moore, N., Ryan, L., Merne, O.J., Coveney, J.A. & del-Nevo, A. (1995) The Roseate Tern conservation project on Rockabill, Co. Dublin: A six year review 1989-1994. *Irish Birds* 5: 251-264.
- Chabrzyk, K.G. & Coulson, J.C. (1976) Survival and recruitment in the Herring Gull *Larus argentatus* *Journal of Animal Ecology* 51: 187-203.

- Christens, E. & Blokpoel, H. (1991) Operational spraying of white mineral oil to prevent hatching of gull eggs. *Wildlife Society Bulletin* 19: 423-430.
- Corkhill, P. (1970) Effect of egg puncturing on limiting chick production in Herring Gulls. *Bird Study* 17: 340-342.
- Coulson, J.C. (1986) Kittiwake. In Lack, P. (ed.) *The Atlas of wintering birds in Britain and Ireland*. T. & A.D. Poyser, Calton. Pp 248-249.
- Coulson, J.C. (1991) The population dynamics of culling Herring Gulls *Larus argentatus* and Lesser Black-backed Gulls *Larus fuscus*. In Perrins, C.M., Lebreton, J.-D. & Hirons, G.J.M. (eds) *Bird Population Studies*. Oxford University Press, Oxford.
- Coulson, J.C. (2002) Black-legged Kittiwake. In Wernham, C.V., Toms, M.P., Marchant, J.H., Clark, J.A., Siriwardena, G.M. & Baillie, S.R. (eds) *The Migration Atlas: movements of the birds of Britain and Ireland*. T. & A.D. Poyser, London. Pp 377-380.
- Coulson J C, Barrett T & Johnson, M. (1991) Tarnbrook Gullery Report 1991. (Unpublished report)
- Coulson, J.C., Butterfield, J., Kearsey, S.V., Monaghan, P., McCoy, J.H. & Spain, G.E. (1983a) The Herring Gull *Larus argentatus* as a carrier of *Salmonella*. *Journal of Hygiene* 91: 429-436.
- Coulson, J.C., Butterfield, J. & Thomas, C.S. (1983b) The Herring Gull *Larus argentatus* as a likely transmitting agent of *Salmonella Montevideo* to sheep and cattle. *Journal of Hygiene* 91: 437-443.
- Coulson, J.C., Duncan, N. & Thomas, C. (1982) Changes in the breeding biology of the Herring Gull (*Larus argentatus*) induced by reduction in the size and density of the colony. *Journal of Animal Ecology* 51: 739-756.
- Coulson, J.C. & Butterfield, J. (1986) Studies on a colony of colour-ringed Herring Gulls *larus argentatus* I: Adult survival rates. *Bird Study* 33: 51-54.
- Coulson, J.C., Butterfield, J., Duncan, N. & Thomas, C. (1987) Use of refuse tips by adult British Herring Gulls *Larus argentatus* during the week. *Journal of Applied Ecology* 24: 789-800.
- Coulson, J.C. & Coulson B.A. (1999, 2000, 2001, 2002, 2003) Unpublished reports to Dumfries and Galloway Council on breeding gulls in Dumfries.
- Coulson, J.C. & Coulson, B.A. (2003) *The food and feeding areas of Lesser Black-backed Gulls breeding in Dumfries*. Unpublished report to Dumfries and Galloway Council.
- Craik, J.C.A. Long-term effects of North American Mink *Mustela vison* on seabirds in western Scotland. *Bird Study* 44: 303-309.
- Craik, J.C.A. & Campbell, B. (2000) Bruce Campbell's islands revisited: changes in the seabirds of Loch Sunart after half a century. *Atlantic Seabirds* 2: 181-194.

