



Notice of a public meeting of

Goose Management Scrutiny Review Task Group

- To:** Councillors Kramm (Chair), Gunnell, Richardson, Mr Eastham & Ms Mortimer
- Date:** Thursday, 3 March 2016
- Time:** 5.30 pm
- Venue:** The Craven Room - Ground Floor, West Offices (G048)

AGENDA

1. **Declarations of Interest**

At this point in the meeting, Members are asked to declare:

- any personal interests not included on the Register of Interests
- any prejudicial interests or
- any disclosable pecuniary interests

which they may have in respect of business on this agenda.

2. **Minutes**

(Pages 1 - 6)

To approve and sign the minutes of the meeting held on 26th January and 2nd February 2016.

3. Public Participation

At this point in the meeting members of the public who have registered to speak can do so. The deadline for registering is **5.00pm on Wednesday 2nd March 2016**. Members of the public can speak on agenda items or matters within the remit of the committee.

To register to speak please contact the Democracy Officer for the meeting, on the details at the foot of the agenda.

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4. Goose Management Scrutiny Review - Draft (Pages 7 - Final Report 116)

This report provides information in support of the ongoing Goose Management scrutiny review, and asks the Task Group to identify what further work is now required to conclude this review.

5. Urgent Business

Any other business which the Chair considers urgent under the Local Government Act 1972

For more information about any of the following please contact the Democratic Services Officer responsible for servicing this meeting:

Democracy Officer:

Laura Bootland

Tel: 01904 552062

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- Registering to speak
- Business of the meeting
- Any special arrangements
- Copies of reports and
- For receiving reports in other formats

Contact details are set out above.

This information can be provided in your own language.

我們也用您們的語言提供這個信息 (Cantonese)

এই তথ্য আপনার নিজের ভাষায় দেয়া যেতে পারে। (Bengali)

Ta informacja może być dostarczona w twoim własnym języku. (Polish)

Bu bilgiyi kendi dilinizde almanız mümkündür. (Turkish)

یہ معلومات آپ کی اپنی زبان (بولی) میں بھی مہیا کی جاسکتی ہیں۔ (Urdu)

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City of York Council

Committee Minutes

Meeting Goose Management Scrutiny Review Task Group

Date 26 January 2016

Present Councillors Kramm (Chair), Gunnell and Richardson, Ms Mortimer & Mr Eastham

1. Appointment of Chair

Resolved: That Councillor Kramm be appointed as Chair of the Task Group.

2. Declarations of Interest

At this point in the meeting, Members were asked to declare any personal, prejudicial or pecuniary interests they may have in the business on the agenda.

Councillor Richardson declared a personal interest as he is on the Foss Internal Drainage Board and as a Haxby Town Councillor.

3. Public Participation

It was reported that there had been no registrations to speak under the Council's Public Participation Scheme.

4. Goose Management Scrutiny Review Report

Members considered a report which introduced information in support of objective (i) of the review remit for the Goose Management scrutiny review, and asked the Task Group to formally agree the remit and methodology for the review.

It was clarified at the start of the meeting that the wording of the Aim would be amended as follows, to ensure that the review incorporated other gardens and parks affected:

To improve the experience of residents and visitors to public parks, gardens and open spaces by examining the geese (and other water fowl) related problems affecting Rowntree Park and the University **and other affected sites**.

Members received a presentation, the slides of which are attached to the online agenda for this meeting for information. The presentation led in depth discussions around:

- The history of goose management in York and a summary of the principle problem areas
- Estimated numbers of geese in the City and the species found in York
- Current actions, in particular egg treatments
- Other actions considered, in particular the possible use of fences, how to discourage the public from feeding the geese and scaring techniques
- Currents costs of managing Geese
- Confirmation that there has been no confirmation of any health issues in people associated with Geese

Members noted the presentation and requested that further information on any policies used locally or nationally to control the geese population.

Resolved: That the Task Group:

- (i) Formally agreed the review remit, future meetings dates and review methodology detailed in paragraphs 3&5 of the report.
- (ii) Considered the information provided in the powerpoint and requested further information on any other local or national geese management strategies.

Reason: To progress this scrutiny review in line with scrutiny procedures and protocols.

Councillor Kramm, Chair

[The meeting started at 4.00 pm and finished at 5.50 pm].

Meeting	Goose Management Scrutiny Review Task Group
Date	2 February 2016
Present	Councillors Kramm (Chair), Eastham, Mortimer (Co-opted Non-Statutory Member) and Richardson
Apologies	Councillors Gunnell

5. Declarations of Interest

At this point in the meeting, members were asked to declare any personal, prejudicial or pecuniary interests they may have in the business on the agenda. None were declared.

6. Public Participation

It was reported that there had been no registrations to speak under the Council's public participation scheme.

7. Goose Management Interim Report

Members considered a report which provided information in support of objectives (ii) & (iii) of the review remit for Goose Management scrutiny review and asked the task group to agree what if any further information is required in support of those objectives.

Objectives being considered were as follows:

- ii. To examine best practice nationally and elsewhere.
- iii. To consider technical options for dropping removal, the associated costs and external funding possibilities.

Members referred to the information contained in the agenda and the fact that Wandsworth Borough Council appeared to have had some degree of success in managing geese by using a mixture of techniques and had developed an integrated management strategy for the Borough's parks. It was noted that the information was a number of years old. Members suggested that further up to date information from Wandsworth Borough

Council would be useful to find out if they are still currently managing geese successfully and by what methods.

Members agreed that the first step for York should be to understand the scale of the problem and that it would be useful for a survey to be undertaken at the start of the geese nesting season to look at the numbers of nests. This could be carried out by a contractor subject to the necessary funding being sourced. Using the scrutiny budget was discussed but it was noted that it may not be appropriate to use it for that purpose. It was suggested that the following areas should be included in any such survey:

- The Ouse from Poppleton to Bishopthorpe
- The Foss to Strensall
- Becks – St. Nicholas incorporating private gardens to Hull Road Park
- Other waterbodies such as fisherman's ponds.

Members then looked at other methods of geese management to be used alongside egg treatment and made the following comments:

- Chemicals – Officers confirmed they would be interested in a free trial of chemicals to use on grassed areas, details of which were tabled at the meeting. The Chair agreed he would contact the chemical companies to see if they would be willing to provide the Council with a free sample. It was suggested that a test area could then be identified, possibly in Memorial Gardens, to test if the chemicals were effective.
- Audio methods – it was agreed that the super sonic audio methods would not be suitable for use in public parks but officers were interested in exploring the use of ultra sound methods. Officers agreed to look into these methods and report back to the next meeting.
- Visual methods – Officers confirmed that Merchant Adventurers Hall had trialled the use of a fake fox as a deterrent to geese but were not aware of the outcome and how effective this had been. It was agreed that the use of visual deterrents could be useful in smaller localised locations but probably not suitable for larger public spaces where they could be tampered with by the public.
- Education – It was confirmed that the University uses signage to discourage students from feeding the geese but it was agreed that more complex signs explaining the effects of feeding the geese may not be suitable for public parks. Officers advised that currently, due to budget cuts, the Council does not have any dedicated park rangers or officers available to support any education programme. It was suggested that information could be distributed to primary schools so

they could undertake their own lessons. It was also suggested that local media may also assist in promoting any educational messages.

- Machinery - Members watched a brief promotional video for a machine called Tow and Collect which can be used on grassed areas to collect manure. Officers queried whether the machine would be suitable for geese droppings and confirmed a visit by a sales agent to provide a demonstration would be useful. Disposal of collected geese droppings would also be an issue and a member agreed to contact a nursery owner who specialises in fertiliser to see if anything could be done with collected droppings.

Members noted that the next meeting of the Task Group would be a consultation event on the 9th February and that a number of groups had been invited to attend. It was agreed that the proposals discussed at this meeting would be discussed with attendees at the event to identify if any groups would be willing to support any of the activities discussed.

Resolved: That the Task Group:

- (i) Considered the information provided in support of Objectives (ii) and (iii).
- (ii) Agreed that the following information would be required:
 - Further up to date information from Wandsworth Borough Council
 - Further investigation of the various methods outlined above
 - Officers to investigate the possibility of a survey of nests
- (iii) Agreed the arrangements for the consultation meeting to be held on 9th February 2016 at 5.30pm.

Reason: To progress the scrutiny review in line with scrutiny procedures and protocols.

Councillor Kramm, Chair

[The meeting started at 5.30 pm and finished at 7.15 pm].

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Goose Management Scrutiny Review Task Group
Report of the AD Governance & ITT

3 March 2016

Goose Management Scrutiny Review – Draft Final Report

Summary

1. This report provides information in support of the ongoing Goose Management scrutiny review, and asks the Task Group to identify what further work is now required to conclude this review.

Background to Review

2. At a meeting in September 2015, the Communities & Environment Policy & Scrutiny Committee agreed to proceed with a scrutiny review of Geese Management across the city following submission of an associated scrutiny topic by Cllr Kramm.
3. A Task Group made up of Cllrs Kramm, Gunnell and Richardson was set up and tasked with identifying a suitable review remit and carrying out the review. The Task Group met for the first time in early December 2015 and the following was agreed:

Aim:

To improve the experience of residents and visitors to public parks, gardens and open spaces by examining the geese (and other water fowl) related problems affecting Rowntree Park, the University and other sites.

(NB: All references thereafter to Geese, relate to both Geese and other water fowl).

Objectives:

- i. To understand previous examinations of the geese related problems in York, lessons learnt, cost to the city, associated health risks etc.
- ii. To examine best practice nationally and elsewhere.

- iii. To consider technical options for dropping removal, the associated costs and external funding possibilities.
 - iv. Consult all interested parties on geese population management and control practices, to understand the requirements for different species and animal protection issues.
 - v. Identify appropriate solutions and options for funding.
4. Furthermore, the Task Group agreed to co-opt two members on to the Task Group, one a member of the 'Friends of Rowntree Park' group and one a representative from the University of York.
5. The Task Group also identified a number of meetings dates and the following methodology for the review:

Meetings	Tasks
Meeting 1 - Formal Tuesday 26 th January 4pm (West Offices)	Objective 1 – To consider information relating to: <ul style="list-style-type: none"> • The geese population in York • All previous related work undertaken by the Council • The associated cost to the city • Lessons learnt • Any associated health risks
Meeting 2 – Formal Tuesday 2 nd February 5.30pm (West Offices)	Objective 2 - To examine best practice nationally and elsewhere. Objective 3 - To consider technical options for dropping removal, the associated costs and external funding possibilities.
Meeting 3 – Informal Tuesday 9 th February 5.30pm (West Offices)	Objective 4 – Consultation Meeting
Meeting 4 – Informal Wednesday 17 th February 5.30pm (West Offices)	To consider findings and consultation feedback, and identify appropriate review conclusions

Meeting 5 – Formal Thursday 3 rd March 5.30pm (West Offices)	To consider draft final report.
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6. The remit and methodology above was subsequently agreed by the Community & Environment Policy & Scrutiny Committee on 20 January 2016.

Information Gathered

7. In support of objective (i), at their first formal meeting on 26 January 2016, the Task Group received introductory information on the law protecting wild geese in the UK, together with a detailed presentation on goose management from the Strategy & Contracts Operations Manager. The presentation confirmed:
- There has been an issue with geese in the city for 20 years with complaints being received annually
 - The history of goose management in York with a summary of the principle areas of the city affected
 - The species of Geese found across York (including at the University), and an estimation of their numbers
 - The effect of droppings – poor water quality damaging the ecosystem of the lakes in Rowntree Park and at the University
 - The current programme of actions (in place since 1999) e.g. the treatment of eggs, the use of signage, fines for littering with bread, the daily sweeping of paths in Rowntree Park, and the associated costs
 - The Council is currently only treating Canada Geese eggs as a licence is not required for this. Previously the Council were licensed to treat the eggs of Greylag Geese but this has lapsed and needs renewing.
 - Egg Treatment entails coating the eggs in paraffin. Treated eggs are left in the nest to allow the female to continue incubating them. If removed the females will relay.
 - Other actions considered, outlining the possible use of fences, how to discourage the public from feeding the geese and scaring techniques
8. The presentation also referenced a report on a 'Review of Management Options for Resolving Conflicts with Urban Geese' produced by FERA (Food & Environment Research Agency) in 2010 – see copy of

presentation and FERA review at Annex A. Furthermore, the University of York confirmed they were experiencing the same problems with geese as evidenced in the presentation, and outlined the measures they had tried to address those problems.

9. Objective (ii) - To examine best practice nationally and elsewhere.

At a meeting on 2 February 2016, the Task Group received an information pack containing the following best practice guides, examples of good practice, and information on arrangements within the EU – see copy attached at Annex B:

- English heritage Landscape Advice Note on Canada Geese
- Natural England Technical Information Note TIN009: The management of problems caused by Canada geese: a guide to best practice
- Rural Development Service Technical Advice Note 51: The management of problems caused by Canada geese: a guide to best practice
- The Management of Problems caused by Canada Geese - A Guide to Best Practice: Produced by Dr John Allan, (Central Science Laboratory) - funded by the Dept of Environment Transport & the Regions (DETR)
- Examples of Good Practice from South West London, the Lake District and Scotland
- Information on the Arrangements for Goose Management from countries within the EU, Scandinavia, Iceland & Greenland

10. The Task Group also considered some examples of public education literature produced and in use by Friends of Rowntree Park, together with information on chemical repellents and electronic sonic devices.

11. Objective (iii) - To consider technical options for dropping removal, the associated costs and external funding possibilities.

At the same meeting in early February 2016 the Task Group considered information on two technical options for the collection of manure and watched a DVD showing those machines in use.

Consultation Meeting

12. Invitations were issued to representatives from the following organisations to attend a consultation meeting held on 9 February 2016:

- York University
- Friends of Rowntree Park

- Friends of Chapman's Pond
- Friends of New Walk
- York Environment Forum
- York Ornithological
- Askham Bryan College
- Parish Councils with ponds/lagoons – Askham Bryan, Askham Richard, Dunnington, Haxby, Holtby & Wigginton
- York & District Amalgamation of Anglers
- York Lakeside Holidays
- Yorkshire Wildlife Trust
- Farming & Wildlife Advisory Group
- RSPCA
- Public Health
- RSPB
- British Trust for Ornithology
- Yorkshire Water
- Yorkshire Farming & Wildlife Partnership
- Canada Goose Conservation Society
- Game & Wildlife Conservation Trust

13. Those that attended the meeting received a verbal update on the review work to date, and considered examples of signage used by authorities and organisations across the country to encourage the public not to feed the wildlife. The attendees went on to outline their concerns about the impact of geese and the measures they had previously taken to try to mitigate that impact.

Analysis

14. In considering the presentation given by the Strategy & Contracts Operations Manager, the Task Group accepted that:
- Canada & Greylag Geese have adopted a residential strategy in York and do not undergo long distance migration.
 - They tend to stay on or around the same body of water throughout the year based on the availability of food, the number of nearby breeding sites, and safety from predators.
 - There has been no confirmation of any health issues in York associated with Geese. However, there is evidence to show that avian and human pathogens have been isolated from goose faeces including avian flu virus, Salmonella and E.coli¹. Geese therefore have the potential to indirectly affect people and other water birds.

¹ Information taken from FERA's 2010 report on 'A Review of Management Options for Resolving Conflicts with Urban Geese' – see Annex A.

15. The Task Group recognised that the increasing population of geese in York was being driven by successful breeding as there is ample food and no predators. They therefore agreed that the continuation of egg treatment was necessary, and were pleased to note feedback from the consultation meeting, that others were also treating eggs.
16. Having discovered that Canada Geese are long-lived birds (12-16 year life span) with the average number of eggs laid in a nest being 5 or 6 each time, the Task Group considered whether the treatment of eggs was having the desired affect. They recognised that if some eggs remained untreated a limited number of chicks would be sufficient to replenish the normal annual loss of adults.
17. With this in mind, the Task Group agreed that unless every egg laid was treated, it would be impossible to prevent the number of geese from increasing. They also agreed that whilst the Council were paying a contractor to treat eggs laid on council land, there was no guarantee that all the nests on Council land were being found. Furthermore there was no real understanding of the number of nests elsewhere on adjacent land owned by others.
18. In considering whether the rounding up of a large number of the geese for transportation to a rural area of North Yorkshire was a viable option, they learnt that Canada Geese are now formally recognised as pests and therefore if caught, must be destroyed. Also, it was confirmed that those geese would likely return to their original location where they were already confident there was a food source and suitable and safe breeding sites. The Task Group therefore questioned whether it would be possible to seek permission from other land owners to treat the eggs in nests on their land.
19. In considering whether a cull would be a way forward, the Task Group noted that in 2000 it was agreed that a cull be undertaken in York. At that time a licence to cull was required so one was subsequently obtained, but the cull was never carried out following a petition from the public. Whilst sensitive to public opinion, the Task Group noted feedback from the consultation session that suggested those present would not be against a cull if carried out as part of a measured approach to the problem.
20. The Task Group also considered other methods of geese management:

- Chemicals –The Task Group noted there were a number of products in use in other countries but none which were licensed for use in the UK. The cost of those products was also prohibitive and it was unclear what effect they would have on other wildfowl, dogs and children. It was suggested that this option should be further explored and if a licensed product was found, a sample could be obtained and tested (possibly in Memorial Gardens).
- Audio Methods – it was agreed that super sonic audio methods would not be suitable for use in public parks but the use of ultra sound methods should be explored further as a solution for specific sites, and perhaps trialled to evaluate its effectiveness.
- Visual Methods – The Task group agreed that the use of visual deterrents could be useful in smaller locations but were probably not suitable for larger public spaces where they could be tampered with by the public. It was confirmed that the Merchant Adventurers Hall had previously trialled the use of a fake fox as a deterrent. Feedback confirmed that initially the geese were wary but soon became comfortable with its presence. Their view is that it may have worked better for longer, if the fox had been repositioned regularly. However, the fox was lost in the floods. The Hall now has netting placed along the river bank which has stopped geese from walking out of the water into the grounds, which they seem to prefer rather than flying into the site. This has resulted in fewer geese using their garden.
- Education – It was confirmed that both the University and the Council uses signs to discourage feeding of the birds. As a key driver of urban population control, it was agreed that the public needed educating in regard to inappropriate feeding. The Task Group recognised that minimising or banning the feeding of geese would be highly beneficial. They considered the posters produced by the Friends of Rowntree Park and the examples of signage in use nationally (see annexes C & E), and noted the risk of causing malnutrition in birds and wing deformation caused by the feeding of bread. However, they agreed that the more complex signs explaining the effects of feeding the geese may not be suitable for public parks. Officers advised that currently, due to budget cuts, the Council does not have any dedicated park rangers or officers available to support an education programme. The Task Group questioned whether information could be distributed to primary schools so they could undertake their own lessons. It was also suggested that local media may also assist in promoting any educational messages.

- Collection of Droppings & Disposal – The Task Group watched a brief promotional video for a machine which could be used on grassed areas to collect manure. It was confirmed that the machine would be suitable for the collection of goose droppings and so it was suggested that officers arrange a demonstration. However, the Task Group acknowledged that the cost of a collection machine was not the only consideration; a machine to pull the collector would also need to be purchased as the Council did not currently own anything suitable. The cost for both machines would be approximately £10k. They recognised there would also be a staff cost associated with the work e.g. 1 Hr a day x up to 357 days a year, plus the cost of disposal. They agreed it may be possible to recycle the manure by offering it to the general public but it would need to be stored somewhere where the public could access it. The Task Group therefore questioned whether goose droppings were suitable for use as fertiliser. They agreed that a nursery specialising in fertiliser should be contacted to investigate further. Finally, they agreed that a machine of the type suggested would not be suitable for use at every site affected by geese, due to the size and/or layout of some sites e.g. Memorial Gardens.
- Fencing – The Task Group learnt that adult geese can fly for all except the moult period and they typically choose to feed close to water. Therefore separating grassed areas from water bodies with a fence may be sufficient to prevent their access under certain circumstances. For example, if there are nearby trees that would prevent them from flying in – geese need an angle greater than 13°. The Task Group noted that fencing designed to prevent breeding had been shown to work but that it was reliant on the adults realising that nesting on the fenced site would prevent their chicks from being able to escape. The Task Group agreed that the high cost of fencing the lake at Rowntree Park (approximately £60k) precluded it from being a viable option for the site. However they questioned whether appropriate fencing around Memorial Gardens might be a possibility. Officers suggested that fencing the full site would cost approximately £45K. In an effort to reduce that cost the Task Group agreed it may be possible to only fence the rear of the site adjacent to the river and car park which geese use to walk into the gardens. It was suggested that a trial could be undertaken using temporary fencing to evaluate the effectiveness of fencing part of the site.
- Alternative Planting – It was suggested that longer grass could provide an effective barrier to goose grazing as geese like to have a suitable view of the surrounding area and want their young to have

visible access to a nearby body of water. However, the Task Group acknowledged that in places like Rowntree Park, the grass would never have time to grow as the geese are constantly there feeding. Elsewhere, replanting with unpalatable alternatives may work - one consultee confirmed that he had been advised that removing grass and other food sources and planting Ivy was a good way of ridding a site of geese.

- Other Deterrents – The Task Group considered a number of other possible deterrents e.g. the use of light lasers, trained dogs, distress calls, and falconry. ‘Friends of Rowntree Park’ confirmed they had tried walking dogs in the past and the geese appeared to be frightened by them, so were considering doing it again. However the Task Group were informed that geese are intelligent birds and over time would become accustomed to most stimuli. Scaring techniques would also influence the behaviour of other species and loud or visual stimuli might also conflict with the public’s use of the parks. Also the Task Group noted the use of a metal grid system placed across a body of water had been implemented in some places to prevent geese from accessing the water. However it was agreed this would not be a suitable option for Rowntree Park, as it would be costly and unsightly.

21. The Task Group considered further information on the long term results of the London Lakes Project undertaken by Wandsworth Borough Council (see Annex B for further information on that project). They noted that a cull had been undertaken at one of the parks but that overall the results were equally good at the other parks therefore suggesting the cull may not have been required.
22. Finally, the Task Group found no evidence to suggest that any single management technique would be fully effective in controlling the problems caused by geese, and where best practice showed evidence of success; this had invariably been as a result of a suite of measures.

Conclusions

23. In considering all of the information the Task Group agreed Canada Geese were the main problem for York’s parks and open spaces. Whilst at the University the issues were mainly with Greylag Geese. There was also no evidence to suggest that other forms of wild fowl were a problem.
24. Overall, the Task Group agreed that no one measure in isolation could lead to a long term improvement in the experience of residents and

visitors to York's public parks, gardens and open spaces. They therefore agreed that a mix of population-based, site-based and impact controls together with a public education approach would be required to reduce York's goose population and manage the adverse effects of geese, which in turn would benefit other waterfowl species. They also agreed that:

- Measures to encourage Geese to use land not in use by the public would be of benefit
- Site based solutions would need to be tailored to each sites needs
- It may be possible to use ward funding for some site-based measures

25. The Task Group therefore concluded that the city needed an integrated management strategy, recognising that it may take several years before a notable reduction in goose numbers was achieved. As a result they agreed that the strategy would need to be implemented and the accumulative effect monitored over several years before it would be necessary to consider whether a cull was required.
26. As a first step, in order to fully understand the scope of the problem across York, the Task Group agreed it would be prudent to undertake a survey of York's goose population, preferably during this year's nesting season. It was agreed that the cost of carrying out a survey in York should be investigated further, so quotes for the work were sourced from the Wildlife & Wetlands Trust and the British Trust for Ornithology (*quotes to be included here*).
27. Finally, the Task Group recognised that the cost of purchasing machinery, carrying out a survey, treating eggs annually and implementing other measures over a number of years, as part of an integrated strategy, would prove more costly than carrying out a cull and continuing with the treatment of eggs (as currently done). However, they recognised that the option of a cull was unlikely to be acceptable to the public.