- Cramp, S. (1971) Gulls nesting on buildings in Britain and Ireland. *British Birds* 64: 476-487.
- Cramp, S., Bourne, W.R.P. & Saunders, D. (1974) *The Seabirds of Britain and Ireland*. Collins, London.
- Cramp, S. & Simmons, K.E.L. eds (1983) *The Birds of the Western Palearctic*, vol 3. Oxford University Press, Oxford.
- Danchin, E., Boulinier, T. & Massot, M. (1998) Conspecific reproductive success and breeding habitat selection: implications for the study of coloniality. *Ecology* 79: 2415-2428.
- Davis, J.W.F. (1974) Herring Gull populations and man. *Nature in Wales* 14: 85-90.
- Defra (1999) *Noise & Nuisance Policy - Litter and the Law*. HMSO, London.
- Dott, H. E. M. (1994) Roof-nesting gulls in Lothian, 1994. *Lothian Bird Report 1994*.
- Douse, A. (2002) Mew Gull. In Wernham, C.V., Toms, M.P., Marchant, J.H., Clark, J.A., Siriwardena, G.M. & Baillie, S.R. (eds) *The Migration Atlas: movements of the birds of Britain and Ireland*. T. & A.D. Poyser, London. Pp 361-364.
- Duncan, N (1978) The effects of culling Herring Gulls (*Larus argentatus*) on recruitment and population dynamics. *Journal of Applied Ecology* 15: 697-713.
- Dunn, T.E. (2004) Black-headed Gull. In Mitchell, P.I, Newton, S.F., Ratcliffe, N. & Dunn, T.E. (eds) *Seabird Populations of Britain and Ireland*. T. & A.D. Poyser, London. Pp 198-213.
- Ferns, P.N. & Mudge, G.P. (1981) Accuracy of nest counts in a mixed colony of Herring and Lesser Black-backed Gulls. *Bird Study* 28: 244-246.
- Flegg, J.J.M. (1986) Black-headed Gull. In Lack, P. (ed.) *The Atlas of wintering birds in Britain and Ireland*. T. & A.D. Poyser, Calton. Pp 232-233.
- Fletcher, M. (2002) Black-headed Gull. In Wernham, C.V., Toms, M.P., Marchant, J.H., Clark, J.A., Siriwardena, G.M. & Baillie, S.R. (eds) *The Migration Atlas: movements of the birds of Britain and Ireland*. T. & A.D. Poyser, London. Pp 356-360.
- Furness, R.W. & Monaghan, P. (1987) *Seabird Ecology*. Blackie, Glasgow.
- Garthe, S. (1997) Influence of hydrography, fishing activity, and colony location on summer seabird distribution in the south-eastern North Sea. *ICES Journal of Marine Science* 54: 566-577.
- Gibbins, C. (1991) Herring Gulls in Sunderland: The status and control of a pest species. *Birds in Durham 1990*: Pp 75-82.
- Gosler, A.G., Kenward, R.E. & Horton, N. (1995) The effect of gull roost deterrence on roost occupancy, daily gull movements and wintering wildfowl. *Bird Study* 42: 144-157.
- Gregory, R.D., Wilkinson, N.I., Noble, D.G., Robinson, J.A., Brown, A.F., Hughes, J., Procter, D., Gibbons, D.W. & Galbraith, C.A. (2002) The population status of birds in the United