Council Plan 2015-19

28. This scrutiny review addresses an ongoing issue for residents in a number of wards and will aim to identify a solution for those local communities. The review therefore supports the 'a council that listens to residents' priority of the Council Plan.

Implications & Risk Management

29. All implications and risks associated with the integrated management strategy drafted by this Task Group will be detailed in the review draft final report for the consideration of the full Communities & Environment Policy & Scrutiny Committee.

Recommendations

30. The Task Group are asked to consider the following draft recommendations for the review, and agree revisions where necessary:
- i) Officers to carry out a number of trials to test the effectiveness of various measures i.e.:
 - A HSE licensed chemical (if sourced)
 - A droppings collection machine
 - Ultrasound audio
 - Temporary fencing at Memorial Gardens
 - ii) Funding be provided to carry out a survey of the city's Canada goose population to map nesting sites and movement
 - iii) An integrated management strategy to be drafted for the Executive's consideration, which takes account of the findings from the various trials and the survey
 - iv) Permission to be sought from private land owners for access to treat eggs laid on their land
31. Finally, assuming an integrated strategy is agreed, it is suggested the Task Group also recommend that the Executive:
- v) Provide the necessary funding to implement the strategy
 - vi) Monitor the strategy's effectiveness over a number of years, before deciding whether to consider the option of a cull.

Reason: To assist in the development of a suitable long term strategy for the management of geese in York and to conclude this scrutiny review in line with scrutiny procedures and protocols

Contact Details

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Chief Officer Responsible for the report:

Andrew Docherty
AD ITT & Governance

Report Approved



Date 24 Feb 2016

Wards Affected: Guildhall, Micklegate & Hull Rd



Background Papers: None

Annexes:

Annex A: Copy of Presentation provided at meeting on 26 January 2016 & copy of FERA Review

Annex B: Information pack containing best practice guides, UK examples of good practice & Information on goose management across the EU.

Goose Management Scrutiny Review Task Group – 26th January 2016



Meeting 1 agenda

- Geese population
- Current actions
- Actions considered but not pursued
- Costs
- Lessons learnt
- Health risks

Overview

- Has been an issue for over 15 years
- Problem areas
 - War Memorial Gardens (damage to plants)
 - Esplanade and Kings Staith (droppings)
 - Eye of York (droppings)
 - Tower Gardens (droppings / moult site)
 - Rowntree Park (droppings / water quality)
 - Monkbridge Gardens (feeding / droppings)

War Memorial Gardens - damage



The geese population in York

- No definitive data
- Approx 250 counted on 29th September 2015 between Rowntree Park and War Memorial Gardens
- 500 plus birds in the city
- Rough 50 / 50 split between the two main species
- The geese are comfortable within the urban environment

City Walls - Station Road



Current actions

- Essentially the same actions for the last 15 years. Approach has been
 - Egg treatment
 - Clean up
 - Inform the public not to feed them – signage
- Photo of mark II sign

Actions Considered 1

- Relocation - approval
- Cull – approval, licence, where, seasonal
- Cleaning grass areas – effectiveness, cost (staff time & disposal)
- Scaring – noise, visual (decoys, dogs, birds, lasers)
- Repellents – chemicals (approvals / safety)
- Planting – grass type, boundaries

Actions considered 2 - Fencing effectiveness, visual impact & design, where, costs

- Photo to add



Costs

- Egg treatment £800- £900 pa - 120 - 180 eggs
- Ad hoc signage
- Cleaning – Rowntree Park, Kings Staith, Esplanade
- Floral displays
- Staff time – complaints

Lessons learnt

- City wide issue with local impact
- Continuing to do what we do now will not resolve the problem one way or another
- Operational
- Political

Health risks

- Perception amongst some members of the public there are health risks. 2010 FERA study *“disease transfer to people may be over played”* p5.
- *“In terms of statistics I can confirm zero cases of suspected or confirmed illness associated with Canada geese in the North Yorkshire area that have been reported to the Health Protection Unit”*. Health Protection Agency contact 2013

Rowntree Park – plan to aid any discussion



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A Review of Management Options for Resolving Conflicts with Urban Geese.

15/02/2010

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1 Background

1.1 Population sizes

Canada Geese (*Branta canadensis*), and Greylag Geese (*Anser anser*), have established large feral breeding populations throughout England over recent decades. Canada Geese are widespread in England and have an expanding range in Wales and Scotland (Gibbons et al. 1993). They are now classified as 'abundant' with a peak population size now estimated at c.127,000 in the UK (Austin et al. 2007). The population of feral Greylag Geese is estimated at somewhere in the region of 20,000 birds (Fenland Wildfowlers Association data) and is growing at a rate of over ten percent a year (British Library data). This is hugely increased by the arrival of 'wild' Greylag Geese from Icelandic and other Arctic environments each winter. However, both species do, however, tend to remain within a given area once settled.

The main issue regarding managing populations of these species is their current success rate and the associated regular increases in annual population size. Canada Geese in the United Kingdom, for example, are descended from birds originally introduced from North America in 1665 (Allan *et al* 1995). Their numbers only began to increase rapidly, after a relocation scheme implemented by the Wildfowl Trust and Wildfowler's Association between 1953 and 1957 (Ogilvie 1978) was initiated. The population in Great Britain rocketed from around 2,000 individuals to reach over 64,000 by 1991 (Rehfishch *et al* 2002). Increases of around 8% per year have subsequently occurred. Whilst the feral Greylag population is estimated at a much lower level than Canada Geese, their population is increasing at around 10% per year. Any management activity to resolve local conflicts therefore needs to consider the underlying drivers affecting these increases. Both Greylag and Canada Geese are hereby referred to as Feral Geese for the purposes of this document.



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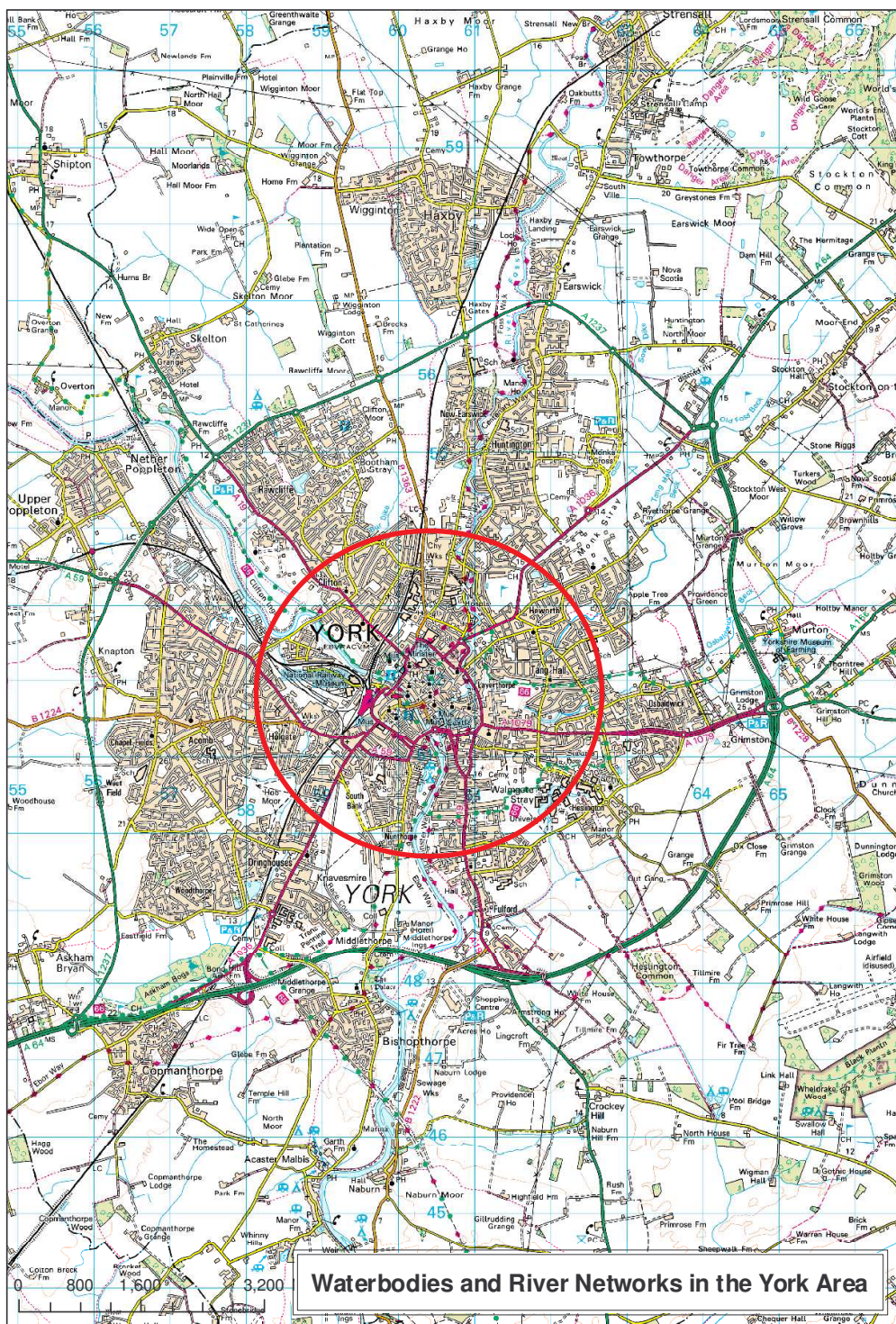
Feral Geese in Europe have adopted a residential strategy and do not undergo long distance migrations (Cooleman 2005). Many birds now stay on or around the same water body throughout the year venturing only as far as necessary to find food, safety and breeding sites. The UK is not alone; Canada Geese in the USA have adopted similar behaviours, remaining at more southerly latitudes throughout the year, possibly attracted to urban areas by the increasing amount of suitable habitat such as city parks, rivers and lakes. With ample forage available (from grass, bread provision, waterweeds etc.), safety from predators (variable size lakes, ponds and rivers etc.) and large open spaces or islands that offer security or breeding sites, the survival rates of young geese generally higher than those of 'wild' geese. The increase in populations is therefore being driven by high levels of breeding success (recruitment), rather than immigration from the wild population. Any efforts to control local populations, therefore, do require long-term pressure to ensure they are not offset by immigration from other populations in the near vicinity.

In York, central population levels of both species vary significantly during the year. A census undertaken when adults were present with Goslings (late May 2009), revealed 187 adults and 40 juvenile Canada Geese and 290 adults and 92 Juvenile Greylag geese. i.e. a summer population of 609 feral geese (+16 hybrids). Key sites at this time of year were on the Ouse and Foss and the University for Greylag geese and the same, plus Rowntree Park, for Canada Geese. Given the corridors that the rivers provide, it is not surprising that movements and linkages between sites occur throughout the area. This census did not venture outside the central region approximately demarked on the following map.



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Figure 1. Census coverage for Greylag and Canada Geese in York, May 2009.





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1.2 Concerns caused by increasing local populations

Natural and feral populations of geese across Europe and North America conflict with human and environmental interests in a wide variety of fields. Agricultural crop predation, amenity grassland damage, golf course deterioration, water pollution (Allan et al. 1995, Rusch et al. 1998) and risks to flight safety (Baxter & Robinson 2007) are all key problems caused by these species. Fouling of pasture can deter sheep and cattle from grazing, with damage levels directly correlated to the number of geese present (Spurr and Coleman 2005).

1.3 Disease transmission

Of perhaps the greatest concern is the potential for feral geese to act as vectors of avian borne disease (individuals that can carry disease within intestines or droppings for example, and transmit it to other species or locations). They may therefore be able to indirectly transmit disease to humans via land or water contamination. Water body eutrophication (where droppings result in a lack of oxygen or blooms of algae due to the extra nutrients being deposited in the water) can be a significant issue when large numbers of geese, sustained by open areas of grassland, roost on small water bodies. Although faecal matter (droppings) tends to sink to the bottom and remain within the sediment (Unckless & Makarewicz, 2007), it can lead to pollution with outbreaks of avian botulism or salmonella after periods of drought or when sediment is disturbed. Such events are not uncommon, an example being a small lake in north west London in 2008 having over 40 out of 80 geese and 15 Swans dying (Little Britain Lake, Uxbridge). Avian and human pathogens have been isolated from goose faeces including avian flu virus, Salmonella and E.coli (Allan et al.1995, Bonner 2004, Kuiken et al. 2006, Feare et al. 1999). They have the potential therefore to indirectly affect people (Bonner 2004) and other waterbirds (Blair et al. 2000).

Some studies suggest the risk of disease transfer to people may be over played. Geese are not, for example, important vectors of cryptosporidium (Kassa et al. 2004) and the risk from contact with their faeces probably varies according to season and area (Converse *et al.* 2003). Notwithstanding this, the distribution of Canada Geese is widespread, and their behaviour has enabled them to thrive in urban settings. They therefore pose a greater potential risk to human health than other waterfowl (Feare 1999). When congregations of birds remain in the same areas for long periods they can emaciate grass, nutify soils (through excessive faecal deposits), and make public areas unusable for picnics, resting or general park activities. Such situations are common in the York Park environments in areas close to waterways.



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2 Potential Management Options

Management options currently available fall into two categories:

- 1). **Behavioural modification** by scaring, use of chemical or natural repellents, physical exclusion and habitat management.
- 2). **Population management control** by preventing eggs from hatching, shooting in or out of season, culling at moult, culling with other capture techniques and/or by relocation.

2.1 Behavioural modification

2.1.1 Acoustic stimuli

The gas cannon is the most commonly used acoustic scaring device. Whilst this can be effective in some environments, it is unlikely to be suitable for urban parkland and will not be suitable for specific targeting of one species. It is well known that acoustic scarers also need to be moved regularly and be deployed for long periods if they are to remain effective. This, however, has the potential to result in habituation (where birds begin to learn that a deterrent does not constitute a threat) hence they need to be used alongside other measures to maintain their effectiveness (ADAS 1987). Urban geese, which are not hunted and are used to a wide variety of man made noises may, therefore, quickly habituate. Deterrence via acoustic reports (loud bangs) would therefore require the use of reinforcement shooting so could only reasonably be deployed to prevent feeding in crop fields away from the public environment.

Others devices available produce loud shrieks or broadcast pre-recorded distress calls, infrasound or ultrasound. Geese do not hear ultrasound, and the few infrasound trials undertaken suggest they will not respond to this (Fidgen, unpubl 2005). Many species habituate less quickly to scaring devices that incorporate their own species' distress calls. Distress calls of gulls, crows and wading birds are used extensively to deter these species from airfields. The success of the method is, however, very dependant on how it is applied. Recent research successfully reduced crop damage by Canada Geese only when calls were used 'on-demand' (Whitford 2008). This basically meant that instead of using an automated method that set off deterrence calls every 10, 20 or 30 minutes (routinely), the method was only implemented whenever birds arrived at the site. A study by Mott and Timbrook (1988) was also successful for short periods (2-3 weeks), although the birds rapidly returned once scaring had stopped. A report commissioned by the acoustic control manufacturer "Goose Buster", suggested habituation to distress and alarm activity within 5-7 days, but longer success of 3-5 weeks when birds had a choice (i.e. Moving geese to another adjacent area) (Streng & Whitford 2001). Such activities were, however, deployed against migrant, rather than feral geese. Another study failed to scare any geese (Aguilera *et al.* 1991) and the method may be least effective against established resident and/or urban populations. The responsiveness of Canada Geese to distress calls (c.f. alarm calls) has not been tested in scientific trials although an independent user (Horton, pers comm.), suggests it can be effective in a parkland environment at moving birds to the nearest alternative safe environment. As with any other acoustic deterrents, their use may be inappropriate in areas where people find the noise levels offensive (Allan *et al.* 1995).



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2.1.2 Visual stimuli

Visual scaring devices come in a variety of forms, from scarecrows, to plastic strips attached to poles, kites, balloons, imitation figurines of birds of prey, birds of prey themselves and even inflatable human figures that rise from a box in the ground carrying an imitation gun (Scareyman). Just like acoustic devices they only remain effective for as long as the birds natural neophobia (fear of the new) persists. An eventual habituation to these devices is usual and urban geese may be far less easy to scare than other more timid species (Allan *et al.* 1995).

The use of birds of prey is, as far as we are aware, untried against urban geese. Whilst this method can have excellent results and clear large areas of target birds such as gulls and corvids from landfill sites (Baxter 2005), its success is often reliant on deployment of birds that actually hunt the prey species. Flights of falcons, when flown to a lure to “simulate” a hunting bird, are unlikely to impact on feral goose populations. Habituation by gulls took around five weeks in the urban environment when intensive non-hunting falconry was implemented in Dumfries in 2009 (Baxter, in press). Large falcons e.g. Gyr x Saker hybrids, or trained Eagle species may create fear in urban geese but their deployment would need significant, research, skill and investment and may prove difficult to implement in the urban environment.

Dogs (generally trained Border Collies), are frequently being used at airbases and in public spaces in the USA (e.g. www.wildgoosechasers.com). There is little to suggest they would not be effective but the length of time needed to implement deterrence is not clear. Rowntree Park, for example, could be patrolled by a Border Collie on a daily basis, weekly basis, mornings, afternoons etc. Birds may disperse across the Ouse or further a field hence monitoring would be needed to evaluate whether dispersal was successful on a site by site basis or across a wider area. It is possible that, for example, deployment in key areas for alternate one-week periods (e.g. in April to reduce breeding use and June to prevent birds staying to moult), could be beneficial. This would need to be monitored and tested to determine the frequency and effort needed to maintain effect. It would appear that a full time programme is used in Stratford to achieve this aim (Feld 2005).

Laser bird deterrents have been in use for several decades and represent a possible option for dispersing feral geese. An evaluation of lasers to disperse American crows from a series of roost sites (Gorenzel 2002), suggested that single deterrence efforts each night were effective at dispersing birds but did not result in them staying away for the whole night. Deterrence against gulls at a UK winter roost took this methodology forward and implemented dispersal every 30 minutes throughout consecutive nights for as long as necessary. Full deterrence of the gull roost was achieved (Baxter 2007iii). Whilst not reported within this paper, a flock of around 80 feral geese were also dispersed to adjacent fields although small numbers of Mute Swans did not respond. Similarly, diving ducks and grebes responded by diving but dabbling ducks flew away. The predator response was therefore initiated by affected species. A similar trial of lasers was undertaken, against feral Canada Geese, at a small lake in London. About 120 birds were dispersed with a 90 second sweep of the site on one night, with zero birds returning to that roost after 3 nights of deterrence. This was a post-moult roost site used as a base to forage from (Baxter, pers obs). Lasers therefore have the potential to disturb and disperse birds (at night only), and may prove a useful tool within an overall integrated strategy.



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2.1.3 *Lethal control as deterrent reinforcement*

Shooting, although usually regarded as a means of population control and discussed later, can be used to reinforce most other non-lethal scaring effort. The action of shooting combines visual and acoustic stimuli and can be used to reinforce methods by the occasional killing of a bird. Increased shooting pressure appears to improve the responsiveness to other scaring methods but is unlikely to be practicable in urban areas for safety and public perception reasons. It is nevertheless highly beneficial when confirming response rates of birds to other methods.

2.1.4 *Repellents*

Few chemicals that successfully deter, rather than poison, birds have been identified. Diazinon, an organophosphorous insecticide, has been effective in preventing damage by Canada Geese to golf courses but proved fatal to other wildfowl. Such chemicals are not approved for use in the UK. Naturally occurring plant products or their derivatives may provide a solution but again have issues in terms of UK regulation. Research in America and the UK, for example, suggests that Methyl Anthranilate (MA) and Cinnanamide can be effective in preventing many birds feeding on treated foods (Cummings et al. 1991, Crocker and Reid 1993). During commercial product testing in the USA, products such as “Rejex-IT” and “Goose chase”, which have MA as their active ingredient, are reportedly effective at reducing foraging activity on grass. MA is a derivative of grape juice, is widely used in the USA, and creates a bitter taste on the grass. It is viewed as harmless in the USA but is not licenced for use in the UK as it has the potential to cause harm to the birds. MA is extremely cheap to purchase and could possibly be used under a trial licence from the HSE in this country (manufacturers details from <http://www.bird-x.com/goose-chase-p-8.html>). Cinnanamide (taken as an extract from cinnamon), has been tested in cage-trials in the UK under licence but there is unlikely to be a sufficient market for the product to warrant further development.

More recent work has investigated the affect that endophytes have on the palatability of grasses and how incorporating them in some swards improves their repellence to herbivores such as geese (Cheplick and Faeth 2009). Endophytes are bacterium or fungi that live within a host plant for at least part of their life cycle. All plants have them, and their relationship with their host appears to be symbiotic. Many important forage and amenity grasses have fungal endophytes and their presence can improve the swards resistance to stresses such as drought and grazing. Particular strains, however, have now been developed in New Zealand that have an endophyte within them which massively increases the unpalatability of grass which results in digestive malaise (stomach upset) in geese. The manufacturer is currently seeking opportunities to trial its success in grassland environments against species such as geese. The issues at the moment involve whether or not large enough quantities of grass seed can be provided to cover sensible size areas (rather than, for example, 10m x 10m sample plots).

2.1.5 *Physical exclusion and habitat modification*

Geese can be excluded from sites through the use of fencing, wires or tape. These methods can be used effectively to restrict access to ponds, ditches and even cereal fields (Rochard and Irving 1987, Summers and Hillman 1990) but will only work under certain circumstances. Adult geese, for example, can fly for all except the moult period (c. mid-June to mid-July). Any mesh fence designed to prevent breeding



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on a site is therefore reliant on the adults realising that nesting on a proofed island will result in their chicks being unable to escape. Traditional mesh designs with a gap at the bottom allow geese to exit after hatching whereupon they do not need to return to the island. Breeding control netting therefore needs to be at least 90cm high and fitted without gaps at the bottom.

Deterrence fencing has been used against other species (e.g. Lapwings) on airfields by spacing 1m rolls of orange plastic mesh fencing at 20-50m intervals across grassed areas so birds do not have a suitable view of the surrounding area (Deacon 2003). This results in the security offered by large open space security being removed and birds becoming more easily 'spooked'. The method is untried against geese but could create a useful barrier for short periods prior to, for example, events or picnic periods. It could create a relatively unsightly and unaesthetic result for the public, however.

In some cases habitat modification can be used to make places less attractive to geese. Geese typically choose to feed close to water, in places that are open and provide easy predator detection as well as flight escape routes (Conover and Kania 1991). Separating grassed areas from water bodies with a stand of trees that would need geese to have to fly out at an angle greater than 13° may be sufficient to prevent their access. Replanting areas with unpalatable swards and modifying cropping patterns so that fodder is not available close to water bodies may also help reduce damage by geese (Allan *et al.* 1995). It has been suggested that strips of longer grass can provide effective barriers to goose grazing. Strips of grass over 6" (150mm) in height around 10m or so wide surrounding waterbodies could be trialled. Our interpretation is that even if geese do not feed on this grass, they are likely to create trampleways through it, or fly over it and it is unlikely, however, to be effective.