- Kingdom, Channel Islands and Isle of Man: an analysis of conservation concern 2002-2007. *British Birds* 95: 410-448.
- Hakkinen, I. & Numelin, J. (1980) control of Herring Gulls *Larus argentatus* by the use of gull traps at the refuse tip, Turku city, south-west Finland. *Viltrapport* 10: 123-128.
- Harris, M.P. (1964) Aspects of the breeding biology of the gulls *Larus argentatus*, *L. fuscus* and *L. marinus*. *Ibis* 106: 432-456.
- Heubeck, M. (2004) Black-legged Kittiwake. In Mitchell, P.I, Netwon, S.F., Ratcliffe, N. & Dunn, T.E. (eds) *Seabird Populations of Britain and Ireland*. T. & A.D. Poyser, London. Pp 277-290.
- Hickling, R.A.O. (1986a) Lesser Black-backed Gull. In Lack, P. (ed.) *The Atlas of wintering birds in Britain and Ireland*. T. & A.D. Poyser, Calton. Pp 238-239.
- Hickling, R.A.O. (1986b) Herring Gull. In Lack, P. (ed.) *The Atlas of wintering birds in Britain and Ireland*. T. & A.D. Poyser, Calton. Pp 240-241.
- Hoinville, G. & Jowell, R. (1978) *Survey research practice*. Heinemann, London.
- Holling, M. (1991) Roof nesting gulls in Lothian. *Lothian Bird Report 1990*: Pp 99-100.
- Hosey, G.R. & Goodridge, F. (1980) Establishment of territories in two species of gull on Walney Island, Cumbria. *Bird Study* 27: 73-80.
- Janss, G.F.E. & Ferrer, M. (1998) Rate of bird collision with power lines: Effects of conductor-marking and static wire-marking. *Journal of Field Ornithology* 69: 8-17.
- Kadlec, J.A. (1971) Effects of introducing foxes and racoons on Herring Gull colonies. *Journal of Wildlife Management* 35: 625-636.
- Kadlec, J.A. & Drury, W.H. (1968) Structure of the New England Herring Gull population. *Ecology* 35: 625-636.
- Kihlman, J. & Larsson, L. (1974) On the importance of refuse dumps as a food source for wintering Herring Gulls *Larus argentatus* Pont. *Ornis Scandinavica* 5: 63-70.
- Lack, P. (1986) *The Atlas of wintering birds in Britain and Ireland*. T. & A.D. Poyser, Calton.
- Lebreton, J.D. (1994) Demographic models for subdivided populations: The renewal equation approach. *Theoretical Population Biology* 49: 291-313.
- Lloyd, C.S., Tasker, M.L. & Partridge, K. (1991) *The Status of Seabirds in Britain and Ireland*. T. & A.D. Poyser, Calton.
- Mackinnon, G.E. & Coulson, J.C. (1987) The temporal and geographical distribution of Continental Black-headed Gulls *Larus ridibundus* in the British Isles. *Bird Study* 34: 1-9.

- Madden, B. & Newton, S.F. (2004) Herring Gull. In Mitchell, P.I., Newton, S.F., Ratcliffe, N. & Dunn, T.E. (eds) *Seabird Populations of Britain and Ireland*. T. & A.D. Poyser, London. Pp 242-261.
- Maxson, S.J., Mortensen, S.A., Goodermote, D.L. & Lapp, C.S. (1996) Success and failure of ring-billed gull deterrents at common tern and piping plover colonies in Minnesota. *Colonial Waterbirds* 19: 242-247.
- McCleery, R.H. & Sibly, R.M. (1986) Feeding specialisation and preference in Herring Gulls. *Journal of Animal Ecology* 55: 245-259.
- Migot, P. (1992) Demographic change in French Herring Gull *Larus argentatus* populations: a modelling approach and hypotheses concerning the regulation of numbers. *Ardea* 80: 161-169.
- Mitchell, P.I. (2004) Seabird populations in Britain and Ireland: the last 30 years. Oral presentation at the 8th International Seabird Group Conference, Aberdeen, April 2004.
- Mitchell, P.I., Newton, S.F., Ratcliffe, N. & Dunn, T.E. (2004) *Seabird Populations of Britain and Ireland*. T. & A.D. Poyser, London.
- Monaghan, P. (1979) Aspects of the breeding biology of Herring Gulls *Larus argentatus* in urban colonies. *Ibis*. 121: 475-481.
- Monaghan, P. (1986) Great Black-backed Gull. In Lack, P. (ed.) *The Atlas of wintering birds in Britain and Ireland*. T. & A.D. Poyser, Calton. Pp 246-247.
- Monaghan, P. & Coulson, J.C. (1977) Status of large gulls nesting on Buildings. *Bird Study* 24: 89-104.
- Morris, R.D., Blokpoel, H. & Tessier, G.D. (1992) Management efforts for the conservation of Common Tern *Sterna hirundo* colonies in the Great Lakes: Two case histories. *Biological Conservation* 60: 7-14.
- Mudge, G.P. (1978) The gull increase as illustrated by studies in the Bristol Channel. *Ibis* 120: 115-116.
- Mudge, G.P. & Ferns, P.N. (1982) The feeding ecology of five species of gulls (Larini) in the inner Bristol Channel. *Journal of the Zoological Society, London* 197: 497-510.
- Nisbet, I.C.T & Drury, (1972) Post fledging survival in Herring Gulls relation to brood size and date of hatching. *Bird Banding* 43: 161-172.
- Noordhuis, R. & Spaans, A.L. (1992) Interspecific competition for food between Herring *Larus argentatus* and Lesser Black-backed Gulls *L. fuscus* in the Dutch Wadden Sea area. *Ardea* 80: 115-132.
- O'Connell, M.J., Coulson, J.C., Raven, S. & Joyce, S. (1997) Non-breeding and nests without eggs in the Lesser Black-backed Gull *Larus fuscus*. *Ibis* 139: 252-258.
- Okill, D. (2004) Gulls nesting in Lerwick in 2003. *Shetland Bird Report for 2004*.

- Olijnyk, C.G. & Brown, K.M. (1999) Results of a seven year effort to reduce nesting by Herring and Great Black-backed Gulls. *Waterbirds* 22: 285-289.
- Ostergaard, D.E. (1981) Use of monofilament fishing line as a gull control. *Progress in Fish Culture* 43: 134.
- Owen, M., Kirby, J. & Holmes, J. (2001) *Review of the effectiveness of gull-culling for nature conservation purposes*. English Nature Report No. 438.
- Paradis, E., Baillie, S.R., Sutherland, W.J. & Gregory, R.D. (1998) Patterns of natal and breeding dispersal in birds. *Journal of Animal Ecology* 67: 518-536.
- Pearson, T.H. (1968) The feeding biology of seabird species breeding on the Farne Islands, Northumberland. *Journal of animal Ecology* 37: 521-552)
- Perrins, C.M. & Smith, S.B. (2000) The breeding *Larus* gulls on Skomer Island National Nature Reserve, Pembrokeshire. *Atlantic Seabirds* 2: 195-210.
- Pons, J.M. (1992) Effects of changes in the availability of human refuse on breeding parameters in a Herring Gull *Larus argentatus* population in Brittany, France. *Ardea* 80: 143-150.
- Ratcliffe, N. (2004) Causes of Seabird population change. In Mitchell, P.I., Newton, S.F., Ratcliffe, N. & Dunn, T.E. (Eds) *Seabird Populations of Britain and Ireland*. T. & A.D. Poyser, London. Pp 407-437.
- Raven, S.J. & Coulson, J.C. (1997) The distribution and abundance of *Larus* gulls nesting on buildings in Britain and Ireland. *Bird Study* 44: 13-34.
- Raven, S.J. & Coulson, J.C. (2001) effects of cleaning a tidal river of sewage on gull numbers: a before-and-after study of the River Tyne, northeast England. *Bird Study* 48: 48-58.
- Reid, J. (2002) Great Black-backed Gull. In Wernham, C.V., Toms, M.P., Marchant, J.H., Clark, J.A., Siriwardena, G.M. & Baillie, S.R. (eds) *The Migration Atlas: movements of the birds of Britain and Ireland*. T. & A.D. Poyser, London. Pp 373-376.
- Reid, J.B. (2004) Great Black-backed Gull. In Mitchell, P.I., Newton, S.F., Ratcliffe, N. & Dunn, T.E. (Eds) *Seabird Populations of Britain and Ireland*. T. & A.D. Poyser, London. Pp263-276.
- Rock, P. (2002) Lesser Black-backed Gull. In Wernham, C.V., Toms, M.P., Marchant, J.H., Clark, J.A., Siriwardena, G.M. & Baillie, S.R. (eds) *The Migration Atlas: movements of the birds of Britain and Ireland*. T. & A.D. Poyser, London. Pp 365-368.
- Rock, P. (2003) Birds of a feather flock together. *Environment Health Journal* May 2003: 132-135.
- Rock, P. (2004) *A study of the effects of deterring gulls from Gloucester landfill site for a two week period in March 2004*. Unpublished report to Gloucester Gull Action Group.