Restricting access and habitat modification can be effective in the right circumstances, but can also affect other species, reduce public access or impact on recreational and landscape quality in public areas. Mesh fence netting to prevent breeding on islands is generally the most practicable solution presented for the majority of sites which use it.

2.1.6 Education

As a key driver of urban population control is the availability of food resources from the public, opportunities to minimise or ban the feeding of urban geese can be highly beneficial. The population of Canada Geese on a section of the river Thames that runs through central London halves in winter. The primary driver of this is a lack of publicly provisioned food and a lack of grass growth in winter.

Given that geese are known carriers of Avian Botulism, Salmonella, E.coli and Avian Flu, for example, and that there is potential risk of disease transmission via faeces present on grass (e.g. small children picnicking and retrieving dropped food), education to reduce feeding may be prudent. Similarly, the usual food source provided is bread and this is at risk of causing malnutrition to birds and a wing deformation known as "angel wing" (Manitoba, 2009).

Signage confirming geese / rats / pigeons carry diseases could be beneficial. Geese can also become aggressive when defending young. Educating the public about these problems may help to reduce the likelihood of them providing additional food.



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3 Population management control

3.1.1 Population Control and the Law

All birds are protected under the Wildlife and Countryside Act (WACA) 1981 as amended. However, exemptions are available that allow control of some species for Public Health and Public Safety and Air Safety.

Canada Geese (*Branta canadensis*) can be controlled at any time to preserve public health or public safety under a general licence; this permits the use of both egg control (via oiling or pricking) and lethal control (using permitted methods) of adults. It is expected that all non-lethal methods of deterring populations have been tried and can be shown to be ineffective. Licences are available on-line from Natural England.

Greylag Geese (*Anser anser*) are not covered under the general licence and therefore specific licences would need to be obtained to allow egg or adult control techniques to be used legally. All non-lethal methods used for controlling populations need to be listed within the licence application to confirm lethal control is a necessary measure. Licences can be obtained through Natural England. Greylag geese can, however, be shot under the WACA (1981) Schedule 1 Part 2, during an open season, which runs from 1st September until 31st January, with landowners permission.

3.1.2 Controlling reproduction

A key driver behind preventing population increases locally is to prevent internal recruitment (breeding) from occurring. This can be achieved humanely by preventing either the adults breeding (through deterrence) or their eggs hatching. Various options are available. Chemosterilants for Canada Geese are not available although surgical sterilisation of males would be effective but is extremely difficult to achieve across all individuals and incurs the expense of veterinary deployment. Nesting adults sit closely on their nests and can be easily shot at close range whilst defending their eggs. However, other, often more publicly acceptable methods include egg destruction, removal or treatment to prevent hatching.

Treatment usually entails pricking the eggs, boiling the eggs, replacing the eggs with dummies, or coating them in paraffin oil (Allan *et al.* 1995). Treated eggs are left in the nest to allow the female to continue incubating them as normal. Doing so is more effective at controlling reproduction than destroying clutches or removing them. This merely results in the females relaying (Baker *et al.* 1993).

Canada Geese are long-lived birds and have especially low mortality at urban sites (12-16 year life spans are not unusual). It may therefore take many years of concerted effort before a programme of reproductive control begins to reduce an *in situ* population size. Furthermore, if a few clutches are missed and allowed to fledge the limited recruitment can be sufficient to replenish the normal annual losses of adults. A concerted effort is therefore required to ensure 100% of eggs are oiled in at least 95% of nests. Non-feral goose populations that do not have immigration issues can be held static by collecting 72% of eggs each year (Barnard 1991). Over 50% reductions in Canada Geese populations (4000 birds at 58 sites across a 100 sq km area), have been achieved using integrated programmes of annual egg oiling at all sites and adult moult culls at upto 15 key sites (Baxter *pers. obs.*).



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3.1.3 *Shooting, culling and trapping*

Populations of wild geese in the USA have been shown to withstand heavy shooting pressure. Annual harvests of up to 40% appear to have no impact on overall numbers (Shaeffer *et al.* 1987). Similarly, in both Finland and New Zealand winter shooting alone and extensions in the shooting season, respectively, caused no reduction in the population size (Vikberg and Moilanen 1985, Imber and Williams 1968).

Furthermore, in many urban scenarios shooting may be impossible due to reasons of safety considerations and public perception.

Other methods of culling geese are possible. Large numbers can be caught during their annual moult. At this time the geese are flightless for around 3-4 weeks (Cramp and Simmons 1977) and can be rounded up or corralled into enclosures that can be set up on appropriate waterfronts. Once caught, geese can then be despatched humanely using cervical dislocation, lethal injection or shooting (note that some methods may require the presence of a veterinary officer and a specific licence even for Canada Geese). This form of cull is advantageous in so far as it causes an immediate reduction in numbers, decline in damage and removes a large proportion of adults from an area.

Fera has undertaken a number of such culls under licence in the UK with high success. Nevertheless, repeat operations over 2-5 year periods may be required if mop up breeding control is not continued in future years. Surplus non-breeding birds may also choose to moult elsewhere and can then repopulate an area the following year if not deterred. When these birds return to their natal sites (where they hatched) they typically fill in the gaps made in populations by any moult-cull.

Trapping can be used to catch small numbers of geese. This, however, often requires a period of baiting as well as acclimatisation to the traps presence and, therefore may not be discreet enough in public areas (P. Irving *pers comm.*). The use of bait treated with stupeficient may also be feasible but runs the risk of affecting non-target species and would require a trial licence to use in the UK.

3.1.4 *Relocation*

Relocation has been used very successfully in America to reduce resident Canada Geese populations. The relocated birds have been used to boost hunted populations or form new colonies (Conover 1993, Cooper 1986). However, mass relocation is an expensive operation and given the current problems here in the UK as well as the rest of Europe, many landowners are unlikely to want them and the UK government is unlikely to licence such activity. Further redistribution is also likely to encourage their geographical spread and so should be discounted as a control option (Allan *et al.* 1995).

3.1.5 *Integrated strategies*

It is rare that a single strategy can be effective at all sites, all of the time. Integrating options therefore represents the most effective way of approaching wildlife management problems. Several examples exist whereby resources have been targeted at each area where problems have been occurring in order to facilitate an overall reduction. Battersea Park in the mid 1990's (Underhill 1996), represents such a case. A suite of measures were used as part of an integrated management strategy (IMS) to reduce the attraction of the area by fencing, food reduction, education and



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lethal control. Any birds that continued to attempt to breed following the fencing operation had their eggs oiled or pricked, after which 154 out of 262 adults present were culled. Numbers fell to 63 the following year (down from the 108 remaining in 1994). The overall sub-population (including nearby areas) only declined by a total of 66 birds. This indicated either local recruitment, dispersal or immigration had occurred. Despite this, the park itself showed a significant decline in numbers and had the programme been continued or expanded across the area, may have resulted in long term or wider area declines. Independent monitoring in 2007, however, showed greater numbers were present than in 1994 (Baxter, 2007i).

A recommendation from this research was that the process should be implemented across a wider range of sites to include all birds within local sub-populations (birds that move around but remain within a given area). This has been done in west London since 2000 and has covered egg oiling at 58 sites over 100 sq km area alongside moult culls that have removed over 1500 adults at 15 key sites (Baxter 2009). This strategy has resulted in a population of 3750 birds that was expanding at 12% a year in the year 2000, being reduced to less than 2000 birds by 2008. Sites at which culls have been undertaken have declined by around 67% with some now abandoned altogether. Without additional work to remove or prevent birds being able to utilise attractive habitat, however, such activities will need to be continued year on year.

Similar strategies have been deployed by the 'Geese Peace' organisation based in the USA (Feld 2005). They include elements of scaring, limiting food access and egg control. These strategies rely on acceptable and unacceptable areas in which humans and Canada geese can co-exist. The objective is to arrange, via local contributions and training of volunteers, a reduction in Canada goose numbers from key areas by egg oiling, and a deterrence of moulting birds by regular and routine patrols from Border Collie dogs. The programme has had a level of successful deployment in Stratford upon Avon in the UK (<http://www.geesepeace.org/Stratford-upon-Avon.htm>). From discussions with the president of this organisation they also encourage artificial feeding of birds using foods that do not contain bread in order to reduce the risk of flightless birds developing (bread does not contain sufficient calcium and minerals to allow correct bone formation resulting in birds with weak, upward bending wings developing). Data from the Stratford Society suggested reductions from around 800 birds to 120 birds had been achieved by autumn following the year the programme started. It is understood from discussions that continued dog work has, to date, prevented the majority of moulting birds from returning but that the 'resident' population remains stable. Similar moult dispersal could be possible in York as geese have access to rivers and can therefore move freely between areas.

Removing the availability or attraction of an area through habitat management, dispersal of birds away from key areas and prevention of population rises provide the main drivers behind the integrated management strategies available for York.



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4 Management Options

Feral geese in York breed along the banks of the two main rivers and occasionally in local parks. Ringing returns (Bone pers comm.), show that some birds move significant distances but the majority remain faithful to York as long as they have breeding sites, feeding sites and security available throughout the year. In urban environments current best practice emphasises the use of integrated management strategies that combine techniques (Mott and Timbrook 1988, Heinrich and Craven 1990) and the use of repellents and population control to reduce damage at sensitive sites (Conover 1993). No single technique is likely to resolve the overall issue.

Habitat Management

Habitat management techniques require geese to feel insecure and unwelcome by prevention (physical exclusion) or habitat modification (removal of attractive sites). Options include:

- Identification of all breeding sites
- Installation of goose proof fencing to all breeding sites where possible
- An education programme to prevent birds being fed by the public
- A refresh of signage
- The prevention of access to grass areas via fencing or planting
- Application of MA under a trial licence
- Sowing of endophytic grass seeds if available

Reducing the security, proofing or removing breeding sites and minimising or eliminating feeding opportunities should be the primary methods used so that remaining birds can be dispersed or moved more easily.

Egg management

Egg management is one of the most effective ways of containing population growth provided coverage is high and the vast majority of nests and eggs are located (estimates of over 90% coverage needed to prevent growth). Options include:

- Continue ongoing egg oiling programme, under licence for Greylag Geese.
- Work with other landowners to include more nest sites within the treatment area.



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Deterrence or removal

Following as much habitat management and egg control as possible, deterrence or removal strategies should be targeted at the remaining key times and locations. In general, techniques that modify behaviour such as scaring can be advantageous as they are more publicly acceptable. Use of these techniques may be time limited to coincide with peak periods of conflict. However, the main problem with these techniques is habituation. Options include:

- Deterrence at night by lasers
- Deterrence during the day by trained dogs
- Testing the use of distress calls
- Testing the use of falconry

Birds will, however, become accustomed to many stimuli if they are not reinforced (e.g. shooting) or varied. Some scaring and exclusion techniques can also be unselective and influence the behaviour of other species. Loud or visual stimuli may also conflict with public access or land use requirements.

Shooting in fields known to be frequented by York birds (via monitoring from August to confirm movements), may provide a method by which reductions could be made in the problems associated with geese without culling in the urban area. Reductions in this way could be achieved by:

- Culling in urban area during moult
- Shooting in surrounding farmland during autumn (either in season or under licence).

Conclusions

A combination of techniques, tailored to individual sites represents the most appropriate way forward. This could entail education and breeding control across York, followed by deterrence from key sites that cause the most concern. Similarly a moult round-up and cull could reduce the overall issues significantly but may not prove to be an acceptable way forward.



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Goose Management Scrutiny Review

Review Objective 2 - To Examine Best Practice Nationally & Elsewhere

It is recognised that geese can and do cause major damage to amenity grasslands, pastures and crops through grazing and trampling. Droppings can be a health and safety risk to humans, both through ingestion but also causing slippery conditions. Ecological impact includes damage to other wildlife (such as trampling other bird nests) and destruction of waterside habitat, for example reed beds. The birds also pose an airplane collision risk in many parts of the world. In recognising the issues associated with geese, a number of recognised organisations/bodies have produced best practice guides.

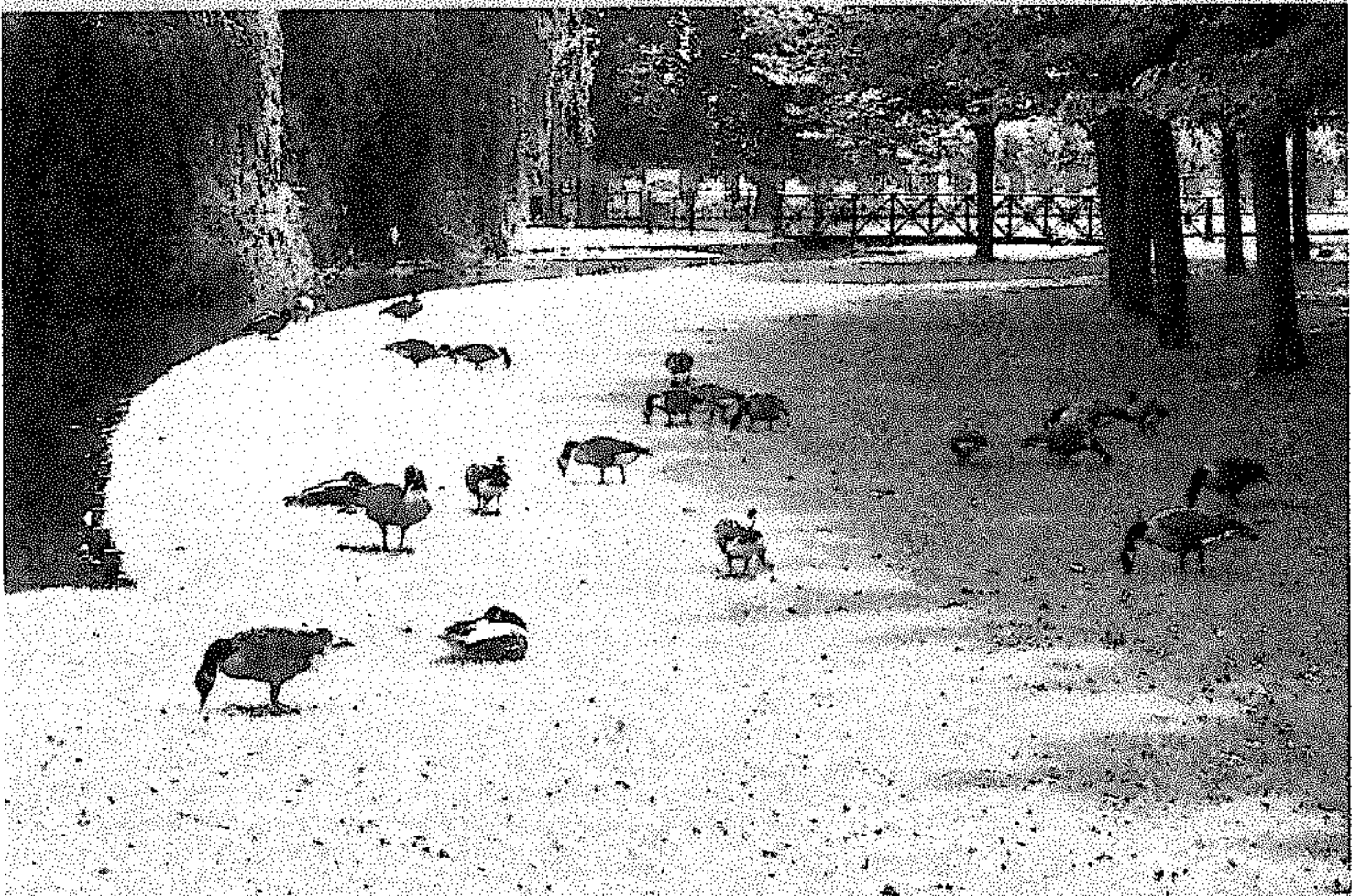
In support of review objective (ii) an information pack has been assembled containing those best practice guides, together with examples of good practice in the UK, and information on arrangements within the EU.

Information Pack

- Item 1 - English Heritage Landscape Advice Note on Canada Geese
- Item 2 - Natural England Technical Information Note TIN009: The management of problems caused by Canada geese: a guide to best practice
- Item 3 - Rural Development Service Technical Advice Note 51: The management of problems caused by Canada geese: a guide to best practice
- Item 4 - The Management of Problems caused by Canada Geese - A Guide to Best Practice: Produced by Dr John Allan, (Central Science Laboratory) - funded by the Dept of Environment Transport & the Regions (DETR)
- Item 5 - Examples of Good Practice from South West London, the Lake District and Scotland
- Item 6 - Information on the Arrangements for Goose Management from countries within the EU, Scandinavia, Iceland & Greenland



Landscape Advice Note: Canada Geese



Canada geese (*Branta canadensis*) frequently use lakes, ponds and grassland in historic landscapes, and may have adverse effects for a variety of reasons. This Landscape Advice Note outlines the damage that can be caused by Canada geese and how this can be managed and mitigated at historic sites.

INTRODUCTION

Waterfowl are an important feature of many lakes and ponds in historic landscapes. It is essential to determine the causes of problems before targetting management of individual species or groups of species. The ecology of individual species and their abundance will have different impacts.

CANADA GEESE

The Canada goose is not a native species. It was introduced from North America, initially by Charles II in 1665 and there have been many further introductions since. Until the 1940s, most geese were resident in parklands and numbers remained fairly low. There has been a rapid increase in population over the past 70 years, partly due to an increase in suitable habitat such as reservoirs and flooded gravel pits. The British population is still increasing.

Canada geese are largely herbivorous and spend a lot of time grazing on grassland or in water. Parks can be ideal habitat for the species. This can lead to problems with feeding damage or trampling of vegetation, and accumulations of droppings.

Canada geese can live up to 30 years. They start breeding at two to three years old. Females lay usually four to nine eggs in March or April, and nest either singly or in small groups. The species has very different requirements at different times of year. In the breeding season, water bodies with islands or other undisturbed areas are selected by the geese as these make secure nesting sites. Following breeding, adults moult for around 35-40 days in June and July. They are flightless and spend most of their time on the water to avoid predators. During the autumn and winter they select sites with good grazing.

Many Canada geese are extremely tame, and will come to be fed consequently they are often very popular with visitors. On some sites, control of this species may well be a contentious issue.

TYPES OF DAMAGE

Canada geese, particularly if present in large numbers, may cause a number of problems:

- Vegetation damage

Grazing geese may damage lawns and other vegetation, particularly on the banks of ponds or lakes. The birds forage on a range of vegetation. As well as grass they will also eat aquatic and emergent plants which can be important for maintaining dissolved oxygen levels in water bodies. Geese may also damage vegetation by trampling, particularly around the edges of water bodies. In large numbers, the geese can also damage grass areas.

- Droppings

On lawns and grassland Canada geese droppings are unsightly, and the droppings may make paths dangerously slippery. Droppings in lakes and ponds add nutrients, particularly nitrate and phosphate, to the water, which can eventually seriously affect the water quality ecosystem. There is some evidence that they pose a hazard to human health if accidentally ingested.

- Physical damage

Large numbers of geese may create extensive areas of bare ground at the water's edge and cause erosion of the banks.

- Aggression

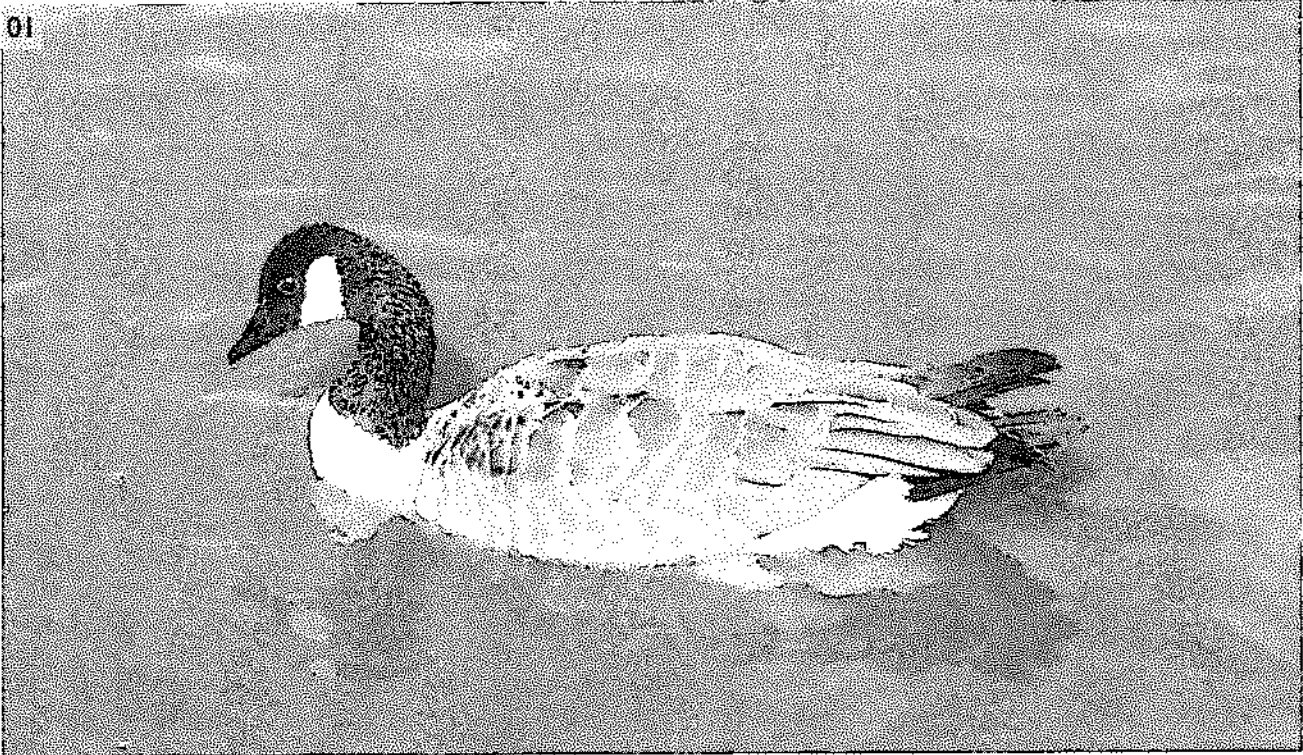
During the breeding season, geese may become more aggressive towards people, dogs and other waterfowl. Dogs may provoke a particularly fierce response from geese during the breeding season.

EXTENT OF DAMAGE

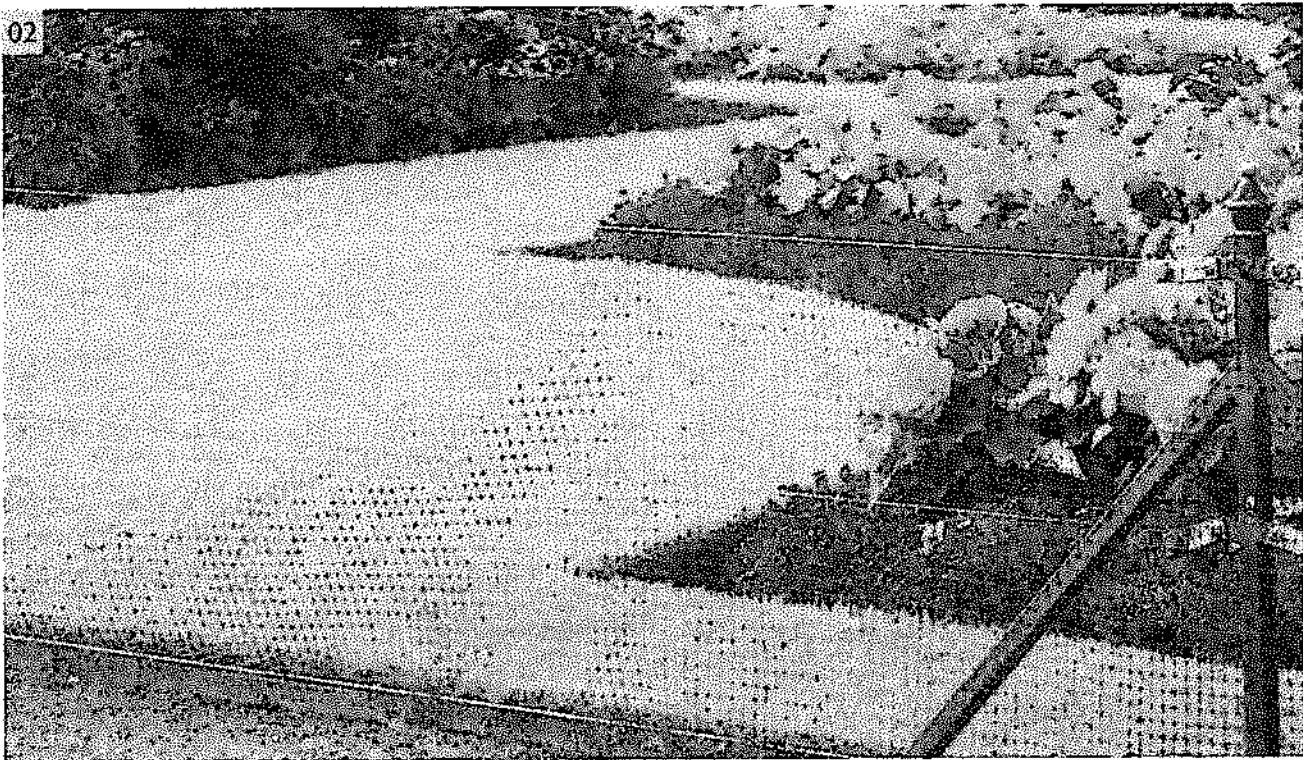
Damage caused by Canada geese must be viewed in context - the impact of any damage depends not just on the numbers of geese present but also the nature and uses of the site. A relatively small number of geese may cause significant problems in a small formal site, while a much larger population may cause no significant problems if the site is large, less formal, or little used by people.

Before any control is considered, it is important to carry out monitoring of the population to determine when in the year Canada geese use the site, and what they use it for. If geese are not present all year round, monitoring should also be carried out in other areas they use as any control measures may need to be

01



02



03 04 05 06 07

In large numbers, Canada geese can damage vegetation in and out of the water and create a large amount of mess © Alan Cathersides

08 09 10 11 12

A Canada goose on water © Alan Cathersides

13 14 15 16 17

Important vegetation may require specific protection from being eaten or trampled by Canada geese © Alan Cathersides

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coordinated with other landowners to ensure they are effective.

Although geese may be the most visible cause of a problem, they may not be the most significant. For example, water supply and the flow in a water body will have an enormous impact on the water quality.

The presence of other waterfowl species should also be monitored, as these may be affected by control measures.

MANAGEMENT OPTIONS

Research on the control of Canada geese has identified a range of techniques. The research, which included one site with over 300 geese present in summer, suggests that control techniques used in isolation are unlikely to be effective. Control measures will only work if an integrated programme of management techniques is carried out.

In many cases, management options will necessarily be restricted by the need to preserve historic features, planting layouts and so forth. Not all management options will be appropriate for all sites.

All potential control methods are aimed at reducing the numbers of geese, rather than completely excluding geese from a site, as this is usually impossible to achieve. Most control methods may be less effective if the population is relatively small. Control measures can be divided into site-based and population-based techniques.

SITE-BASED MANAGEMENT

Site-based management measures do not require a licence and include:

- Exclusion from islands

Fencing islands in ponds and lakes used for breeding can discourage geese from nesting on the islands. A 1m chicken wire fence with a 10cm gap between the ground and the bottom of the fence will allow other waterfowl to use the island. This technique is most likely to be successful if islands are well vegetated as this discourages geese from flying over the fence.

- Access to grazing areas

Fencing around the margins of a water body can discourage geese from feeding in areas beyond. In this way they can be directed away from sensitive grazing areas. Replanting grassland areas with shrubs decreases the food supply. Fencing these areas will be needed to ensure plants establish without grazing or trampling pressure.

- Reduce visibility of water bodies

Geese prefer to graze close to a water body which provides them with a safe retreat. By obscuring the views between feeding and grazing areas, geese will be discouraged from using them, however, this may be difficult to achieve in historic landscapes.

- Controlling public access

Fencing of water bodies can also be used to influence visitors, by restricting opportunities for feeding geese.

- Interpretation

Many people visiting sites value the waterfowl populations and consequently control measures may be controversial and should not be attempted without interpretation explaining the reasons for, and benefits of, carrying out control. For example, explaining that there are nature conservation benefits in reducing the geese population. Interpretation can also be used to discourage feeding of the birds, and inform people about aquatic ecology.

- Other methods

A number of other techniques can be used but are less well researched. Bird scaring is widely used in some areas on farmland but is less commonly used in aquatic habitats. Many scaring methods are also disturbing to visitors and nearby residents. Chemical repellents are used in North America but with limited effectiveness, and they are not currently approved for use in Britain.

POPULATION-BASED MANAGEMENT

Most population-based management measures require a licence and include:

- Translocation

This method has been used in the past, but is no longer encouraged, as it simply transfers a problem to a different site. It is also an offence to release Canada geese into the wild without a licence. Unless other measures are taken, other geese may colonise a site which has had its previous population removed.

- Egg-pricking, oiling or boiling

These are an effective way of preventing hatching, as birds are very loyal to their nesting sites, but the longevity of geese mean that a long-term programme of this management would be necessary in order to significantly reduce a population. Oiling of eggs kills embryos by depriving them of oxygen. In order to carry out any of these operations, a licence for the work must be obtained (see below). Leaving eggs

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in place but preventing them from hatching means adults continue to protect them. Removal of eggs simply induces the female to lay more.

- Culling

Culling also requires a licence if it is to be done during the close season (1 February to 31 August, or 21 February to 31 August below high water mark). Outside the close season Canada geese can be shot by an authorised person, provided that other regulations concerning firearms safety, capture methods and so forth are adhered to. However this has practical difficulties on many sites. It may be more practical to round up geese during the moult, when they are unable to fly, however culling of geese is a very emotive issue.

LICENSING OF CONTROL OPERATIONS

All wild birds, including Canada geese, are protected under Section 1 of the Wildlife & Countryside Act, 1981. It is an offence to take, damage or destroy their nests or eggs without a licence, and it is also an offence to release them into the wild.

Licences for culling in the close season, egg-pricking or translocation of Canada geese can be issued for a number of reasons:

- To prevent serious damage or disease
- To conserve and protect wild birds
- To conserve flora and fauna
- To preserve public health or safety
- To prevent serious damage to livestock, crops, forestry or fisheries
- For the purposes of air safety

Licences are not issued solely to prevent damage to property.

OTHER BENEFITS OF CONTROL MEASURES

Parks in south-west London developed an integrated management strategy, involving both site-based and population-based control of geese as well as a range of other management techniques, to control populations and it resulted in a number of beneficial side-effects.

The measures taken to reduce numbers of geese were very effective and other waterfowl benefitted greatly from the changes. More species began to regularly

use the ponds, and many species also increased in numbers. This is probably partly because the goose population before control measures began had been extremely high.

The reduction in geese numbers also assisted with attempts to improve water quality, mainly through a reduction of nitrate and phosphorus deposited as droppings in the ponds and lakes. The water bodies now support more invertebrate species and are better able to support aquatic plants, and this will gradually further improve the water quality and dissolved oxygen levels.

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This guidance has been originally written by David Wells and has been revised and updated by Alan Cathersides and Emily Parker.

Published by English Heritage 2014
Product Code: 51922

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ENGLISH HERITAGE

Natural England Technical Information Note TIN008

The management of problems caused by Canada geese: a guide to best practice

The Canada goose population in southern Britain numbers over 80,000 birds and is still increasing. However, in recent years the overall rate of growth has slowed and in some areas numbers have stabilised or declined. The geese live in local populations, usually of up to a few hundred birds, which remain around one or two water bodies that offer suitable habitats for breeding, roosting etc. Because the geese have relatively few predators, and can produce four or five young per year, numbers at particular sites can grow very rapidly and significant problems may occur.

Any management techniques used to control the problems caused by Canada geese must be legal and should take account of the fact that Canada geese are a popular species with many members of the public.

This guidance note aims to provide land managers with the information that they need to manage difficulties caused by Canada geese in a way that is effective, legal and sensitive to public opinion.

The protected status of wild Canada geese

The Canada goose, like all wild birds in Britain, is protected under the EC Wild Birds Directive implemented in Great Britain through the Wildlife and Countryside Act 1981 as amended¹. This Act makes it an offence to capture, kill or injure Canada geese, or to damage or take their nests or eggs. There are exceptions, the most important of which relate to the open season and to actions licensed under Section 16 of the Act.

Open season

Canada geese can be legally shot by authorised persons (that is, persons acting with the authority of the landowners, occupiers and the owners of the shooting rights to the land involved) or trapped by approved methods

during the open season (between 1 September and 31 January, or 20 February inclusive on the foreshore) except on Sundays. Care must be taken to ensure that other regulations concerning firearms safety, capture methods etc are adhered to.



Licensed action

Defra issues a series of general licences under section 16 of the Wildlife and Countryside Act 1981. These allow Canada geese to be killed or taken, and their eggs and nests to be taken, damaged or destroyed for the following purposes (the reference number of the relevant licence is given in brackets):

- preserving public health or safety (GL07);
- preserving air safety (GL06);
- conserving flora and fauna (GL08); and

Natural England Technical Information Note TIN009

The management of problems caused by Canada geese: a guide to best practice

- preventing the spread of disease and preventing serious damage to livestock, foodstuffs for livestock, crops, vegetables, fruit, growing timber, fisheries or inland waters (GL05).

Action can be taken under these licences at any time by authorised persons (for example, persons acting with the authority of the owners or occupier - see the general licences for a full definition).

Action under the authority of a general licence is only permitted if the person contemplating such action is satisfied that appropriate non-lethal methods of control are either ineffective or impracticable. Each general licence specifies a number of conditions that must be complied with. It is therefore essential that anyone considering taking action under a general licence reads the relevant licence before acting.

General licences are available via Natural England's Wildlife Management & Licensing website, and advice on their application is available from staff in the Wildlife Management & Licensing Service. The website address and contact details are given at the end of this leaflet.

Care must be taken to ensure that other regulations concerning firearms safety, capture methods, etc are adhered to.

Prohibited methods

Certain methods of killing and taking birds are prohibited. These include the use of nets, automatic and semi-automatic weapons, and poisoned or stupefying substances. For full details see Section 5 of the Wildlife and Countryside Act 1981. Anyone seeking to use a prohibited method must apply for a licence from Natural England.

The biology and behaviour of Canada geese

In order to develop an effective management strategy for any nuisance wildlife, it is necessary to understand enough about the biology of the species and the local population involved to be able to predict the outcome of whichever

management techniques are chosen. This section gives a brief point by point overview of the biology of Canada geese in Britain insofar as it affects the management of the species.

Breeding

A single clutch of around six eggs is laid in early April each year. Incubation, solely by the female, takes 28-30 days.

Nests are usually close to water bodies, often on islands which provide some protection from predators such as foxes and dogs.

The adult goose defends a small territory around the nest, but is willing to tolerate other pairs nesting nearby, so large colonies can build up on sites with enough nesting territories and adequate food supplies.

The geese are aggressive in defence of their nests and will attack other Canada geese, other waterfowl, and even humans who approach too closely.

Fledging and the moult

The hatched young are flightless for 10 weeks and are protected by the adults on the water at the breeding site.

Mortality rates are highest for very young fledglings, but become little different from adults once the bird is more than a few weeks old.

The adult birds moult around the end of June and are unable to fly for a 3-4 week period.

During the moult both adult and juvenile birds must feed from the water or walk to find food.

The amount of suitable food available at a site during the moult period may be important in governing the number of birds that it can support.

Some birds, which have either not attempted to breed or which have failed to raise a brood, undertake longer journeys to find the best sites to moult.

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Canada geese tend to moult on larger sites with easy access between open water and suitable feeding areas of short grass.

Dispersal

The geese normally remain close to the site where they hatched, and once young birds mature they may wait several years for a breeding territory to become available.

Large flocks of non-breeding adults may thus build up at certain sites.

Some Canada geese remain faithful to their home area for life, even if apparently suitable water bodies with no Canada geese present are available nearby. Others may be resident at many sites, with certain sites used just for breeding, moulting or wintering.

Small numbers abandon their home area either to join other groups or to establish new colonies.

Wintering

Unlike their North American ancestors, Canada geese in Britain are mostly non-migratory, moving only short distances between breeding and wintering sites within their local area.

Birds may fly out from the water bodies where they roost to regular winter feeding sites such as waterside grazing pasture, amenity grassland, etc. They may also move around their home range taking advantage of feeding opportunities such as sprouting winter cereals or root crops as they become available

Causes of mortality

Adult Canada geese have few natural predators in Britain, and most of the known causes of recorded mortality are associated with man's activities. Annual mortality is estimated at between 10% and 20% of the whole population. Juvenile birds have the same level of mortality as adults once they reach their first moult.

The causes of death are:

- 67% shooting
- 4% hitting power lines
- 6% predation

- 23% unknown.

There is little evidence that natural factors (such as limited food availability), which could become more severe as numbers of birds increase, act to control Canada goose numbers.

Low annual mortality, high reproductive rates and the availability of suitable habitat gives the population scope to increase in the absence of management measures.

Problems caused by Canada geese

Grazing and trampling

Canada geese are herbivores, grazing on both land and water plants. Damage to amenity grassland in public parks, where the geese may occupy regular feeding and roosting sites all year round, can be severe.

Unightly and unhygienic areas of mud and droppings which are expensive to re-seed frequently occur. The geese may trample as well as graze pasture and crops.

Fouling with droppings

Because of their inefficient digestive system and the low nutrient value of plant material, Canada geese may need to eat large quantities of vegetation.

When grazing they may produce droppings at a rate of one every six minutes. The droppings contain bacteria that may be harmful if faecal matter is inadvertently swallowed and they also make grassed areas unattractive and paths slippery.

If the droppings are passed into water bodies they may cause increased nutrient loadings leading to possible toxic algal blooms and low oxygen levels in the water.

Damage to wildlife habitat

Canada geese can damage the habitat of other wildlife, for example by grazing or trampling nesting sites of other bird species.

Destruction of waterside habitat, such as reed beds, by Canada geese can be a significant

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problem, leading to erosion of river banks in some cases.

Excluding other wildlife

There is little hard evidence that Canada geese cause significant problems by competing directly with other wildlife.

Aggressive confrontations do occur, and there is some evidence of other large waterfowl being excluded by, or excluding, Canada geese from a preferred breeding site.

Such interactions are rare, however, and are thought to have little effect on the overall populations of other native waterfowl.

Birdstrike hazards to aircraft

The large size of Canada geese makes a collision with an aircraft a particularly hazardous event.

Although no fatal incidents have occurred in the United Kingdom, serious collisions have occurred elsewhere. For example, following a collision with a flock of Canada geese, a United States Air Force AWACS aircraft (a large four-engined jet) crashed killing all on board.

The aviation industry continues to express concern about the increasing numbers of Canada geese on water bodies near aerodromes.

Planning applications involving the creation of water bodies suitable for Canada geese close to aerodromes may be refused on the grounds of flight safety.

Management techniques

Integrated Management Strategies (IMS) for Canada geese

Experience has shown that it is unlikely that a single management technique will be fully effective in controlling a problem caused by Canada geese. For example:

- Fencing an area to keep birds off may cause them to move to an alternative site close by where they could also cause damage. This

may be a suitable option if damage is acceptable on other areas of the site.

- Preventing reproduction by treating eggs to stop hatching will not immediately reduce the population of adults (and hence the levels of damage or nuisance).
- Culling the adult population at a site may simply allow non-breeding adults from nearby waters to move in to vacated breeding territories.

In those cases where effective management of the problem has been achieved, integrated management strategies which combine a number of techniques have invariably been employed. One of the most effective Canada goose management programmes to date involved the development of an IMS that combined reduction of adult numbers, reproductive control and fencing to exclude birds, carried out by Wandsworth Borough Council as part of a larger programme to improve the quality of its urban park lakes.

The scale of management required for a successful IMS

Although the damage or nuisance caused by a group of Canada geese may be occurring at only one site, it is important to remember that the population of geese to which the birds belong may be spread over a number of nearby waters.

When developing an IMS for a particular situation, it will often be necessary to manage birds away from the site where the problem actually occurs. This is especially important if population reduction is to be included in the IMS. For example, if scaring or habitat management proved insufficient to control a problem at a wintering site, and population reduction by egg control or culling became necessary, the breeding and moulting sites used by the wintering birds would need to be identified and the co-operation of the relevant landowners obtained before this strategy could be implemented.

Available techniques for the control of problems caused by Canada geese

The choice of which techniques to combine into an IMS will depend upon the type of damage

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occurring, the type of control needed to reduce the damage to acceptable levels, the biology and distribution of the birds involved and the cost of management relative to the seriousness of the problem. A series of examples are given in the 'Examples of possible Integrated Management Strategies for problems caused by Canada Geese' section of this leaflet.

The techniques available fall into two broad categories; the control of behaviour, by scaring or excluding the birds from the site in question, and the control of numbers, by manipulating the breeding rate or rate of mortality of adult birds. Some of these techniques, especially those involving the manipulation of bird numbers, are permitted by a general licence, and hence can only be carried out for certain purposes. It should be remembered that complete elimination of Canada geese may not be feasible, so consideration should be given to whether the presence of these geese can be tolerated on parts of the site. Where an action is only permitted by a general licence, this is indicated below.

Behaviour modification (scaring, exclusion, repellent chemicals)

Visual scarers

Ground based scarers. Most visual scarers rely on a wild animal's natural fear of the unfamiliar. Scarecrows of various designs, flags and flapping tapes have all been employed to deter geese from areas such as sprouting crops.

However, even migratory goose species learn to ignore these deterrents and Canada geese, which often live close to man, are used to man-made items. Scarecrows, whether human or animal effigies, windmills, rotating mirrors etc, should be placed in the centre of the area where problems are occurring and should be moved every 2 or 3 days to maximise their effect.

Flags or flutter tape should be attached to upright poles at regular intervals across the affected area. In general, the closer the spacing of the flags the greater the deterrent effect is likely to be.

Visual scarers may be effective for short term deterrence of Canada geese from sensitive areas, especially if alternative sites are available nearby.

Kites and balloons. Other visual scaring techniques include kites and balloons, often painted with large eyes or made in the shape of predatory birds. A threat from above may be more intimidating for birds which naturally fear being attacked by birds of prey, and a single balloon may deter birds from a larger area than a ground based scarer.

The devices should be set to fly above the problem area during normal wind conditions. They may need to be re-set if wind direction changes and may not fly well in heavy rain or very strong winds. As with ground based scarers, birds will eventually learn to ignore them and they are best used as short term deterrents when alternative sites are available for the birds to move to.

Kites and balloons are covered by specific aviation legislation. If you wish to use either of these methods as visual scarers you are advised to consult with the Civil Aviation Authority as certain restrictions may be applicable. Their address is given at the end of this leaflet.

Problems with visual scarers. Although effective in the short term, visual scarers have some drawbacks, particularly in situations such as public parks. The scarers may be unattractive and interfere with recreational use of areas and could be subject to theft. They also require maintenance and some need to be moved on a regular basis to maximise their effect. Visual scarers are particularly appropriate for use to protect agricultural crops where the geese need to be excluded for a limited period of time such as during sowing or harvesting.

Acoustic scarers

Acoustic scarers, from the commonly used gas cannon through recorded bird calls to complex solar powered artificial sound generators, are all marketed as being effective in deterring Canada geese.

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Most will deter the birds from relatively small areas provided that there are alternative areas for them to use for roosting or feeding nearby. Like visual scarers, the birds will eventually learn that they offer no threat, although their effectiveness can be prolonged by moving the scarers every two or three days.

Acoustic scarers are often hidden (by deploying them at the edge of a field or behind hay bales or other screens) so that the birds cannot see where the sound is coming from. This is thought to prolong the time before the birds realise that the sound represents no threat, but there is little scientific evidence to support this assertion.

You are advised to you consult your Local Authority if you choose to use acoustic scarers because of their powers under the Environment Protection Act 1990 Part III in respect of noise nuisance which embraces the use of gas bangers and electronic sound generating scaring devices.

Problems with acoustic scarers. As with visual scarers, acoustic scarers may be unsuitable for use in areas frequented by the public due to the sudden loud noises involved, and the relatively expensive equipment may be subject to theft or vandalism. These systems are more likely to be of use to protect agricultural crops or to deter birds from islands or similar remote areas.

Combined visual/acoustic

Some scaring systems combine visual and acoustic stimuli in order to enhance the deterrent effect. Such systems vary from gas cannons which shoot a projectile up a pole when the cannon goes off (in order to simulate a shot bird falling to the ground) to an inflatable rubber man which emerges from a box accompanied by a loud klaxon.

The combination of visual and acoustic stimuli may lengthen the time before the birds habituate to the scarers, and they will benefit from being moved every 2 or 3 days. All of these systems have the same drawbacks as visual or acoustic scarers alone and are suitable for use in similar situations.

Human operated bird control

For many bird species the most effective bird scarer is a human being, armed either with a harmless scaring device such as a flag or firework, or with a shotgun. Where Canada geese are regularly shot, the simple presence of a human may be sufficient to deter birds from an area. In most situations, however, Canada geese show little fear of man, particularly where they are used to being fed by the public.

Even if the geese can be trained to fear humans, the deterrent will only be effective if it is continuously deployed whenever the geese are present. The resulting high cost of human operated scaring of Canada geese, by whatever method, means that it is usually only an effective option when the damage caused is extremely expensive, or where the risks to health and safety are extreme (for example, in preventing birdstrikes to aircraft)

Shooting to support scaring

It is widely believed that periodic shooting of a small number of birds helps to make them more wary, thus making acoustic and visual scarers more effective. While non-lethal shooting to scare can be carried out throughout the year, lethal shooting during the close season or on a Sunday is only permitted under the authority of a licence (see 'Protected Status' section for guidance on licences). Any shooting, whether in the open or close season, must comply with the requirements of the Firearms Act 1968 (as amended).

Chemical repellents

A number of products are currently under development which, when sprayed on vegetation, harmlessly repel wildlife from areas where they are not wanted. Some of these products are currently on sale in the USA and have met with mixed success. At present, there is no repellent chemical available in the UK that is approved for use and is effective against Canada geese. Further field testing will be required before a proper evaluation of available repellent chemicals can be made in the future.

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Habitat management

It may be possible to permanently alter an area where Canada geese are causing problems to make the site permanently unattractive to them. Whilst the features that make a water suitable for Canada geese are not fully understood, enough is known about the biology of the birds to allow a number of suggestions for habitat modifications to be made.

Landscaping: bank steepening and island removal

As with fencing (see below), making it more difficult for Canada geese to walk out of water bodies onto feeding areas by steepening banks may encourage the birds to move elsewhere.