- Rock, P. (In Prep) Roof nesting gulls in the Severn estuary region with comment on the situation nationally. For *British Birds*.
- Sibly, R.M. & McCleery, R.H. (1983a) The distribution between feeding sites of Herring Gulls breeding at Walney Island, UK. *Journal of Animal Ecology* 52: 51-68.
- Sibly, R.M. & McCleery, R.H. (1983b) Increase in weight of Herring Gulls while feeding. *Journal of Animal Ecology* 52: 35-50.
- Skira, I.J. & Wapstra, J.E. (1990) Control of Silver Gulls in Tasmania. *Corella* 14:124-129.
- Smith, G.C. & Carlile, N. (1993) Methods for population control within a Silver Gull colony. *Wildlife Research* 20: 219-226.
- Southern, W.E., Patton, S.R., Southern, L.K. & Hanner, L.A. (1985) Effects of nine years of fox predation on two species of breeding gulls. *Ardea* 102: 827-833.
- Sowter D J. (1999-2004) *Tarnbrook Gullery Reports*. Unpublished reports.
- Sullivan, M.A. (1985) Common Gulls successfully nesting on a roof in Aberdeen. *Scottish Birds* 13: 227.
- Tapper, S.C. (1992) *Game Heritage: An Ecological Review from Shooting and Gamekeeping Records*. The Game Conservancy, Fordingbridge.
- Tasker, M.L. (2004) Common Gull. In Mitchell, P.I, Netwon, S.F., Ratcliffe, N. & Dunn, T.E. (eds) *Seabird Populations of Britain and Ireland*. T.& A.D. Poyser, London. Pp 214-225.
- Thomas, G.J. (1972) Review of gull damage and management metghods at nature reserves. *Biological Conservation* 4: 117-127.
- Thorpe, J. (1996) Fatalities and destroyed civil aircraft due to bird strikes 1912-1995. *Proceedings of the International Bird Strike Committee* 23, London. Working Paper 1: 17-31.
- Vercruijssse, H.J.P. (1999) *Zilvermeeuwen uit de duinen van Schouwen*. Ph. D. Thesis, Tilberg.
- Vernon, J.D.R. (1986) In Lack, P. (ed.) *The Atlas of wintering birds in Britain and Ireland*. T. & A.D. Poyser, Calton. Pp 236-237.
- Vermeer, K., Morgan, K.H., Smith, G.E.J. & York, B.A. (1991) Effects of egging on the reproductive success of Glaucous-winged Gulls. *Colonial Waterbirds* 15: 14-23.
- Walsh, P.M., Halley, D.J., Harris, M.P., del Nevo, A., Sim, I.M.W. & Tasker, M.L. (1995) *Seabird monitoring handbook for Britain and Ireland*. JNCC, RSPB, CEH, the Seabird Group.
- Walters, C.J. & Holling, C.S. (1990) Large scale management experiments and learning by doing. *Ecology* 71: 2060-2068.

- Wanless, S. & Kinnear, P.K. (1988) *Isle of May gull cull review 1972 – 1987*. Unpublished Nature Conservancy Council report.
- Wanless, S. & Langslow, D.R. (1983) The effects of culling on the Abbeystead and Mallowdale gullery. *Bird Study* 30: 17-23.
- Wanless, S. & Harris, M.P. (1984) Effect of dates on counts of Herring Gulls and Lesser Black-backed Gulls. *Ornis Scandinavica* 15: 89-94.
- Wanless, S., Harris, M.P., Calladine, J. & Rothery, P. (1996) Modelling responses of Herring Gull and Lesser Black-backed Gull populations to reduction of reproductive output: implications for control measures. *Journal of Applied Ecology* 33: 1420-1432.
- World Health Organization (WHO) (1948) Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, 19-22 June, 1946; signed on 22 July 1946 by the representatives of 61 States. *Official Records of the World Health Organization no. 2*: 100. [Entered into force 7 April 1948]

Appendices

APPENDIX 1a

REVIEW OF URBAN GULLS AND THEIR MANAGEMENT IN SCOTLAND: QUESTIONNAIRE SURVEY

Please return by **20th August** to Clare Clark, BTO Scotland Secretary
(Tel: 01786 466560, Fax: 01786 466561, E-mail: clare.clark@bto.org).

Definition of urban gull: In the context of this questionnaire the term “urban gull” refers to any member of the gull family, in particular Herring, Lesser Black-backed, Great Black-backed, Common, and Black-headed gulls that are found in and around built-up areas of human habitation.

If there is insufficient space for any of the questions please continue on a separate sheet.