Avoiding shallow marginal areas which support water plants will also restrict the food supply for the geese, but this may adversely affect other waterfowl and/or damage the rest of the aquatic habitat. Safety concerns arising from deep water and steep banks in public areas would also need to be considered.

Because Canada geese prefer to breed on islands, the complete removal of an island could be considered if fencing proved ineffective in discouraging the birds. Low lying islands could be effectively removed by raising water levels in some circumstances. As with all other exclusion or habitat modification techniques, the effect on other wildlife would need to be considered before embarking on such a project.

Barrier planting, marginal vegetation, trees

Establishing areas of dense vegetation along the shores of water bodies (possibly concealing a cheaper fence structure) or breaking up large grass areas with planting which restricts the bird's view of the water (and hence reduces its feeling of safety) have all proved effective in certain circumstances.

If Canada geese do fly out to feed in small areas flanked by hedges and trees, they prefer a shallow climb out angle to aid their escape. Thus, the taller the surrounding vegetation relative to the size of the field or other grazed area the less likely the geese are to use it.

Reducing available foraging areas adjacent to water bodies by changing ground cover

It may be possible to reduce or eliminate Canada goose damage to amenity areas by changing the ground cover planting to species that are not palatable to the geese. Ground cover plants with tough leaves, such as ivy, and many shrub species are not readily eaten by Canada geese and planting the fringes of lakes with a combination of barrier planting and unpalatable ground cover may reduce the feeding opportunities to the point where the geese move elsewhere. Also, allowing short grass to grow long/or mowing alternative feeding areas can also be successful in moving geese within a site and may even reduce geese numbers. However, it should be noted that a change in planting may also affect other waterfowl.

Exclusion

Where scaring of Canada geese is not desirable, it may be possible to exclude the birds from sensitive areas by physically preventing them from gaining access. As with scaring techniques, exclusion is likely to be most effective if alternative sites are available for the birds to move to. However these techniques may create some difficulties as they affect other waterfowl species as well as Canada geese. The erection of fences along a lakeside may also have implications for public safety if someone were to fall into the water and be unable to get out easily.

Fencing

Perhaps the most obvious way to exclude Canada geese is to fence sensitive areas to prevent them gaining access. Despite the fact that the geese can fly, even low fences of between 30 cm to 1 m high can be effective in excluding them from some areas as they prefer to walk to their feeding and roosting sites if possible, often landing and taking off from water.

Thus, fencing the edge of a lake may be sufficient to cause the geese to move elsewhere if they are unable to walk easily out of the water. Canada geese dislike enclosed areas where they cannot easily escape from predators.

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Barriers that divide an area into smaller units may therefore help to discourage the birds from using the site concerned.

Fences have also been successfully used to exclude Canada geese from breeding and roosting sites, especially where alternative sites were available nearby. Fencing the perimeter of park lakes is not necessarily an expensive option because a simple post and chicken wire fence will suffice if properly erected, but a more decorative and permanent structure may involve a significant cost.

Fencing may be a particularly effective option at sites used by moulting Canada geese because if they are prevented from walking out of the water whilst they cannot fly they will not be able to access the protected areas.

Care should be taken, however, to ensure that moulting birds and newly hatch young have access to sufficient suitable grazing areas so they do not starve. A gap at the bottom of the fence of about 8cm will allow smaller waterfowl access to the land. However, any fencing will also deter other geese and mute swans.

Changing cropping patterns

Where agricultural damage is occurring, it may be possible to change the crops being grown to those less susceptible to damage by Canada geese, or to move to crops which are most vulnerable when the geese are elsewhere. This would obviously require a balance to be struck between the economics of moving to a different crop compared to the cost of either tolerating or controlling the damage being suffered.

Population management

In situations where serious problems are being encountered and where habitat management, scaring or exclusion techniques are inappropriate or have been tried and have failed, it may be necessary to reduce the scale of the problem by reducing the size of the goose population at a particular site.

There are a number of techniques that can be used for population management. A range of techniques are permitted under general licence.

Trapping and shooting are also permitted during the open season. No method prohibited under Section 5 Wildlife of the Countryside Act 1981 may be used.

Relocation

Section 14 of the Wildlife and Countryside Act 1981 prohibits the release of Canada geese into the wild without a licence. This offence carries a penalty of a custodial sentence and/or a fine.

The initial response to the first problems caused by Canada geese in the 1950's and 60's was to capture the birds during the flightless period of the moult and to move them to other waters where there were no Canada geese at the time.

Many of the relocated birds simply returned to their original home, whilst those that did remain on the new site began to reproduce rapidly in the new habitat and problems soon began to occur at the new sites as well.

It is thought that these translocations played a significant part in the sudden rapid expansion of the Canada goose population which is continuing today. Because further translocations are likely to accelerate the geographic spread of the species, and may also speed up population growth in newly colonised areas, there is a presumption against issuing licences to relocate Canada geese in the foreseeable future.

For advice on licensing the release of Canada geese contact the Wildlife Management & Licensing Service (see 'Further information' for details).

Shooting (during open season or under a general licence)

Canada geese may be legally shot during the open season (1 September to 31 January, or 20 February inclusive on the foreshore), or under a general licence, by authorised persons (see 'The protected status of wild Canada geese' section of this leaflet). Intensive shooting to reduce population size has additional drawbacks in that it can disturb other waterfowl, and may not be possible in public parks etc for safety and public relations reasons.

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Shooting (under specific licences) has been shown to be effective in scaring Brent Geese, and a sustained programme of shooting during the open season and under a general licence during the close season is likely to be effective against Canada geese.

It should be noted that the sale of dead Canada geese is prohibited under the Wildlife and Countryside Act 1981, therefore arrangements for disposal must be made if birds are shot in large numbers. Carcasses should not be left in places which will be visible to the public. However providing they are not sold, they may be eaten.

Any shooting must be in compliance with the Firearms Act 1968 (as amended).

Egg control (under a general licence)

Treating the eggs of Canada geese to prevent hatching is one of the most commonly used population control techniques during the close season. It is easily carried out and requires effort annually over a limited period. It is also generally regarded by the public as an acceptable means of population control.

Eggs could be removed from nests once the clutch is complete (acting under a general licence), but there is a possibility that the bird will simply lay a second clutch. To avoid this, eggs may be treated to prevent hatching or replaced with dummy eggs so that the goose incubates the eggs as normal and then abandons the clutch when they fail to hatch. There are a variety of treatment methods that are permitted under the general licences:

Egg oiling. Eggs may be coated with mineral oil by rolling them in a small quantity of the oil carried in a polythene bag. The mineral oil sold as liquid paraffin (BP) in chemists is harmless to the birds - note this is not paraffin fuel as used in stoves etc. The oil blocks the pores in the eggshell and starves the embryo of oxygen. This technique is easy to carry out, 100% effective in preventing hatching and does not adversely affect the sitting bird.

Egg pricking. This involves piercing the egg with a pin or small nail and moving this rapidly

around inside the egg to kill the embryo before returning the egg to the nest. Egg pricking must be done carefully as if the bird detects that the eggs are damaged she may desert the nest and lay another clutch.

Boiling. Eggs may be boiled to kill the embryo and returned to the nest. Providing that the treatment is applied early in the incubation cycle, ideally immediately after the clutch is complete, all of these techniques are humane and effective in preventing additional young birds being recruited to the population.

However, because of the low mortality rate of the adults, it may need 80% of all of the eggs on a site to be treated for a number of years before egg control alone will begin to show a reduction in population size. If nests are hard to find or manpower resources limited, egg control alone is likely only to hold the problem at its present level rather than to reduce it significantly.

Round-up and cull of adults during the moult (under a general licence)

The quickest way to achieve a large scale reduction in the number of Canada geese at a site is by the culling of fully grown birds. The effect is immediate and, if the birds can be captured during the moult, most, or all, of a population can be removed. The principal disadvantage of this technique is that it often meets with a strong adverse reaction from the public. The techniques also require some specialist knowledge and considerable manpower if a large scale cull is to be carried out effectively and humanely.

The most common way of removing birds is by capture during the moult. Canada geese moult all of their flight feathers simultaneously, and, for a period of four to six weeks around the end of June and beginning of July, are unable to fly.

The birds form moulting flocks, remaining on the water for most of the time to reduce the risk of predation during this vulnerable period. A number of small boats or canoes can be used to herd the birds towards the bank where a funnel shaped enclosure made of chicken wire supported by fencing stakes is erected. The funnel leads into a catching pen with a

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removable door. The birds are forced up onto the bank and into the mouth of the funnel. The catching party then drive the birds into the funnel and, eventually, into the pen and the door is closed.

This technique requires some experience if it is to be carried out successfully, and expert advice should be sought. Smaller numbers of birds may be captured using nets or similar devices, provided that the method used does not contravene Section 5 of the Wildlife and Countryside Act 1981. It should also be noted that when held in a pen, a net or in the hand, the goose is protected under the Animal Welfare Act 2006 so making it an offence to cause unnecessary suffering. Expert assistance in all of these techniques should be employed.

Once captured, it is necessary to humanely despatch the birds. A number of techniques are allowed by law, but it is best to seek professional advice if a large number of birds needs to be despatched. Employing a veterinary surgeon to despatch the birds by lethal injection or to oversee the whole operation may be advisable to allay the concerns of the general public. Note that, once captured, the birds cannot be released except under licence (see 'Further information'). Therefore, if there is a possibility that not all captured birds will be despatched, a licence to release Canada geese should be sought before the operation is carried out.

Before embarking on the large scale destruction of geese it is important to be sure that the birds that you are removing are actually the ones that are causing the problem. For example, birds causing agricultural damage at a wintering site may moult at a site a considerable distance away. It should also be noted that at long established breeding sites there may be a surplus of birds waiting to occupy breeding territories, but which moult elsewhere.

Thus, a cull of breeding birds may simply create vacant territories for other birds to move into and repeat culls may be necessary for a number of years before the problem is finally brought under control.

It should also be borne in mind that control of adults in urban areas may attract an adverse public reaction, especially in public areas such as parks.

The issue of disposal of carcasses must also be considered, particularly for large numbers of carcasses. Incineration or burial may be considered but there are restrictions and limitations on the use of either method. Three suitable methods may be:

- incineration;
- sending to a rendering plant; or
- landfill.

However, it is recommended that you check for any restrictions or requirements in your particular area and situation.

Examples of possible Integrated Management Strategies for problems caused by Canada geese

The choice of which techniques to use in an IMS will depend on a number of factors specific to the site in question; these include the biology and movement patterns of the birds involved, the severity of the problem, the timescale in which the problem needs to be resolved, possible adverse public reaction, cost and manpower constraints, and whether the purpose of control falls under a relevant general licence. Examples of IMS that might be developed for typical situations are set out below. If in doubt, the landowner or manager should take expert advice on the development of an IMS suitable for his or her particular circumstances.

Example 1

A public park with an ornamental lake and lawns. A resident and growing population of 200 Canada geese with 15 pairs breeding on an island on the lake. Birds range widely over the park, damaging lawns and bankside vegetation and leaving large quantities of droppings which are fouling grassed areas and paths. If the fouling is considered to pose a risk to human health and safety, action against Canada geese and their nests and eggs could be taken all year round under the relevant general licence.

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Suggested IMS. The lake shore and island should be fenced to prevent the birds walking out to feed. If other waterfowl are present, a small gap, of about 8 cm, at the bottom of the fence will allow them to move in and out of the water whilst restricting the movement of the geese.

Consideration should be given to establishing bankside vegetation that is resistant to damage by the geese (the presence of the fence will aid establishment or reinstatement of damaged areas).

Flutter tape or other scarers may be deployed to keep the geese off badly damaged areas. In order to prevent further population increase, the eggs of any birds that breed on the island (despite the fencing) should be treated under the relevant general licence (for the purpose of preserving public health and safety) if droppings in public areas pose a hazard to the general public using the park.

These techniques should be monitored for at least two years in order to assess their effectiveness. If problems persist, a cull of birds may be necessary, with sufficient birds being captured during the moult to reduce the population to the desired level, followed by ongoing egg control to keep the population under control.

Example 2

A kept country estate with a large lake which is used as a fishery and a waterfowl shoot in winter. A summer population of 200 Canada geese with 40 breeding pairs along the lake shore. Non-breeding birds moult at a large reservoir nearby and additional birds from other breeding sites frequent the water in winter, swelling the population to 400 birds. The geese are damaging grazing pasture and destroying bankside vegetation which is used as nesting habitat by other waterfowl. Canada goose droppings are thought to be polluting the water.

Suggested IMS. Increasing the in-season shooting pressure on the geese may be sufficient to encourage the wintering population to move to the other waters nearby.

The estate could consider organised goose shoots which may help to bring in income. Visual or acoustic scarers should be deployed to protect grazing pasture from damage during the summer months. Out of season shooting to augment this scaring could be carried out under the general licence for the purpose of preventing damage to the grazing pasture and possibly the fishery.

The summering population could be further managed by fencing the lake edge and planting unpalatable barrier vegetation (which would double as nesting cover for other waterfowl species). If this was insufficient to reduce numbers of breeding birds, the landowner could (under a relevant general licence) treat eggs to prevent hatching.

Culling is unlikely to be immediately effective in this case unless the exercise can be carried out both on the estate lake and the nearby reservoir. A cull on the estate lake would simply make breeding territories available to non-breeding birds which would rapidly move in, necessitating repeat culls over a number of years.

Example 3

A farm adjacent to a large reservoir, part of which is a designated nature reserve. A resident population of 600 Canada geese with 30 breeding pairs occupy the reservoir all year round. The birds fly out from the reservoir to feed, damaging newly sprouted winter cereals and other crops.

Suggested IMS. In these circumstances, the attitude of the reservoir managers and others with interests in managing the nature reserve (eg local wildlife trusts etc) are crucial. If the owners of the reservoir are opposed to any control action designed to reduce the population, then the farmer is limited to shooting in season and under a general licence (to prevent damage to crops), scaring, or changing his cropping patterns to minimise damage.

Considerable effort and expense may be required to sustain the scaring effort needed over the period necessary to protect his crop.

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Acoustic and visual scarers should be deployed and moved at regular intervals to maximise their effect.

Regular shooting of the Canada geese should aid the effectiveness of the scaring, and may encourage the birds to feed elsewhere, especially if there are alternative feeding sites nearby. Population management (under the general licence for the purpose of preventing serious damage to crops), either in the form of egg control, or a flightless cull, would only be possible with the co-operation of the owners of the reservoir.

Further information

In England, further advice on dealing with Canada goose problems, as well as problems caused by other birds and mammals can be obtained by contacting Wildlife Management and Licensing at:

Natural England, Wildlife Licensing Unit, First Floor, Temple Quay House, 2 The Square, Bristol, BS1 6EB

Telephone: 0845 601 4523 (local rate)
Fax: 0845 601 3438 (local rate)E-mail:
wildlife@naturalengland.org.uk

The general licences and a range of leaflets on wildlife topics, are available online at:
www.naturalengland.org.uk/ourwork/regulation/wildlife/default.aspx

Natural England Technical Information Notes are available to download from the Natural England website: www.naturalengland.org.uk. In particular see:

- Technical Information Note TIN046: *Control of Canada geese: round-up and cull during the moult (flightless period)*

For information on other Natural England publications contact the Natural England Enquiry Service on 0845 600 3078 or e-mail enquiries@naturalengland.org.uk

Advice on biology and management

- Natural England's Wildlife Licensing Unit (address above).
- Food and Environment Research Agency (formerly Central Science Laboratory), Sand Hutton, York, YO41 1LZ.
- The Wildfowl and Wetlands Trust, Slimbridge, Gloucestershire, GL2 7BT.

Advice on scaring techniques

- Natural England's Wildlife Licensing Unit (address above)
- National Farmers Union, Agriculture House, 164 Shaftesbury Avenue, London, WC2H 8HL. Tel: 0171 331 7200
- Civil Aviation Authority, CAA House, 45-59 Kingsway, London, WC2B 6TE. Tel. 020 7379 7311
- The British Association for Shooting and Conservation (BASC), Marford Mill, Rossett, Wrexham, LL12 0HL. Tel: 01244 573000. E-mail: enq@basc.demon.co.uk
- BASC's fact sheet Canada geese: a guide to legal control measures is available from the BASC website: www.basc.org.uk/

Advice on shooting and connected issues

- The British Association for Shooting and Conservation (address above).

Advice on carcase disposal and acoustic scarers

- Local Authority - (your Local Authorities address can be found in the telephone directory).

Further reading

Allan J.R. Kirby J.S. & Feare C.J. (1995) The biology of Canada geese (*Branta canadensis*) in relation to the management of feral populations. *Wildlife Biology Vol. 1* p 129-143.

Department of the Environment Transport and the Regions (1998) *Population Dynamics of Canada Geese in Great Britain and Implications for Future Management*. Report by Wildfowl and Wetlands Trust and British Trust for Ornithology.

Department of the Environment Transport and the Regions (1998) *Canada Goose Research*

Natural England Technical Information Note TIN009

The management of problems caused by Canada geese: a guide to best practice

Project: Control Measures and Study of Related Canada Goose Problems.

Wandsworth Borough Council (undated) *London Lakes Project Overview Document*. Obtainable from Wandsworth BC price £15

National Farmers Union: *Leaflet; code of practice on bird scaring*

This leaflet was produced by Natural England and the Central Science Laboratory, now known as the Food and Environmental Research Agency (FERA).

Photograph courtesy of Anthony O'Connor, Natural England.

Footnote : Amended in England and Wales through the Countryside and Rights of Way Act 2000, the Wildlife and Countryside (England and Wales) (Amendment) Regulations 2004, and in Scotland through the Nature Conservation (Scotland) Act 2004.

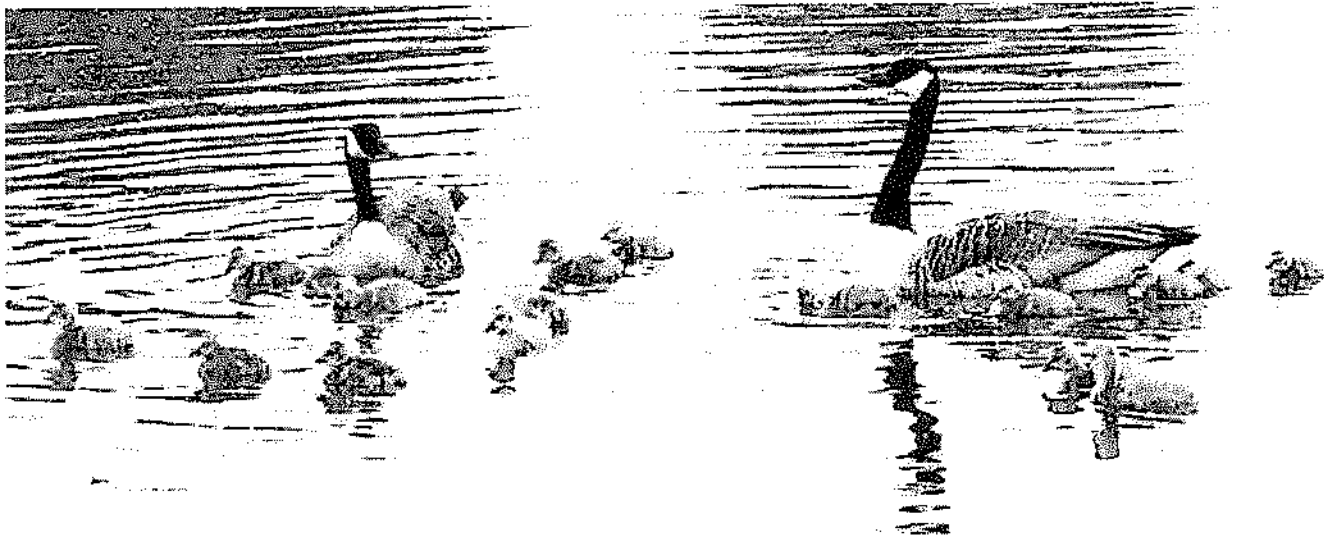
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The management of problems caused by Canada geese: a guide to best practice

The Canada goose population in southern Britain numbers over 80,000 birds and is still increasing. However, in recent years the overall rate of growth has slowed and in some areas numbers have stabilised or declined. The geese live in local populations, usually of up to a few hundred birds, which remain around one or two water bodies that offer suitable habitats for breeding, roosting etc. Because the geese have relatively few predators, and can produce four or five young per year, numbers at particular sites can grow very rapidly and significant problems may occur.

Any management techniques used to control the problems caused by Canada geese must be legal and should take account of the fact that Canada geese are a popular species with many members of the general public.

This guidance note aims to provide land managers with the information that they need to manage difficulties caused by Canada geese in a way that is effective, legal and sensitive to public opinion.



First Edition
Published July 2005

Rural Development
Service



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The Protected Status of Wild Canada Geese

The Canada goose, like all wild birds in Britain, is protected under the EC Wild Birds Directive implemented in Great Britain through the Wildlife and Countryside Act (1981) as amended¹. This Act makes it an offence to capture, kill or injure Canada geese, or to damage or take their nests or eggs. There are exceptions, the most important of which relate to the open season and to actions **licensed under Section 16 of the Act**.

Open season

Canada geese can be legally shot by authorised persons (i.e. persons acting with the authority of the landowners, occupiers and the owners of the shooting rights to the land involved) or trapped by approved methods during the open season (between September 1st and January 31st, or February 20th inclusive on the foreshore) except on Sundays. Care must be taken to ensure that other regulations concerning firearms safety, capture methods etc. are adhered to.

Licensed action

Defra issues a series of general licences under section 16 of the Wildlife and Countryside Act 1981. These allow Canada geese to be killed or taken, and their eggs and nests to be taken, damaged or destroyed for the following purposes (the reference number of the relevant licence is given in brackets):

- preserving public health or safety (WLF100088);
- preserving air safety (WLF100085);
- preventing the spread of disease and preventing serious damage to livestock, foodstuffs for livestock, crops, vegetables, fruit, growing timber, fisheries or inland waters (WLF18).

Action can be taken under these licences at any time by authorised persons (e.g. persons acting with the authority of the owners or occupier – see the general licences for a full definition).

Action under the authority of a general licence is only permitted if the person contemplating such action is satisfied that appropriate non-lethal methods of control are either ineffective or impracticable. Each general licence specifies a number of conditions that must be complied with. It is therefore essential that anyone considering taking action under a general licence reads the relevant licence before acting.

General licences are published on Defra's Wildlife Management website, and advice on their application is available from staff in the National Wildlife Management Team. The website address and contact details are given at the end of this leaflet.

Care must be taken to ensure that other regulations concerning firearms safety, capture methods, etc. are adhered to.

Prohibited methods

Certain methods of killing and taking birds are prohibited. These include the use of nets, automatic and semi-automatic weapons, and poisoned or stupefying substances. For full details see section 5 of the Wildlife and Countryside Act 1981. Anyone seeking to use a prohibited method must apply for a licence from either the Department for Environment, Food and Rural Affairs (Defra) or English Nature. English Nature issue licences for the control of Canada geese for conservation purposes (see Further Information section below).

The Biology and Behaviour of Canada Geese

In order to develop an effective management strategy for any nuisance wildlife, it is necessary to understand enough about the biology of the species and the local population involved to be able to predict the outcome of whichever management techniques are chosen. This section gives a brief point by point overview of the biology of Canada geese in Britain insofar as it affects the management of the species.