Personal Information

Name:

Position within the Local Authority:

Local Authority:

Could you very briefly describe your experience and/or responsibilities with gulls and/or gull management?

SECTION ONE

Are there urban gulls in your LA and/or a gull problem?

- | | | |
|-----------|--|---|
| 1a | Are there any known populations of urban gulls in the area covered by your Local Authority (LA). Please tick yes or no. | YES <input type="checkbox"/>
NO <input type="checkbox"/> |
| 1b | Is the presence of urban gulls perceived to be a problem in your LA (either by yourself, others in your LA or members of the public/ local businesses who may have complained to the LA)? Please tick yes or no. | YES <input type="checkbox"/>
NO <input type="checkbox"/> |

If the answer to both 1a and 1b is NO you have now finished the questionnaire. Thank you.

If the answer to either 1a or 1b is YES, please continue.

SECTION 2

Size, distribution and trends in urban gull populations

If you hold, or have access to, information on numbers of nesting gulls and numbers of roosting/wintering gulls, and/or for various species, please differentiate this in the answers to the questions 2 to 4.

- 2** If the answer to 1a is YES, please tick the species listed below for which there are known populations:

Herring gull.....	[]
Lesser Black-backed gull.....	[]
Great Black-backed gull.....	[]
Black-headed gull.....	[]
Common gull.....	[]
Unknown.....	[]

Other (please specify)

- 3** Does your LA regularly monitor gull populations?
Please tick yes or no.

YES ☐

NO ☐

If you know of a third party that monitors gulls in your LA please specify in box:

- 4a** What is the most recent estimate of urban gull population size for LA? If there is no estimate please enter "no estimate made" and go to question 5.

- 4b** Is the estimate for all urban areas within your LA or a few specific wards (please list e.g. Torry, Aberdeen)?

- 4c** Number of count units (e.g. individual birds, pairs, nests, territories, other - please specify)

4d What year was this estimate made?

4e What time of year (month if known) was this estimate made (e.g. winter/summer)?

4f How was this estimate made (please describe e.g. full count/sample count; from ground level/on roof tops/aerial survey)?

4g Who made the estimate (e.g. self, other LA workers, external consultant (please specify)?

4h Do you hold any published or unpublished reports detailing urban gull counts in your LA area? Please tick yes or no. YES ☐ NO ☐

5a Has there been an increase in gull numbers in your LA in the last 10 years? Please tick yes or no. YES ☐ NO ☐

5b Is your answer to 5a based upon (tick all that apply):

- | | | |
|--|---|---|
| i) Previous information on population size..... | [|] |
| ii) Complaints from the public/local businesses..... | [|] |
| iii) Reports from workers in your LA..... | [|] |
| iv) Your general perception..... | [|] |
| v) Other (please specify)..... | [|] |

SECTION 3

Problems with urban gulls

6a If the presence of urban gulls is perceived to be a problem in your LA, please could you list the main problem wards (e.g. Loreburn, Dumfries) in box below.

- 6b** Is your answer to 6a based on (tick all that apply):
- i) Complaints from the public/ local businesses.....[]
 - ii) Reports from workers in your LA.....[]
 - iii) Your general perception.....[]
 - iv) Other (please specify).....[]

- 7** Do you have an estimate of expenditure within your LA on problems associated with urban gulls ? Please tick yes or no. YES ☐ NO ☐

If the answer is yes, please provide estimate and specify main costs (e.g. street cleaning related to fouling, staff time, monitoring of gull populations, methods to reduce problems/gull populations).

- 8a** Please show for each of the potential problems below, the severity of the problem. Because it is possible that some problems may be severe but you received few complaints about it (e.g. inability to sleep due to noise, airstrikes), we have split this question of severity into two columns:

Number of complaints/incidents (1 indicates no complaints/incidents, and 5 indicates many complaints/incidents).

Nature of complaints (1 indicates only minor problems, 5 indicates the problems are severe).

If you have received no complaints and know of no incidents for a potential problem, then enter zero in the corresponding box in the second column (nature of complaint).

	No. of complaints/ incidents	Nature of complaint
Noise.....	[]	[]
Fouling (droppings).....	[]	[]
Littering (other than at landfill sites).....	[]	[]
Damage to property.....	[]	[]
Aggressive behaviour.....	[]	[]
Bird strikes with aeroplanes.....	[]	[]
Disease transmission.....	[]	[]
Impacts on other wildlife species.....	[]	[]
Other (please specify).....	[]	[]

- 8b** Are the problems described in 8a seasonal in nature (i.e. do they relate mainly to nesting gulls (summer) or are roosting/wintering gulls also involved)?

- 8c** Do you think these problems have changed in the last 10 years? Please tick answer that applies.
- INCREASED ☐
DECREASED ☐
NO CHANGE ☐

If you ticked NO CHANGE, please go to question 10, otherwise go to 8d.

- 8d** Is your answer to 8c based on (tick all that apply):
- i) A change in numbers of complaints from the public/ local businesses.. [☐]
ii) Reports from workers in your LA..... [☐]
iii) Your general perception..... [☐]

iv) Other (please specify)

- 9** Has your LA determined the cause of the change in urban gulls (e.g. change in street litter, habits of people feeding gulls)? If the reason is unknown please state this.

- 10a** Is there a system within your LA for monitoring and collating data on any associated problems with urban gulls (e.g. records of complaints from public/ local businesses)? Please tick yes or no.
- YES ☐
NO ☐

If yes, please briefly describe the system in box below.

- 10b** Is your LA working with any external contractors (gull experts/ consultancies) over urban gull issues? Alternatively, do you know of any independent work within your LA on this matter? Please tick yes or no.
- YES ☐
NO ☐

If yes, please could you provide a brief description and contact details so we can involve them in the consultation exercise.

SECTION 4

Techniques used to reduce urban gull problems (mitigation techniques)

- 11** The list below shows a range of different techniques that have been used to try and reduce problems caused by urban gulls. Please show, **for each one**, whether you are:

1. Currently using this method (Used currently)
2. Have used it in the past but don't use it any more (Tried - rejected)
3. Have heard of it but never used it (Never used)
4. Have never heard of it (Never heard)

Please ensure one box is ticked for each method.

	Used currently	Tried - rejected	Never used	Never heard
Lethal control of adults/chicks:				
Shooting..... [..... [..... [..... [..... [
Poisoning..... [..... [..... [..... [..... [
Trapping..... [..... [..... [..... [..... [
Egg destruction:				
Nest and egg removal..... [..... [..... [..... [..... [
Egg oiling..... [..... [..... [..... [..... [
Egg substitution..... [..... [..... [..... [..... [
Egg pricking..... [..... [..... [..... [..... [
Prevention techniques:				
Proofing of nesting sites..... [..... [..... [..... [..... [
Alarm/distress calls..... [..... [..... [..... [..... [
Hawking (live birds of prey). [..... [..... [..... [..... [
Plastic/stuffed birds..... [..... [..... [..... [..... [
Springs and wires..... [..... [..... [..... [..... [
Mechanical scarers..... [..... [..... [..... [..... [
Other (please specify)..... [..... [..... [..... [..... [

- 12** Of any methods currently used, please list those that are considered effective?

- 13** What evidence do you use for assessing effectiveness of mitigation techniques (tick all that apply):

- i) Reduction in the number of gulls counted after mitigation..... []
- ii) Reduction in complaints made by the public/local businesses..... []
- iii) Your general perception..... []
- iv) Other (please specify)..... []

- 14** What factors influence your choice of mitigation techniques? Please show for each of the following, how important it is, where 1 indicates that it is not important, and 5 that it is very important.

i) Effectiveness..... []
ii) Cost..... []
iii) Ease of application..... []
iv) Licensing requirements..... []
v) Other (please specify)..... []

- 15** Can you see any way in which the legislation could be changed/improved that might help reduce any problems associated with urban gulls? Please specify briefly below.

- 16** Have any bye laws been introduced in your LA in relation to problems with urban gull. Please tick yes or no. YES ☐
NO ☐

If yes, please specify briefly below. It would be useful if you could supply any relevant documentation on this with your completed questionnaire.

- 17** Does the current waste strategy in your LA contain any measures to try and reduce any problems associated with urban gulls? Please specify e.g. gull proof litter bins, wheelie bins, netting at landfill sites.