Breeding

- A single clutch of around 6 eggs is laid in early April each year.
- Incubation, solely by the female, takes 28-30 days.
- Nests are usually close to water bodies, often on islands which provide some protection from predators such as foxes and dogs.
- The adult goose defends a small territory around the nest, but is willing to tolerate other pairs nesting nearby, so large colonies can build up on sites with enough nesting territories and adequate food supplies.
- The geese are aggressive in defence of their nests and will attack other Canada geese, other waterfowl, and even humans who approach too closely.

Fledging and the moult

- The hatched young are flightless for 10 weeks and are protected by the adults on the water at the breeding site.
- Mortality rates are highest for very young fledglings, but become little different from adults once the bird is more than a few weeks old.
- The adult birds moult around the end of June and are unable to fly for a 3-4 week period.

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- During the moult both adult and juvenile birds must feed from the water or wade to find food.
- The amount of suitable food available at a site during the moult period may be important in governing the number of birds that it can support.
- Some birds, which have either not attempted to breed or which have failed to raise a brood, undertake longer journeys to find the best sites to moult.
- Canada geese tend to moult on larger sites with easy access between open water and suitable feeding areas of short grass.

Dispersal

- The geese normally remain close to the site where they hatched, and once young birds mature they may wait several years for a breeding territory to become available.
- Large flocks of non-breeding adults may thus build up at certain sites.
- Some Canada geese remain faithful to their home area for life, even if apparently suitable water bodies with no Canada geese present are available nearby. Others may be resident at many sites, with certain sites used just for breeding, moulting or wintering.
- Small numbers abandon their home area either to join other groups or to establish new colonies.

Wintering

- Unlike their North American ancestors, Canada geese in Britain are mostly non-migratory, moving only short distances between breeding and wintering sites within their local area.
- Birds may fly out from the water bodies where they roost to regular winter feeding sites such as waterside grazing pasture, amenity grassland, etc. They may also move around their home range taking advantage of feeding opportunities such as sprouting winter cereals or root crops as they become available

Causes of mortality

- Adult Canada geese have few natural predators in Britain, and most of the known causes of recorded mortality are associated with man's activities. Annual mortality is estimated at between 10 and 20% of the whole population. Juvenile birds have the same level of mortality as adults once they reach their first moult.
- The causes of death are:
 - 67% shooting
 - 4% hitting power lines

- 6% predation
- 23% unknown.

- There is little evidence that natural factors (such as limited food availability), which could become more severe as numbers of birds increase, act to control Canada goose numbers.
- Low annual mortality, high reproductive rates and the availability of suitable habitat gives the population scope to increase in the absence of management measures.

Problems Caused by Canada Geese**Grazing and trampling**

- Canada geese are herbivores, grazing on both land and water plants.
- Damage to amenity grassland in public parks, where the geese may occupy regular feeding and roosting sites all year round, can be severe.
- Unsightly and unhygienic areas of mud and droppings which are expensive to re-seed frequently occur.
- The geese may trample as well as graze pasture and crops.

Fouling with droppings

- Because of their inefficient digestive system and the low nutrient value of plant material, Canada geese may need to eat large quantities of vegetation.
- When grazing they may produce droppings at a rate of one every 6 minutes.
- The droppings contain bacteria that may be harmful if faecal matter is inadvertently swallowed and they also make grassed areas unattractive and paths slippery.
- If the droppings are passed into water bodies they may cause increased nutrient loadings leading to possible toxic algal blooms and low oxygen levels in the water.

Damage to wildlife habitat

- Canada geese can damage the habitat of other wildlife, for example by grazing or trampling nesting sites of other bird species.
- Destruction of waterside habitat, such as reed beds, by Canada geese can be a significant problem, leading to erosion of river banks in some cases.

Excluding other wildlife

- There is little hard evidence that Canada geese cause significant problems by competing directly with other wildlife.

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- Aggressive confrontations do occur, and there is some evidence of other large waterfowl being excluded by, or excluding, Canada geese from a preferred breeding site.

Such interactions are rare, however, and are thought to have little effect on the overall populations of other native waterfowl.

Birdstrike hazards to aircraft

- The large size of Canada geese makes a collision with an aircraft a particularly hazardous event.
- Although no fatal incidents have occurred in the United Kingdom, serious collisions have occurred elsewhere. For example, following a collision with a flock of Canada geese, a United States Air Force AWACS aircraft (a large four-engined jet) crashed killing all on board.
- The aviation industry continues to express concern about the increasing numbers of Canada geese on water bodies near aerodromes.
- Planning applications involving the creation of water bodies suitable for Canada geese close to aerodromes may be refused on the grounds of flight safety.

Management Techniques**Integrated Management Strategies (IMS) for Canada Geese**

Experience has shown that it is unlikely that a single management technique will be fully effective in controlling a problem caused by Canada geese. For example:

- Fencing an area to keep birds off may cause them to move to an alternative site close by where they could also cause damage. This may be a suitable option if damage is acceptable on other areas of the site.
- Preventing reproduction by treating eggs to stop hatching will not immediately reduce the population of adults (and hence the levels of damage or nuisance).
- Culling the adult population at a site may simply allow non-breeding adults from nearby waters to move in to vacated breeding territories.

In those cases where effective management of the problem has been achieved, integrated management strategies which combine a number of techniques have invariably been employed. One of the most effective Canada goose management programmes to date involved the development of an IMS that combined reduction of adult numbers, reproductive control and fencing to exclude birds, carried out by Wandsworth

Borough Council as part of a larger programme to improve the quality of its urban park lakes.

The scale of management required for a successful IMS

Although the damage or nuisance caused by a group of Canada geese may be occurring at only one site, it is important to remember that the population of geese to which the birds belong may be spread over a number of nearby waters. When developing an IMS for a particular situation, it will often be necessary to manage birds away from the site where the problem actually occurs. This is especially important if population reduction is to be included in the IMS. For example, if scaring or habitat management proved insufficient to control a problem at a wintering site, and population reduction by egg control or culling became necessary, the breeding and moulting sites used by the wintering birds would need to be identified and the co-operation of the relevant landowners obtained before this strategy could be implemented.

Available techniques for the control of problems caused by Canada Geese

The choice of which techniques to combine into an IMS will depend upon the type of damage occurring, the type of control needed to reduce the damage to acceptable levels, the biology and distribution of the birds involved and the cost of management relative to the seriousness of the problem. A series of examples are given in the 'Examples of possible Integrated Management Strategies for problems caused by Canada Geese' section of this leaflet.

The techniques available fall into two broad categories; the control of behaviour, by scaring or excluding the birds from the site in question, and the control of numbers, by manipulating the breeding rate or rate of mortality of adult birds. Some of these techniques, especially those involving the manipulation of bird numbers, are permitted by a general licence, and hence can only be carried out for certain purposes. It should be remembered that complete elimination of Canada geese may not be feasible, so consideration should be given to whether the presence of these geese can be tolerated on parts of the site. Where an action is only permitted by a general licence, this is indicated below.

Behaviour modification (scaring, exclusion, repellent chemicals)

Visual scarers**Ground based scarers**

Most visual scarers rely on a wild animal's natural fear of the unfamiliar. Scarecrows of various designs, flags

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and flapping tapes have all been employed to deter geese from areas such as sprouting crops. However, even migratory goose species learn to ignore these deterrents and Canada geese, which often live close to man, are used to man-made items. Scarecrows, whether human or animal effigies, windmills, rotating mirrors etc., should be placed in the centre of the area where problems are occurring and should be moved every 2 or 3 days to maximise their effect. Flags or flutter tape should be attached to upright poles at regular intervals across the affected area. In general, the closer the spacing of the flags the greater the deterrent effect is likely to be. Visual scarers may be effective for short term deterrence of Canada geese from sensitive areas, especially if alternative sites are available nearby.

Kites and balloons

Other visual scaring techniques include kites and balloons, often painted with large eyes or made in the shape of predatory birds. A threat from above may be more intimidating for birds which naturally fear being attacked by birds of prey, and a single balloon may deter birds from a larger area than a ground based scarer. The devices should be set to fly above the problem area during normal wind conditions. They may need to be re-set if wind direction changes and may not fly well in heavy rain or very strong winds. As with ground based scarers, birds will eventually learn to ignore them and they are best used as short term deterrents when alternative sites are available for the birds to move to.

Kites and balloons are covered by specific aviation legislation. If you wish to use either of these methods as visual scarers you are advised to consult with the Civil Aviation Authority as certain restrictions may be applicable. Their address is given at the end of this leaflet.

Problems with visual scarers

Although effective in the short term, visual scarers have some drawbacks, particularly in situations such as public parks. The scarers may be unattractive and interfere with recreational use of areas and could be subject to theft. They also require maintenance and some need to be moved on a regular basis to maximise their effect. Visual scarers are particularly appropriate for use to protect agricultural crops where the geese need to be excluded for a limited period of time such as during sowing or harvesting.

Acoustic scarers

Acoustic scarers, from the commonly used gas cannon through recorded bird calls to complex solar powered

artificial sound generators, are all marketed as being effective in deterring Canada geese. Most will deter the birds from relatively small areas provided that there are alternative areas for them to use for roosting or feeding nearby. Like visual scarers, the birds will eventually learn that they offer no threat, although their effectiveness can be prolonged by moving the scarers every two or three days. Acoustic scarers are often hidden (by deploying them at the edge of a field or behind hay bales or other screens) so that the birds cannot see where the sound is coming from. This is thought to prolong the time before the birds realise that the sound represents no threat, but there is little scientific evidence to support this assertion. It is advised that you consult your Local Authority if you choose to use acoustic scarers because of their powers under the Environment Protection Act 1990 Part III in respect of noise nuisance which embraces the use of gas bangers and electronic sound generating scaring devices.

Problems with acoustic scarers

As with visual scarers, acoustic scarers may be unsuitable for use in areas frequented by the public due to the sudden loud noises involved, and the relatively expensive equipment may be subject to theft or vandalism. These systems are more likely to be of use to protect agricultural crops or to deter birds from islands or similar remote areas.

Combined visual/acoustic

Some scaring systems combine visual and acoustic stimuli in order to enhance the deterrent effect. Such systems vary from gas cannons which shoot a projectile up a pole when the cannon goes off (in order to simulate a shot bird falling to the ground) to an inflatable rubber man which emerges from a box accompanied by a loud klaxon. The combination of visual and acoustic stimuli may lengthen the time before the birds habituate to the scarers, and they will benefit from being moved every 2 or 3 days. All of these systems have the same drawbacks as visual or acoustic scarers alone and are suitable for use in similar situations.

Human operated bird control

For many bird species the most effective bird scarer is a human being, armed either with a harmless scaring device such as a flag or firework, or with a shotgun. Where Canada geese are regularly shot, the simple presence of a human may be sufficient to deter birds from an area. In most situations, however, Canada geese show little fear of man, particularly where they are used to being fed by the public. Even if the geese can be trained to fear humans, the deterrent will only

be effective if it is continuously deployed whenever the geese are present. The resulting high cost of human operated scaring of Canada geese, by whatever method, means that it is usually only an effective option when the damage caused is extremely expensive, or where the risks to health and safety are extreme (e.g. in preventing birdstrikes to aircraft)

Shooting to support scaring

It is widely believed that periodic shooting of a small number of birds helps to make them more wary, thus making acoustic and visual scarers more effective. While non-lethal shooting to scare can be carried out throughout the year, lethal shooting during the close season or on a Sunday is only permitted under the authority of a licence (see "Protected Status" section for guidance on licences). Any shooting, whether in the open or close season, must comply with the requirements of the Firearms Act 1968 (as amended).

Chemical repellents

A number of products are currently under development which, when sprayed on vegetation, harmlessly repel wildlife from areas where they are not wanted. Some of these products are currently on sale in the USA and have met with mixed success. At present, there is no repellent chemical available in the UK that is approved for use and is effective against Canada geese. Further field testing will be required before a proper evaluation of available repellent chemicals can be made in the future

Habitat management

It may be possible to permanently alter an area where Canada geese are causing problems to make the site permanently unattractive to them. Whilst the features that make a water suitable for Canada geese are not fully understood, enough is known about the biology of the birds to allow a number of suggestions for habitat modifications to be made.

Landscaping: bank steepening and island removal

As with fencing (see below), making it more difficult for Canada geese to walk out of water bodies onto feeding areas by steepening banks may encourage the birds to move elsewhere. Avoiding shallow marginal areas which support water plants will also restrict the food supply for the geese, but this may adversely affect other waterfowl and/or damage the rest of the aquatic habitat. Safety concerns arising from deep water and steep banks in public areas would also need to be considered. Because Canada geese prefer to breed on islands, the complete removal of an island could be considered if fencing proved ineffective in discouraging the birds. Low lying islands could be effectively

removed by raising water levels in some circumstances. As with all other exclusion or habitat modification techniques, the effect on other wildlife would need to be considered before embarking on such a project.

Barrier planting, marginal vegetation, trees

Establishing areas of dense vegetation along the shores of water bodies (possibly concealing a cheaper fence structure) or breaking up large grass areas with planting which restricts the bird's view of the water (and hence reduces its feeling of safety) have all proved effective in certain circumstances. If Canada geese do fly out to feed in small areas flanked by hedges and trees, they prefer a shallow climb out angle to aid their escape. Thus, the taller the surrounding vegetation relative to the size of the field or other grazed area the less likely the geese are to use it.

Reducing available foraging areas adjacent to water bodies by changing ground cover

It may be possible to reduce or eliminate Canada goose damage to amenity areas by changing the ground cover planting to species that are not palatable to the geese. Ground cover plants with tough leaves, such as Ivy, and many shrub species are not readily eaten by Canada geese and planting the fringes of lakes with a combination of barrier planting and unpalatable ground cover may reduce the feeding opportunities to the point where the geese move elsewhere. Also, allowing short grass to grow long/or mowing alternative feeding areas can also be successful in moving geese within a site and may even reduce geese numbers. However, it should be noted that a change in planting may also affect other waterfowl.

Exclusion

Where scaring of Canada geese is not desirable, it may be possible to exclude the birds from sensitive areas by physically preventing them from gaining access. As with scaring techniques, exclusion is likely to be most effective if alternative sites are available for the birds to move to. However these techniques may create some difficulties as they affect other waterfowl species as well as Canada geese. The erection of fences along a lakeside may also have implications for public safety if someone were to fall into the water and be unable to get out easily.

Fencing

Perhaps the most obvious way to exclude Canada geese is to fence sensitive areas to prevent them gaining access. Despite the fact that the geese can fly,

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even low fences of between 0.3 - 1m high can be effective in excluding them from some areas as they prefer to walk to their feeding and roosting sites if possible, often landing and taking off from water. Thus, fencing the edge of a lake may be sufficient to cause the geese to move elsewhere if they are unable to walk easily out of the water. Canada geese dislike enclosed areas where they cannot easily escape from predators. Barriers that divide an area into smaller units may therefore help to discourage the birds from using the site concerned.

Fences have also been successfully used to exclude Canada geese from breeding and roosting sites, especially where alternative sites were available nearby. Fencing the perimeter of park lakes is not necessarily an expensive option because a simple post and chicken wire fence will suffice if properly erected, but a more decorative and permanent structure may involve a significant cost. Fencing may be a particularly effective option at sites used by moulting Canada geese because if they are prevented from walking out of the water whilst they cannot fly they will not be able to access the protected areas. Care should be taken, however, to ensure that moulting birds and newly hatch young have access to sufficient suitable grazing areas so they do not starve. A gap at the bottom of the fence of about 8cm will allow smaller waterfowl access to the land. However, any fencing will also deter other geese and mute swans.

Changing cropping patterns

Where agricultural damage is occurring, it may be possible to change the crops being grown to those less susceptible to damage by Canada geese, or to move to crops which are most vulnerable when the geese are elsewhere. This would obviously require a balance to be struck between the economics of moving to a different crop compared to the cost of either tolerating or controlling the damage being suffered.

Population management

In situations where serious problems are being encountered and where habitat management, scaring or exclusion techniques are inappropriate or have been tried and have failed, it may be necessary to reduce the scale of the problem by reducing the size of the goose population at a particular site. There are a number of techniques that can be used for population management. A range of techniques are permitted under general licence. Trapping and shooting are also permitted during the open season. No method prohibited under section 5 Wildlife of the Countryside Act 1981 may be used.

Relocation

Section 14 of the Wildlife and Countryside Act 1981 prohibits the release of Canada geese into the wild without a licence. This offence carries a penalty of a custodial sentence and/or a fine.

The initial response to the first problems caused by Canada geese in the 1950's and 60's was to capture the birds during the flightless period of the moult and to move them to other waters where there were no Canada geese at the time. Many of the relocated birds simply returned to their original home, whilst those that did remain on the new site began to reproduce rapidly in the new habitat and problems soon began to occur at the new sites as well. It is thought that these translocations played a significant part in the sudden rapid expansion of the Canada goose population which is continuing today. Because further translocations are likely to accelerate the geographic spread of the species, and may also speed up population growth in newly colonised areas, it is unlikely that licences will be granted to relocate Canada geese in the foreseeable future.

For advice on licensing the release of Canada geese contact the Non-native Regulation Team (see "Further Information" for details).

Shooting (during open season or under a general licence)

Canada geese may be legally shot during the open season (1st September to 31st January, or 20th February inclusive on the foreshore), or under a general licence, by authorised persons (see 'The Protected Status of Wild Canada Geese' section of this leaflet). Intensive shooting to reduce population size has additional drawbacks in that it can disturb other waterfowl, and may not be possible in public parks etc. for safety and public relations reasons.

Shooting (under specific licences) has been shown to be effective in scaring Brent Geese, and a sustained programme of shooting during the open season and under a general licence during the close season is likely to be effective against Canada geese.

It should be noted that the sale of dead Canada geese is prohibited under the Wildlife and Countryside Act 1981, therefore arrangements for disposal must be made if birds are shot in large numbers. Carcasses should not be left in places which will be visible to the public. However providing they are not sold, they may be eaten.

Any shooting must be in compliance with the Firearms Act 1968 (as amended).

Egg control (under a general licence)

Treating the eggs of Canada geese to prevent hatching is one of the most commonly used population control techniques during the close season. It is easily carried out and requires effort annually over a limited period. It is also generally regarded by the public as an acceptable means of population control. Eggs could be removed from nests once the clutch is complete (acting under a general licence), but there is a possibility that the bird will simply lay a second clutch. To avoid this, eggs may be treated to prevent hatching or replaced with dummy eggs so that the goose incubates the eggs as normal and then abandons the clutch when they fail to hatch. There are a variety of treatment methods that are permitted under the general licences:

- **Egg oiling.** Eggs may be coated with mineral oil by rolling them in a small quantity of the oil carried in a polythene bag. The mineral oil sold as liquid paraffin (BP) in chemists is harmless to the birds - note this is not paraffin fuel as used in stoves etc. The oil blocks the pores in the eggshell and starves the embryo of oxygen. This technique is easy to carry out, 100% effective in preventing hatching and does not adversely affect the sitting bird.
- **Egg pricking.** This involves piercing the egg with a pin or small nail and moving this rapidly around inside the egg to kill the embryo before returning the egg to the nest. Egg pricking must be done carefully as if the bird detects that the eggs are damaged she may desert the nest and lay another clutch.
- **Boiling.** Eggs may be boiled to kill the embryo and returned to the nest.

Providing that the treatment is applied early in the incubation cycle, ideally immediately after the clutch is complete, all of these techniques are humane and effective in preventing additional young birds being recruited to the population. However, because of the low mortality rate of the adults, it may need 80% of all of the eggs on a site to be treated for a number of years before egg control alone will begin to show a reduction in population size. If nests are hard to find or manpower resources limited, egg control alone is likely only to hold the problem at its present level rather than to reduce it significantly.

Round-up and cull of adults during the moult (under a general licence)

The quickest way to achieve a large scale reduction in the number of Canada geese at a site is by the culling of fully grown birds. The effect is immediate and, if the birds can be captured during the moult, most, or all, of a population can be removed. The principal

disadvantage of this technique is that it often meets with a strong adverse reaction from the public. The techniques also require some specialist knowledge and considerable manpower if a large scale cull is to be carried out effectively and humanely.

The most common way of removing birds is by capture during the moult. Canada geese moult all of their flight feathers simultaneously, and, for a period of four to six weeks around the end of June and beginning of July, are unable to fly. The birds form moulting flocks, remaining on the water for most of the time to reduce the risk of predation during this vulnerable period. A number of small boats or canoes can be used to herd the birds towards the bank where a funnel shaped enclosure made of chicken wire supported by fencing stakes is erected. The funnel leads into a catching pen with a removable door. The birds are forced up onto the bank and into the mouth of the funnel. The catching party then drive the birds into the funnel and, eventually, into the pen and the door is closed. This technique requires some experience if it is to be carried out successfully, and expert advice should be sought. Smaller numbers of birds may be captured using nets or similar devices, provided that the method used does not contravene Section 5 of the Wildlife and Countryside Act 1981. Again, expert assistance should be employed.

Once captured, it is necessary to humanely despatch the birds. A number of techniques are allowed by law, but it is best to seek professional advice if a large number of birds needs to be despatched. Employing a veterinary surgeon to despatch the birds by lethal injection or to oversee the whole operation may be advisable to allay the concerns of the general public. Note that, once captured, the birds cannot be released except under licence (see Further Information). Therefore, if there is a possibility that not all captured birds will be despatched, a licence to release Canada geese should be sought before the operation is carried out.

Before embarking on the large scale destruction of geese it is important to be sure that the birds that you are removing are actually the ones that are causing the problem. For example, birds causing agricultural damage at a wintering site may moult at a site a considerable distance away. It should also be noted that at long established breeding sites there may be a surplus of birds waiting to occupy breeding territories, but which moult elsewhere. Thus, a cull of breeding birds may simply create vacant territories for other birds to move into and repeat culls may be necessary for a number of years before the problem is finally

brought under control. It should also be borne in mind that control of adults in urban areas may attract an adverse public reaction, especially in public areas such as parks.

The issue of disposal of carcasses must also be considered, particularly for large numbers of carcasses. Incineration or burial may be considered but there are restrictions and limitations on the use of either method. Three suitable methods may be:

- incineration;
- sending to a rendering plant; or
- landfill!

However, you should consult your local authority in the first instance about suitable methods for your particular situation.

Examples of possible Integrated Management Strategies for problems caused by Canada Geese

The choice of which techniques to use in an IMS will depend on a number of factors specific to the site in question; these include the biology and movement patterns of the birds involved, the severity of the problem, the timescale in which the problem needs to be resolved, possible adverse public reaction, cost and manpower constraints, and whether the purpose of control falls under a relevant general licence.

Examples of IMS that might be developed for typical situations are set out below. If in doubt, the landowner or manager should take expert advice on the development of an IMS suitable for his or her particular circumstances.

Example 1

A public park with an ornamental lake and lawns. A resident and growing population of 200 Canada geese with 15 pairs breeding on an island on the lake. Birds range widely over the park, damaging lawns and bankside vegetation and leaving large quantities of droppings which are fouling grassed areas and paths. If the fouling is considered to pose a risk to human health and safety, action against Canada geese and their nests and eggs could be taken all year round under the relevant general licence.

Suggested IMS:

The lake shore and island should be fenced to prevent the birds walking out to feed. If other waterfowl are present, a small gap, of about 8 cm, at the bottom of the fence will allow them to move in and out of the water whilst restricting the movement of the geese. Consideration should be given to establishing bankside vegetation that is resistant to damage by the geese (the presence of the fence will aid establishment or

reinstatement of damaged areas). Flutter tape or other scarers may be deployed to keep the geese off badly damaged areas. In order to prevent further population increase, the eggs of any birds that breed on the island (despite the fencing) should be treated under the relevant general licence (for the purpose of preserving public health and safety) if droppings in public areas pose a hazard to the general public using the park. These techniques should be monitored for at least two years in order to assess their effectiveness. If problems persist, a cull of birds may be necessary, with sufficient birds being captured during the moult to reduce the population to the desired level, followed by ongoing egg control to keep the population under control.

Example 2

A kept country estate with a large lake which is used as a fishery and a waterfowl shoot in winter. A summer population of 200 Canada geese with 40 breeding pairs along the lake shore. Non-breeding birds moult at a large reservoir nearby and additional birds from other breeding sites frequent the water in winter, swelling the population to 400 birds. The geese are damaging grazing pasture and destroying bankside vegetation which is used as nesting habitat by other waterfowl. Canada goose droppings are thought to be polluting the water.

Suggested IMS:

Increasing the in-season shooting pressure on the geese may be sufficient to encourage the wintering population to move to the other waters nearby. The estate could consider organised goose shoots which may help to bring in income. Visual or acoustic scarers should be deployed to protect grazing pasture from damage during the summer months. Out of season shooting to augment this scaring could be carried out under the general licence for the purpose of preventing damage to the grazing pasture and possibly the fishery. The summering population could be further managed by fencing the lake edge and planting unpalatable barrier vegetation (which would double as nesting cover for other waterfowl species). If this was insufficient to reduce numbers of breeding birds, the landowner could (under a relevant general licence) treat eggs to prevent hatching. Culling is unlikely to be immediately effective in this case unless the exercise can be carried out both on the estate lake and the nearby reservoir. A cull on the estate lake would simply make breeding territories available to non-breeding birds which would rapidly move in, necessitating repeat culls over a number of years.

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Example 3

A farm adjacent to a large reservoir, part of which is a designated nature reserve. A resident population of 600 Canada geese with 30 breeding pairs occupy the reservoir all year round. The birds fly out from the reservoir to feed, damaging newly sprouted winter cereals and other crops.

Suggested IMS:

In these circumstances, the attitude of the reservoir managers and others with interests in managing the nature reserve (e.g. local wildlife trusts etc.) are crucial. If the owners of the reservoir are opposed to any control action designed to reduce the population, then the farmer is limited to shooting in season and under a general licence (to prevent damage to crops), scaring, or changing his cropping patterns to minimise damage. Considerable effort and expense may be required to sustain the scaring effort needed over the period necessary to protect his crop. Acoustic and visual scarers should be deployed and moved at regular intervals to maximise their effect. Regular shooting of the Canada geese should aid the effectiveness of the scaring, and may encourage the birds to feed elsewhere, especially if there are alternative feeding sites nearby. Population management (under the general licence for the purpose of preventing serious damage to crops), either in the form of egg control, or a flightless cull, would only be possible with the co-operation of the owners of the reservoir.

Further Information

In England, further advice on dealing with Canada goose problems, as well as problems caused by other birds and mammals can be obtained by contacting the Department for Environment, Food and Rural Affairs (Defra) Wildlife Management Team at:

Address: Wildlife Administration Unit, Defra, Burghill Road, Westbury-on-Trym, Bristol, BS10 6NJ

Telephone: 0845 601 4523 (local rate)

Fax: 0845 601 3438 (local rate)

E-mail: enquiries.southwest@defra.gsi.gov.uk

The general licences and a range of leaflets on wildlife topics, are available online at:

<http://www.defra.gov.uk/wildlife-countryside/vertebrates>

Licences for the control of Canada geese for conservation purposes are issued by English Nature. Further details can be obtained from English Nature local offices, details of which can be found in the telephone directory, or from their Headquarters:

Address: English Nature Licensing Section, Northminster House, Peterborough, PE1 1UA

Telephone: 01733 455000

Fax: 01733 568834

E-mail: enquiries@english-nature.org.uk

Licences allowing the release of Canada geese into the wild are issued by Defra's Non-native Regulation Team. Further details can be obtained:

Address: Non-native Licensing Team, Ashdown House, 123 Victoria Street, London, SW1E 6DE.

Telephone: 0207 082 8122

Fax: 0207 082 8123

Website:

<http://www.defra.gov.uk/environment/qm/nonnav/index.htm>

Advice on Biology and Management

Defra RDS National Wildlife Management Team (address above).

Central Science Laboratory, Sand Hutton, York, YO41 1LZ.

The Wildfowl and Wetlands Trust, Slimbridge, Gloucestershire, GL2 7BT.

Advice on Control Techniques**Scaring techniques**

Defra RDS National Wildlife Management Team (address above)

National Farmers Union, Agriculture House, 164 Shaftesbury Avenue, London, WC2H 8HL. Tel: 0171 331 7200

Civil Aviation Authority, CAA House, 45 – 59 Kingsway, London, WC2B 6TE. Tel. 020 7379 7311

The British Association for Shooting and Conservation (BASC), Marford Mill, Rossett, Wrexham, LL12 0HL. Tel: 01244 573000. E-mail: enq@basc.demon.co.uk

BASC's fact sheet 'Canada geese: A guide to legal control measures' is available from the BASC website:

<http://www.basc.org.uk/>

Advice on Shooting and Connected Issues

The British Association for Shooting and Conservation (address above).

Advice on carcass disposal and acoustic scarers

Local Authority - (your Local Authorities address can be found in the telephone directory).

Further reading

- Allan J.R. Kirby J.S. & Feare C.J. (1995) The biology of Canada geese (*Branta canadensis*) in relation to the management of feral populations. *Wildlife Biology* Vol. 1 p 129-143.

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- Department of the Environment Transport and the Regions (1998) **Population Dynamics of Canada Geese in Great Britain and Implications for Future Management**. Report by Wildfowl and Wetlands Trust and British Trust for Ornithology.
- Department of the Environment Transport and the Regions (1998) **Canada Goose Research Project: Control Measures and Study of Related Canada Goose Problems**.
- Wandsworth Borough Council (undated) **London Lakes Project Overview Document**. Obtainable from Wandsworth BC price £15
- National Farmers Union: **Leaflet; code of practice on bird scaring**

This leaflet was produced by the Defra Rural Development Service (RDS) and the Central Science Laboratory (CSL).

Photograph courtesy of Anthony O'Connor, Defra RDS.

A full list of Rural Development Service publications can be viewed and downloaded from <http://www.defra.gov.uk/corporate/rds/publications/default.htm>.

Footnote¹: Amended in England and Wales through the Countryside and Rights of Way Act 2000, the Wildlife and Countryside (England and Wales) (Amendment) Regulations 2004, and in Scotland through the Nature Conservation (Scotland) Act 2004.

The Management of Problems caused by Canada Geese - A Guide to Best Practice

Author: *Dr John Allan, Central Science Laboratory*

The production of this paper was funded by the Department of Environment Transport and the Regions. It forms the basis of national guidelines for the management of Canada Geese which are due to be published shortly after this conference. I am most grateful to the DETR for permission to reproduce this paper in the conference proceedings.

Introduction

The Canada Goose population in Britain numbers over 63,000 birds and is still increasing. The geese live in local populations, usually of up to a few hundred birds, which remain around one or two water bodies that offer suitable habitats for breeding, roosting etc. Because the geese have relatively few predators, and can produce four or five young per year, numbers at particular sites can grow very rapidly and significant problems may occur.

Any management techniques used to control the problems caused by Canada Geese must be legal (Canada Geese are protected under both British and European legislation) and should take account of the fact that Canada Geese are a popular species with many members of the general public.

This paper aims to provide land managers with the information that they need to manage difficulties caused by Canada Geese in a way that is effective, legal and sensitive to public opinion.

The Biology and Behaviour of Canada Geese

In order to develop an effective management strategy for any nuisance wildlife, it is necessary to understand enough about the biology of the species and the local population involved to be able to predict the outcome of whichever management techniques are chosen. This section gives a brief point by point overview of the biology of Canada Geese in Britain insofar as it affects the management of the species.

1.1 Breeding

A single clutch of around 6 eggs is laid in early April each year.

Incubation, solely by the female, takes 28-30 days.

Nests are usually close to water bodies, often on islands which provide some protection from predators such as foxes, dogs or mink.

The adult geese defend a small territory around the nest, but are willing to tolerate other pairs nesting nearby, so large colonies can build up on sites with enough nesting territories and adequate food supplies.

The geese are aggressive in defence of their nests and will attack Canada Geese, other waterfowl, and even humans who approach too closely.

1.2 Fledging and the moult

The hatched young are flightless for 10 weeks and are protected by the adults on the water at the breeding site.

Mortality rates are highest for very young fledglings, but become little different from adults once the young are more than a few weeks old.

The adult birds moult around the end of June and are unable to fly for a 3-4 week period.

During the moult, both adult and juvenile birds must feed from the water or walk to find food.

The amount of suitable food available at a site during this period may be important in governing the number of breeding pairs that it can support.

Some birds, which have either not attempted to breed or which have failed to raise a brood, undertake longer journeys to find the best sites to moult. Some birds from Yorkshire and the West Midlands fly as far as Scotland to find suitable moulting sites.

1.3 Dispersal

The geese normally remain close to the site where they hatched, and once young birds mature they may wait several years for a breeding territory to become available.

Large flocks of non breeding adults may thus build up at certain sites.

Most Canada Geese remain faithful to their home area for life, even if apparently suitable water bodies with no Canada Geese present are available nearby. Females are generally more site faithful than males

Small numbers (usually of young birds) abandon their home area either to join other groups or to establish new colonies.

2.2 Fouling with droppings

Because of the low nutrient value of their food, Canada Geese need to eat large quantities of vegetation.

When feeding they may produce droppings at a rate of one every 6 minutes.

The droppings contain bacteria that may be harmful if swallowed and they also make grassed areas unattractive and paths slippery.

If the droppings are passed into water bodies they may cause increased nutrient loadings leading to possible toxic algal blooms and low oxygen levels in the water.

2.3 Damage to wildlife habitat

Canada Geese can damage the habitat of other wildlife, for example by grazing or trampling nesting sites of other bird species.

Destruction of waterside habitat, such as reed beds, by Canada Geese can be a significant problem, leading to erosion of river banks in some cases.

2.4 Excluding other wildlife

There is little hard evidence that Canada Geese cause significant problems by competing directly with other wildlife.

Aggressive confrontations do occur, and there is some evidence of other large waterfowl being excluded by, or excluding, Canada Geese from a preferred breeding site.

Such interactions are rare, however, and are thought to have little effect on the overall populations of other native waterfowl.

2.5 Birdstrike hazards to aircraft

The large size of Canada Geese makes a collision with an aircraft a particularly hazardous event.

Recently, a United States Air Force AWACS aircraft (a large four-engined jet) crashed following a collision with a flock of Canada Geese, killing all on board.

The aviation industry continues to express concern about the increasing numbers of Canada Geese on water bodies near aerodromes.

1.4 Wintering

Unlike their North American ancestors, Canada Geese in Britain are mostly non-migratory, moving only short distances between breeding and wintering sites within their local area.

Birds may fly out from the water bodies where they roost to regular winter feeding sites such as waterside grazing pasture, amenity grassland etc. They may also move around their home range taking advantage of feeding opportunities such as sprouting winter cereals or root crops as they become available.

1.5 Causes of mortality

Adult Canada Geese have few natural predators in Britain, and most of the known causes of recorded mortality are associated with man's activities. Annual mortality is estimated at between 10 and 20% of the whole population. Juvenile birds have the same level of mortality as adults once they reach their first moult.

The causes of death are:

- 67.2% shooting
- 4.3% hit power lines
- 5.5% redation
- 23% unknown.

There is little evidence that natural factors, which become more severe as numbers of birds increase, such as limited food availability, act to control Canada Goose numbers.

Low annual mortality and high reproductive rates give the national population the scope to increase in size for the foreseeable future.

2. Problems Caused By Canada Geese

2.1 Grazing and trampling

Canada Geese are vegetarians, grazing on both land and water plants.

Damage to amenity grassland in public parks, where the geese may occupy regular feeding and roosting sites all year round can be severe.

Unightly and un-hygenic areas of mud and droppings which are expensive to reinstate frequently occur.

The geese may trample as well as graze pasture and crops.

Planning applications involving the creation of water bodies suitable for Canada Geese close to aerodromes may be refused on the grounds of flight safety.

3. Management Techniques

3.1 The protected status of Canada Geese.

The Canada Goose, like all other birds in Britain, is protected under the EC Wild Birds Directive implemented in the United Kingdom through the Wildlife and Countryside Act (1981). This makes it an offence to capture, kill or injure Canada Geese, to damage their nests or eggs, or to disturb them on a breeding site. Any control technique which involves breaking the protected status of the Geese requires a licence from the appropriate government authority (see appendix 1).

Canada Geese can be legally shot by authorised persons or trapped by approved methods in the open season (between September 1st and January 31st, or February 20th on the foreshore). The use of shooting or trapping by approved methods to control Canada Geese during the open season does not, therefore, require a licence, but care should be taken to ensure that other regulations concerning firearms safety, capture methods etc. are adhered to. If in doubt, advice can be sought from the organisations listed in appendix 1.

3.2 Integrated Management Strategies (IMS) For Canada Geese

Experience has shown that it is unlikely that a single management technique will be fully effective in controlling a problem caused by Canada Geese. For example:

- Fencing an area to keep birds off will simply cause them to move to an alternative site close by and continue to cause damage.
- Preventing reproduction by treating eggs to stop hatching will not reduce the population of adults (and hence the levels of damage or nuisance) for many years.
- Culling the adult population at a site may simply allow non breeding adults from nearby waters to move in to vacated breeding territories.

In those cases where effective management of the problem has been achieved, Integrated Management Strategies (IMS) which combine a suite of techniques have invariably been employed. One of the most effective Canada Goose management programmes to date involved the development of an IMS that combined reduction of adult numbers, reproductive control and fencing to exclude birds in an IMS carried out by Wandsworth Borough Council as part of a larger programme to improve the quality of its urban park lakes.

3.3 The Scale Of Management Required For A Successful IMS

Although the damage or nuisance caused by a group of Canada Geese may be occurring at only one site, it is important to remember that the population of geese to which the birds belong may be spread over a number of nearby waters. When developing an IMS for a particular situation, it will often be necessary to manage birds away from the site where the problem actually occurs. This is especially important if population reduction is to be included in the IMS. For example, if scaring or habitat management proved insufficient to control a problem at a wintering site, and population reduction by egg control or culling became necessary, the breeding and moulting sites used by the wintering birds would need to be identified and the co-operation of the landowners obtained before this strategy could be implemented.

3.4 Available techniques for the control of problems caused by Canada Geese

The choice of which techniques to combine into an IMS will depend upon the type of damage that is occurring, the type of control that is needed to reduce the damage to acceptable levels, and the biology and distribution of the birds involved. A series of examples are given at the end of this section.

The techniques available fall into two broad categories; the control of behaviour, by scaring or excluding the birds from the site in question, and the control of numbers, by manipulating the breeding rate or rate of mortality of adult birds. Some of these techniques, especially those involving the manipulation of bird numbers, will require a licence (see appendix 1). Where a licence is needed this is indicated below.

3.4.1 Behaviour modification (scaring, exclusion, repellent chemicals)

Scaring techniques

a) Visual.

Ground based scarers

Most visual scarers rely on the natural fear of the unfamiliar of wild animals. Scarecrows of various designs, flags and flapping tapes have all been employed to deter geese from areas such as sprouting crops. However, even migratory goose species learn to ignore these deterrents and Canada Geese, which often live close to man, are used to man made items. Scarecrows, whether human or animal effigies, windmills, rotating mirrors etc., should be placed in the centre of the area where problems are occurring and should be moved every 2 or 3 days to maximise their effect. Flags or flutter tape should be attached to upright poles at regular intervals across the affected area. In

general, the closer the spacing of the flags the greater the deterrent effect is likely to be. Visual scarers may be effective for short term deterrence of Canada Geese from sensitive areas, especially if alternative sites are available nearby.

Kites and balloons

Other visual scaring techniques include kites and balloons, often painted with large eyes or made in the shape of predatory birds. A threat from above may be more intimidating for birds which may naturally be attacked by birds of prey, and a single balloon may deter birds from a larger area than a ground based scarer. The devices should be set to fly above the problem area during normal wind conditions. They may need to be re-set if wind direction changes and may not fly well in heavy rain or very strong winds. As with ground based scarers, birds will eventually learn to ignore them and they are best used as short term deterrents when alternative sites are available for the birds to move to.

Problems with visual scarers

Although effective in the short term, visual scarers have some drawbacks, particularly in situations such as public parks. The scarers may be unattractive and interfere with recreational use of areas and could be subject to theft. They also require maintenance and some need to be moved on a regular basis to maximise their effect. Visual scarers are particularly appropriate for use to protect agricultural crops where the geese need to be excluded for a limited period of time such as during sowing or prior to harvest.

b) Acoustic

Acoustic scarers, from the commonly used gas cannon through recorded bird calls to complex solar powered artificial sound generators, are all marketed as being effective in deterring Canada Geese. Most will deter the birds from relatively small areas providing that there are alternative areas for them to use for roosting or feeding nearby. Like visual scarers, the birds will eventually learn that they offer no threat, although their effectiveness can be prolonged by moving the scarers every two or three days. Acoustic scarers are often hidden (by deploying them at the edge of a field or behind hay bales or other screens) so that the birds cannot see where the sound is coming from. This is thought to prolong the time before the birds realise that the sound represents no threat, but there is little scientific evidence to support this assertion.

Problems with acoustic scarers

As with visual scarers, acoustic scarers may be unsuitable for use in areas frequented by the public due to the sudden loud noises involved, and the relatively expensive equipment may be subject to theft or vandalism. These systems are more likely to be of use to protect agricultural crops or to deter birds from islands or similar remote areas.

c) Combined visual/acoustic

Some scaring systems combine visual and acoustic stimuli in order to enhance the deterrent effect. Such systems vary from gas cannons which shoot a projectile up a pole when the cannon goes off (in order to simulate a shot bird falling to the ground) to an inflatable rubber man which emerges from a box accompanied by a loud klaxon. The combination of visual and acoustic stimuli may lengthen the time before the birds habituate to the scarers, and they will be more effective if moved every 2 or 3 days. All of these systems have the same drawbacks as visual or acoustic scarers alone and are suitable for use in similar situations.

d) Human operated bird control

For many bird species the most effective bird scarer is a human being, armed either with a harmless scaring device such as a flag or firework, or with a shotgun. Where Canada Geese are regularly shot, the simple presence of a human may be sufficient to deter birds from an area. In most situations, however, Canada Geese show little fear of man, particularly where they are used to being fed by the public. Even if the geese can be trained to fear humans, the deterrent will only be effective if it is continuously deployed whenever the geese are present. The resulting high cost of human operated scaring of Canada Geese, by whatever method, means that it is usually only an effective option when the damage caused is extremely expensive, or where the risks to health and safety are extreme (e.g. in preventing birdstrikes to aircraft).

Shooting to support scaring

It is widely believed that periodic shooting of a small number of birds helps to make them more wary and thus makes acoustic and visual scarers more effective. Whilst there is little scientific evidence to support this theory, this may well be the case, and licences to shoot limited numbers of birds to support scaring outside the open season may be issued in certain circumstances.

Exclusion

Where scaring of Canada Geese is not desirable, it may be possible to exclude the birds from sensitive areas by physically preventing them from

gaining access. As with scaring techniques, exclusion is likely to be most effective if alternative sites are available for the birds to move to. These techniques may create some difficulties as they affect other waterfowl species as well as Canada Geese. The erection of fences along a lakeside may also have implications for public safety if someone were to fall into the water and be unable to get out easily.

Fencing

Perhaps the most obvious way to exclude Canada Geese is to fence sensitive areas to prevent them gaining access. Despite the fact that the geese can fly, even low fences of around 1m high can be effective in excluding them from some areas as they prefer to walk to their feeding and roosting sites if possible, often landing and taking off from water. Thus, fencing the edge of a lake may be sufficient to cause the geese to move elsewhere if they are unable to walk easily out of the water. Canada Geese dislike enclosed areas where they cannot easily escape from predators. Barriers that divide fields into smaller units may therefore help to discourage the birds from using the site concerned.

Fences have also been successfully used to exclude Canada Geese from breeding and roosting sites, especially where alternative sites were available nearby. Fencing the perimeter of park lakes is not necessarily an expensive option because a simple post and chicken wire fence will suffice if properly erected, but a more decorative and permanent structure may involve a significant cost. Fencing may be a particularly effective option at sites used by moulting Canada Geese because if they are prevented from walking out of the water whilst they cannot fly they will not be able to access the feeding areas nearby. Care should be taken, however, to ensure that if moulting adults or newly hatched young are found at a fenced site, they do not starve through lack of access to grazing areas.

Barrier planting, marginal vegetation, trees

An alternative to fencing lake edges, or placing barrier fencing around grazed areas, is to modify the vegetation in the areas suffering damage by Canada Geese. Establishing areas of dense vegetation along the shores of water bodies (possibly concealing a cheaper fence structure) or breaking up large grass areas with planting which restricts the bird's view of the water (and hence reduces its feeling of safety) have all proved effective in certain circumstances. If Canada Geese do move out to feed in small areas flanked by hedges and trees, they prefer a shallow climb out angle to aid their escape. Thus, the taller the surrounding vegetation relative to the size of the field or other grazed area the less likely the geese are to use it.

Chemical repellents

A number of products are currently under development which are designed to harmlessly repel wildlife from areas where they are not wanted. Some of these products are currently on sale in the USA and have met with mixed success. At present there is no repellent chemical available in the UK that is approved for use and is effective against Canada Geese. Further field testing will be required before a proper evaluation of available repellent chemicals can be made in the future.

Habitat management

It may be possible to permanently alter an area where Canada Geese are causing problems to make the site unattractive to them. Whilst the features that make a water suitable for Canada Geese are not fully understood, enough is known about the biology of the birds to allow a number of suggestions for habitat modifications to be made.

Landscaping: bank steepening and island removal

As with fencing, making it more difficult for Canada Geese to walk out of water bodies onto feeding areas by steepening banks may encourage the birds to move elsewhere. Avoiding shallow marginal areas which support water plants will also restrict the food supply for the geese, but this may adversely affect other waterfowl and/or damage the rest of the aquatic habitat. Safety concerns about having deep water and steep banks in public areas would also need to be considered. Because Canada Geese prefer to breed on islands, the complete removal of an island could be considered if fencing proved ineffective in discouraging the birds. Low lying islands could be effectively removed by raising water levels in some circumstances. As with all other exclusion or habitat modification techniques, the effect on other wildlife would need to be considered before embarking on such a project.

Reducing available foraging areas adjacent to water bodies by changing ground cover.

It may be possible to reduce or eliminate Canada Goose damage to amenity areas by changing the ground cover planting to species that are not palatable to the geese. Ground cover plants with tough leaves, such as Ivy, and many shrub species are not readily eaten by Canada Geese and planting the fringes of lakes with a combination of barrier planting and unpalatable ground cover may reduce the feeding opportunities to the point where the geese move elsewhere.

Changing cropping patterns

Where agricultural damage is occurring, it may be possible to change the crops being grown to those less susceptible to damage by Canada Geese, or

to move to crops which are most vulnerable when the geese are elsewhere. This would obviously require a balance to be struck between the economics of moving to a different crop compared to the cost of either tolerating or controlling the damage being suffered. Further advice can be obtained from the local office of the Farming and Rural Conservation Agency.