- 18** If you would like to make any further comments about any of the questions within the questionnaire or issues not raised here that you feel are important, please use the box below or feel free to continue on a separate sheet.

Meeting at Stirling University

As part of the contract we will be holding an open meeting to disseminate to interested parties some of the key information collated in the project and give the opportunity for feedback and consensus prior to finalising the reporting. A provisional date for this meeting is **Wednesday 26th January 2005**.

Would you be interested in attending this meeting?
Please tick yes or no.

YES ☐
NO ☐

Would you be able to attend on the provisional date given?
Please tick yes or no.

YES ☐
NO ☐

If the provisional date is not suitable please specify a day within the week beginning 24th January that you would be able to attend:

Thank you very much for your time. Feedback from this questionnaire will be provided at the meeting in January and will be available in the Scottish Executive report.

APPENDIX 1b

QUESTIONNAIRE SURVEY COVERING LETTER

BTO Scotland & Centre for Conservation Science
School of Biological and Environmental Sciences
University of Stirling, Stirling FK9 4LA
Tel: 01786 466560, Fax: 01786 466561 (BTO, Scotland)
Tel: 01786 467799, Fax: 01786 467840 (CCS)
Email: chris.wernham@bto.org / k.j.park@stir.ac.uk



«Name»
«Add1»
«Add2»
«Add3»
«Add4»
«Add5»
«Add6»
«Postcode»

12 July 2004

Dear «Salutation»

Review of urban gulls and their management in Scotland Project - contracted to BTO Scotland by the Scottish Executive Rural Affairs Department

As you may already be aware, from the recent press release, BTO Scotland and the Centre for Conservation Science (CCS) have been contracted by the Scottish Executive to conduct a review of urban gull ecology and their management in Scotland. It is expected that the results of the review will lead to the publication of best practice guidance on the issue of urban gulls for Local Authorities and other pest control managers.

The requirements of the commissioned work are to:

- Produce a comprehensive review of the ecology of urban gulls, why they are attracted to built-up areas around Scotland and the relevant key issues and research areas;
- Identify locations throughout Scotland where urban gulls are, or are not, perceived as a problem;
- Review current Legislation and powers, how they are used currently throughout Scotland and their perceived effectiveness;
- Identify management practices in operation currently in Scotland and elsewhere, and contrast their strengths and weaknesses; and
- Propose possible solutions (uniform best practice guidance) and highlight areas where further research may be required.

As part of the initial information and opinion gathering exercise for the project, as the contractors, we are conducting a questionnaire survey of all Scottish Local Authorities. This has been developed in conjunction with several LA environmental health officers who have experience in urban gull management.

We enclose this questionnaire and would be very grateful if you could complete it and return to Clare Clark, BTO Scotland Secretary (Tele: 01786 466560, Fax: 01786 466561, E-mail: clare.clark@bto.org) no later than **20th August**.

It should take only a short amount of time to complete and your information and experience will be invaluable to the project. To allow us to assess accurately the scale of urban gull populations and associated problems in Scotland, it is important that you reply even if this issue is not perceived as important to your Local Authority.

At this time we would also like to inform you that as part of the contract, we will be holding an open meeting at Stirling University early next year to disseminate some of the key information collated in the project and give the opportunity for feedback prior to finalising the reporting. We would like to invite you, or an alternative representative from your Local Authority with an interest in urban gulls, to attend and further information is provided accordingly on the questionnaire.

If you have any questions about either the questionnaire or the open meeting please contact:

Kirsty Park
Centre for Conservation Science
School of Biological and Environmental Sciences
University of Stirling
Stirling, FK9 4LA
Tel: 01786 467799, Fax 01786 467840
Email: k.j.park@stir.ac.uk

We very much hope that you will share your experience and views on this issue and look forward to hearing from you.

With best wishes.

Yours sincerely,

Dr Kirsty Park
Senior Research Ecologist
CCS

Dr Chris Wernham
Senior Research Ecologist
BTO Scotland

Enc

100% of this document is printed on recycled paper and is 100% recyclable.

This document is also available on the Scottish Executive website: www.scotland.gov.uk
Astron B00000 05/06

ISBN 0-7559-6075-0



9 780755 960750