3.4.2 Population management

In situations where serious problems are being encountered and where habitat management, scaring or exclusion techniques are inappropriate or have been tried and have failed, it may be necessary to reduce the scale of the problem by reducing the size of the goose population at a particular site. There are a number of techniques that can be used for population management but all require a licence from the appropriate authority, except for shooting in season.

Relocation

The initial response to the first problems caused by Canada Geese in the 1950's and 60's was to capture the birds during the flightless period of the moult and to move them to other waters where there were no Canada Geese at the time. Many of the relocated birds simply returned to their original home, whilst those that did remain on the new site began to reproduce rapidly in the new habitat and problems soon began to occur at these sites as well. It is thought that these reintroductions played a significant part in the sudden rapid expansion of the Canada Goose population which is continuing today. Because further relocations are likely to speed the geographic spread of the species, and may also speed up population growth in newly colonised areas, it is unlikely that licences will be granted to relocate Canada Geese in the foreseeable future. It is illegal, under schedule 9 of the Wildlife and countryside Act 1981, to release Canada Geese into the wild without a licence.

Shooting in season

Canada geese may be legally shot during the open season (1st. September to 31st. January, or 20th. February on the foreshore) by authorised persons (i.e. persons acting with the authority of the landowners and the owners of the shooting rights to the land involved). Because they are frequently quite tame, Canada Geese are not regarded as a very 'sporting shot' by many wildfowlers and the numbers shot each year are relatively small. If the hunting pressure on Canada Geese were to be increased they may become more wary and hence offer a greater challenge to the hunter. However, it is unlikely that winter shooting alone could reduce a large population of, for example, 500 birds by a significant amount in a single season as the increasing wariness of the birds would make the shooting of large numbers in a single session

increasingly difficult, and the birds might simply desert the site during the winter open season, returning to breed, and hence cause more damage, in the spring. Intensive shooting to reduce population size has additional drawbacks in that it will disturb other waterfowl, and may not be possible in public parks etc. for safety and public relations reasons.

Egg control (requires a licence)

Treating the eggs of Canada Geese to prevent hatching is one of the most commonly used licensed population control techniques. It is easily carried out and requires effort annually over a limited period. It is also generally regarded by the public as an acceptable means of population control. Eggs may be removed from nests once the clutch is complete, but there is a possibility that the bird will lay a second clutch. To avoid this, eggs may be treated to prevent hatching or replaced with dummy eggs so that the goose incubates the eggs as normal and then abandons the clutch when they fail to hatch. There are a variety of treatment methods that may be licensed:

- **Egg pricking.** This involves piercing the egg with a pin or small nail and moving this rapidly around inside the egg to kill the embryo before returning the egg to the nest. Egg pricking must be done carefully as if the bird detects that the eggs are damaged she may desert the nest and lay another clutch.
- **Boiling.** Eggs may be boiled to kill the embryo and returned to the nest.
- **Egg oiling.** Eggs may be coated with mineral oil by rolling them in a small quantity of mineral oil carried in a polythene bag. The mineral oil sold as liquid paraffin (BP) in chemists is harmless to the birds - **note this is not paraffin fuel as used in stoves etc.** The oil blocks the pores in the eggshell and starves the embryo of oxygen. This technique is easy to carry out, 100% effective in preventing hatching and does not adversely affect the sitting bird.

Providing that the treatment is applied early in the incubation cycle, ideally immediately after the clutch is complete, all of these techniques are humane and effective in preventing additional young birds being recruited to the population. However, because of the low mortality rate of the adults, it may need 80% of all of the eggs on a site to be treated for in excess of 8 years before egg control alone will begin to show a reduction in population size. If nests are hard to find or manpower resources limited, egg control alone is likely only to hold the problem at its present level rather than to reduce it significantly.

Control of adults (requires a licence)

The quickest way to achieve a large scale reduction in the number of Canada Geese at a site is by the culling of fully grown birds. The effect is immediate

and, if the birds can be captured during the moult, most, or all, of a population can be removed. The principal disadvantage of this technique is that it often meets with a strong adverse reaction from the public. The techniques require some specialist knowledge to be used effectively and considerable manpower is needed if a large scale cull is to be carried out effectively and humanely.

The most common way of removing birds is by capture during the moult. Canada Geese moult all of their flight feathers simultaneously, and, for a period of four to six weeks around the beginning of July, are unable to fly. The birds form moulting flocks, remaining on the water for most of the time to reduce the risk of predation during this vulnerable period. A number of small boats or canoes can be used to herd the birds towards the bank where a funnel shaped enclosure made of chicken wire supported by fencing stakes is erected. The funnel leads into a catching pen with a removable door. The birds are forced up onto the bank and into the mouth of the funnel. The catching party then drive the birds into the funnel and, eventually, into the pen and the door is closed. This technique requires some experience if it is to be carried out successfully, and expert advice should be sought. Smaller numbers of birds may be captured using nets or similar devices, providing any method used does not contravene Section 5 of the Wildlife and Countryside Act 1981, again expert assistance should be employed.

Once captured, it is necessary to humanely despatch the birds. A number of techniques are allowed by law, but it is best to seek professional advice if a large number of birds need to be despatched. Employing a veterinary surgeon to despatch the birds by lethal injection or to oversee the whole operation may be advisable to allay the concerns of the general public.

Before embarking on the large scale destruction of geese it is important to be sure that the birds that you are removing are actually the ones that are causing the problem. For example, birds causing agricultural damage at a wintering site may moult at a site a considerable distance away. It should also be noted that at long established breeding sites there may be a surplus of birds waiting to occupy breeding territories, but which moult elsewhere. Thus, a cull of breeding birds may simply create vacant territories for other birds to move into and repeat culls may be necessary for a number of years before the problem is finally brought under control.

3.5 Examples Of Possible Integrated Management Strategies For Problems Caused By Canada Geese

The choice of which techniques to use in an IMS will depend on a number of factors specific to the site in question; these include the biology and movement patterns of the birds involved, the severity of the problem, the

timescale in which the problem needs to be resolved, possible adverse public reaction, cost and manpower constraints, and the need to obtain licences for some techniques. Examples of IMS that might be developed for typical situations follow, if in doubt, the landowner or manager should take expert advice on the development of an IMS suitable for his or her particular circumstances.

Example 1

A public park with an ornamental lake and lawns. A resident and growing population of 200 Canada Geese with 15 pairs breeding on an island in the lake. Birds range widely over the park, damaging lawns and bankside vegetation and leaving large quantities of droppings which are fouling grassed areas and paths.

Suggested IMS:

The lake shore and island should be fenced to prevent the birds walking out to feed. If other waterfowl are present, a small gap at the bottom of the fence will allow them to move in and out of the water whilst restricting the movement of the geese. Consideration should be given to establishing bankside vegetation that is resistant to damage by the geese (the presence of the fence will aid establishment or reinstatement of damaged areas). Flutter tape or other scarers may be deployed to keep the geese off badly damaged areas. In order to prevent further population increase, a licence should be sought from the Department of the Environment, Transport and the Regions to treat the eggs of any birds that breed on the island despite the fencing. The licence could be issued on the grounds of public health and safety due to the hazards posed by the droppings in public areas. These techniques should be monitored for at least two years in order to assess their effectiveness. If problems persist, a licensed cull of birds may be necessary, with sufficient birds being captured during the moult to reduce the population to the desired level, followed by on going egg control to keep the population under control.

Example 2.

A kept country estate with a large lake which is used as a fishery and a waterfowl shoot in winter. A summer population of 200 Canada Geese with 40 breeding pairs along the lake shore. Non breeding birds moult at a large reservoir nearby and additional birds from other breeding sites frequent the water in winter, swelling the population to 400 birds. The geese are damaging grazing pasture and destroying bankside vegetation which is used as nesting habitat by other waterfowl, their droppings are thought to be polluting the water and killing the fish.

Suggested IMS:

Increasing the in-season shooting pressure on the geese may be sufficient to encourage the wintering population to move to the other waters nearby. The estate could consider organised goose shoots which may help to bring in income. This would need to be balanced against the disturbance caused to more 'desirable' waterfowl species. Visual or acoustic scarers should be deployed to protect grazing pasture from damage during the summer months and a licence to allow out of season shooting to augment this scaring could be applied for from the local Ministry of Agriculture Fisheries and Food office on the grounds that the birds are damaging grazing pasture, wildlife habitat and possibly fisheries. The summering population could be further managed by fencing the lake edge and planting unpalatable barrier vegetation (which would double as nesting cover for other waterfowl species). If this was insufficient to reduce numbers of breeding birds the landowner could apply for a licence from MAFF to treat eggs to prevent hatching. Culling is unlikely to be immediately effective in this case unless the exercise can be carried out both on the estate lake and the nearby reservoir. A cull on the estate lake would simply make breeding territories available to non breeding birds which would rapidly move in, necessitating repeat culls over a number of years.

Example 3.

A farm adjacent to a large reservoir, part of which is a designated nature reserve. A resident population of 600 Canada Geese with 30 breeding pairs occupy the reservoir all year round. The birds fly out from the reservoir to feed, damaging newly sprouted winter cereals and other crops.

Suggested IMS:

The farmer has relatively few options other than shooting in season, scaring (possibly with out of season shooting in support) or changing his cropping patterns to minimise damage. In these circumstances, the attitude of the reservoir managers and others with interests in managing the nature reserve (e.g. local naturalists trusts etc.) are crucial. If the owners of the reservoir are opposed to any control action designed to reduce the population, then the farmer is limited to the techniques described above and may need to go to considerable effort and expense to sustain the scaring effort needed over the period necessary to protect his crop. Acoustic and visual scarers should be deployed and moved at regular intervals to maximise their effect. Regular shooting during the open season may encourage the birds to feed elsewhere, especially if there are alternative feeding sites nearby. Population management, either in the form of egg control or culling of adult birds would only be possible with the co-operation of the owners of the reservoir.

5 Further Reading

ADAS 1987: **Bird Scaring - Leaflet P9003** MAFF Publications

Allan J.R. Kirby J.S. & Feare C.J. (1995) **The biology of Canada geese (*Branta canadensis*) in relation to the management of feral populations.** Wildlife Biology Vol. 1 p 129-143.

Department of the Environment Transport and the Regions (1998) **Population Dynamics of Canada Geese in Great Britain and Implications for Future Management.** Report by wildfowl and Wetlands Trust and British Trust for Ornithology.

Department of the Environment Transport and the Regions (1998) **Canada Goose Research Project: Control Measures and Study of Related Canada Goose Problems.**

Department Of The Environment (1994) **Canada Geese - A Guide To Legal Control Methods.** National Canada Goose Working Group.

Wandsworth Borough Council (undated) **London Lakes Project Overview Document.** Obtainable from Wandsworth BC price £15

Appendix 1

How to apply for a licence to control Canada Geese

All management of Canada Goose problems must be undertaken within the law. Some techniques, such as scaring birds away (but not from a nesting area) can be undertaken freely, others, such as shooting birds out of season or preventing eggs from hatching are illegal unless a special licence is obtained from the government (usually MAFF or DETR). The law requires that the licensing authority is satisfied that there is a significant problem and that there is no other satisfactory solution before it can issue a licence. Licences can be issued only for the following situations:

- To prevent serious damage to livestock, foodstuffs for livestock, crops, vegetables, fruit, growing timber or fisheries.
- To preserve public health or public or air safety
- To conserve wild birds or to protect any collection of wild birds.

Applications for a licence to control agricultural problems should be addressed to the nearest MAFF office (address in the telephone directory).

Applications for all other purposes should be directed to:

In England:

Department of Environment Transport and the Regions
Rm. 902c

Tollgate House
Houlton St.
Bristol
BS2 9DJ

Tel: 0117 9878903

In Scotland:

Scottish Office, Agriculture, Environment & Fisheries Department (SOAFED)
Pentland House
47 Robb's Loan
Edinburgh
EH14 1TY

Tel: 0131 2446548

In Wales:

Welsh Office
Cathays Park
Cardiff
CF1 3NQ
Tel: 01222 825203

Applicants should expect to complete a pro forma application form or send a letter detailing the type of damage being suffered and what measures have already been tried to control the problem. For applications to MAFF, a site visit by a MAFF representative may also be required to assess the nature and severity of the difficulties being encountered. Licences are normally restricted to killing a small number of birds to aid scaring or for treating a limited number of eggs to prevent hatching. Licences for larger scale culls of birds are issued only in exceptional cases and after very serious consideration. All applicants are encouraged to use the licensing scheme as part of a wider management plan to control the number of geese present.

CONTACT DETAILS

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Examples of Good Practice in the UK

Goose Management in South West London

Wandsworth Borough Council (WBC) was awarded funding by the European Commission to restore (improve the water quality, landscaping and decrease bankside erosion) three urban park lakes in Wandsworth (Battersea Park Lake, King George's Park Lake and Tooting Common Lake): The London Lakes Project. The project was divided into six distinct Phases with phase 3 focussing on Waterbird Monitoring and Management. Earlier studies of the use of the sites by waterfowl had confirmed the council's view that Canada Geese potentially contributed to the problem of eutrophication by depositing relative large amounts of phosphorous rich faeces into the lakes. The same studies indicated that Canada Geese spend more time on the lake banks and on the amenity grassland beside the lake, relative to other native wildfowl species, thereby contributing to the problem of bankside erosion. Similarly, other feral and exotic wildfowl, in particular domestic X Greylag Geese and Muscovy, were seen to be in conflict with the projects objectives. These domestic crosses were largely sedentary at Battersea Park and so, although not as numerous as Canada Geese, the grazing and trampling pressure exerted on the banks was continuous throughout the year. In order to meet the water quality and landscaping objectives of the project it was considered necessary by the project partners to reduce the number of Canada Geese and other feral and exotic waterfowl using Battersea Park Lake.

Initially, a survey was undertaken of Canada Geese by the commercial arm of the Wildlife & Wetlands Trust and their movements were mapped. WBC went on to develop an integrated management strategy for their parks. Their strategy involved both site-based and population-based control measures (eggs were treated once a fortnight throughout the breeding season, every year), as well as a range of other management techniques

The measures taken were very effective and other waterfowl benefitted greatly from the changes. More species began to regularly use the ponds, and many species also increased in numbers. This is probably partly because the goose population before control measures began had been high.

Venue	Number of Canada Geese in 1995	Numbers after cull	Numbers in 2015
Battersea Park	124	68	8
Tooting Common	32	N/A	2
Wandsworth Common	62	N/A	12

Wandsworth confirmed there had been a steady decline in numbers year on year from 1995 to 2005 as a result of the suite of measures they put in place, and that the numbers had remained stable since 2005.

The reduction in geese numbers also assisted with improving the water quality. Those water bodies now support more invertebrate species and are better able to support aquatic plants, which over time will further improve the water quality and dissolved oxygen levels.

Goose Management in the Lake District

Management of Canada Geese has been carried out on Windermere in some form or other for nearly 20 years. In 2007 a group of science and conservation organisations and major landowners from around the lake formed the Windermere Geese Management Group. It was set up to tackle the problems resulting from the large increase in numbers.

The number of geese in the Lake District National Park varies depending on the time of year. There is a population of resident birds and their numbers are added to in winter and summer by additional birds looking to avoid hard winter conditions elsewhere or find summer grazing. In summer 2011 over 1100 birds were counted on Lake Windermere.

The group have tried temporary fencing, permanent fencing, mechanical scarers and egg oiling to prevent eggs hatching. Despite all of this there are still large numbers of Canada geese causing problems.

As an invasive non-native species, it is recognised that Canadian Geese have a detrimental impact on the area including:

- Damage to shoreline habitats
- Displacement of native species
- Damage to farm grazing and crop land
- Pollution of public and private recreational land
- Public health concerns from pathogens, bacteria and parasites
- Contribute phosphorus to the lake, and their grazing may contribute to the damage and loss of reed beds.

As a result, In March 2012 the Windermere Geese Management Group considered a cull of Canada Geese on Windermere. However the group faced growing opposition to the planned cull from members of the public and organisations including the RSPCA, and decided to defer the proposed cull in order to meet with those organisations and individuals to discuss alternative

approaches to management, and to gather more evidence on the adverse impact of geese on land management, wildlife and visitor enjoyment. To date no cull has taken place and non-lethal control measures continue to be used.

Goose Management in Scotland

Historically, wild geese have formed an important part of Scotland's natural heritage. Following a period of decline in the 1950s-70s, goose numbers have increased in Scotland and in recent decades the recovery of certain goose populations has caused agricultural damage to crops in some areas. As a result many farmers and crofters affected by large numbers of grazing geese regard them as agricultural pests.

A national policy framework for goose management has been in place in Scotland since 2000 to help balance agricultural and conservation interests, and a national co-ordinating body, the National Goose Management Review Group (NGMRG) has been in place since May 2000 to implement the national policy framework and to advise Scottish Ministers on goose management in Scotland.

The NGMRG is guided in its deliberations by three fundamental objectives which are at the heart of the national policy framework. These core objectives are to:

- Meet the UK's nature conservation obligations for geese, within the context of wider biodiversity objectives
- Minimise economic losses experienced by farmers and crofters as a result of the presence of geese
- Maximise the value for money of public expenditure

In general terms, the national policy framework has delivered what it set out to do, and perhaps more. Its approach to national and local partnership, the integration of the needs of conservation and agriculture, an evidence base of sound science and the growing recognition of the wider public benefits all contribute to the delivery of the objectives and are all direct consequences of the policy framework.

There are seven Local Goose Management Groups (LGMG) set up across Scotland. Each has adopted the national objectives agreed as a result of the previous NGMRG Review in 2005; together with a number of locally defined objectives designed to address the impact of geese in their locality. Further information on those seven Local Goose Management Schemes is available at: <http://www.gov.scot/Publications/2011/02/03083950/20>

As part of its function the NGMRG is required to conduct a multi-disciplinary review of the national policy framework every five years, and to report its findings to ministers. The last review was conducted in 2010 and the review findings were published in February 2011 – see 2010 Review of Goose Management Policy in Scotland .

The Scottish Government response to the 2010 review is also available at: <http://www.gov.scot/Publications/2011/02/17112253/2>

International Practice

As part of the 2010 review, the NGMRG considered arrangements for goose management in the EU, Scandinavia, Iceland and Greenland – see **Annex ?**

Damage caused by Canada geese must be viewed in context - the impact of any damage depends not just on the numbers of geese present but also the nature and uses of the site. A relatively small number of geese may cause significant problems in a small formal site, while a much larger population may cause no significant problems if the site is large, less formal, or little used by people.

Before any control is considered, it is important to carry out monitoring of the population to determine when in the year Canada geese use the site, and what they use it for. If geese are not present all year round, monitoring should also be carried out in other areas they use as any control measures may need to be coordinated with other landowners to ensure they are effective.

Although geese may be the most visible cause of a problem, they may not be the most significant. For example, water supply and the flow in a water body will have an enormous impact on the water quality.

The presence of other waterfowl species should also be monitored, as these may be affected by control measures.

Types of Damage

Canada geese, particularly if present in large numbers, may cause a number of problems:

- *Vegetation damage* - Grazing geese may damage lawns and other vegetation, particularly on the banks of ponds or lakes. The birds forage on a range of vegetation. As well as grass they will also eat aquatic and emergent plants which can be important for maintaining dissolved oxygen levels in water bodies. Geese may also damage vegetation by trampling, particularly around the edges of water bodies. In large numbers, the geese can also damage grass areas.

- *Droppings* - On lawns and grassland Canada geese droppings are unsightly, and the droppings may make paths dangerously slippery. Droppings in lakes and ponds add nutrients, particularly nitrate and phosphate, to the water, which can eventually seriously affect the water quality ecosystem. There is some evidence that they pose a hazard to human health if accidentally ingested.
- *Physical damage* - Large numbers of geese may create extensive areas of bare ground at the water's edge and cause erosion of the banks.
- *Aggression* - During the breeding season, geese may become more aggressive towards people, dogs and other waterfowl. Dogs may provoke a particularly fierce response from geese during the breeding season.

Management Options

Research on the control of Canada geese has identified a range of techniques. The research, which included one site with over 300 geese present in summer, suggests that control techniques used in isolation are unlikely to be effective. Control measures will only work if an integrated programme of management techniques is carried out.

In many cases, management options will necessarily be restricted by the need to preserve historic features, planting layouts and so forth. Not all management options will be appropriate for all sites.

All potential control methods are aimed at reducing the numbers of geese, rather than completely excluding geese from a site, as this is usually impossible to achieve. Most control methods may be less effective if the population is relatively small. Control measures can be divided into site-based and population-based techniques.

Site-based Management Measures

These do not require a licence and include:

- *Exclusion from islands* - Fencing islands in ponds and lakes used for breeding can discourage geese from nesting on the islands. A 1m chicken wire fence with a 10cm gap between the ground and the bottom of the fence will allow other waterfowl to use the island. This technique is most likely to be successful if islands are well vegetated as this discourages geese from flying over the fence.
- *Access to grazing areas* - Fencing around the margins of a water body can discourage geese from feeding in areas beyond. In this way they can be directed away from sensitive grazing areas. Replanting grassland areas

with shrubs decreases the food supply. Fencing these areas will be needed to ensure plants establish without grazing or trampling pressure.

- *Reduce visibility of water bodies* - Geese prefer to graze close to a water body which provides them with a safe retreat. By obscuring the views between feeding and grazing areas, geese will be discouraged from using them, however, this may be difficult to achieve in historic landscapes.
- *Controlling public access* - Fencing of water bodies can also be used to influence visitors, by restricting opportunities for feeding geese.
- *Interpretation* - Many people visiting sites value the waterfowl populations and consequently control measures may be controversial and should not be attempted without interpretation explaining the reasons for, and benefits of, carrying out control. For example, explaining that there are nature conservation benefits in reducing the geese population. Interpretation can also be used to discourage feeding of the birds, and inform people about aquatic ecology.
- *Other methods* - A number of other techniques can be used but are less well researched. Bird scaring is widely used in some areas on farmland but is less commonly used in aquatic habitats. Many scaring methods are also disturbing to visitors and nearby residents. Chemical repellents are used in North America but with limited effectiveness, and they are not currently approved for use in Britain.

Population-based Management

Most population-based management measures require a licence and include:

- *Translocation* - This method has been used in the past, but is no longer encouraged, as it simply transfers a problem to a different site. It is also an offence to release Canada geese into the wild without a licence. Unless other measures are taken, other geese may colonise a site which has had its previous population removed.
- *Egg-pricking, oiling or boiling* - These are an effective way of preventing hatching, as birds are very loyal to their nesting sites, but the longevity of geese mean that a long-term programme of this management would be necessary in order to significantly reduce a population. Oiling of eggs kills embryos by depriving them of oxygen. In order to carry out any of these operations, a licence for the work must be obtained (see below). Leaving eggs in place but preventing them from hatching means adults continue to protect them. Removal of eggs simply induces the female to lay more.

- *Culling* - This also requires a licence if it is to be done during the close season (1 February to 31 August, or 21 February to 31 August below high water mark). Outside the close season Canada geese can be shot by an authorised person, provided that other regulations concerning firearms safety, capture methods and so forth are adhered to. However this has practical difficulties on many sites. It may be more practical to round up geese during the moult, when they are unable to fly, however culling of geese is a very emotive issue.

Licensing of Control Operations

All wild birds, including Canada geese, are protected under Section 1 of the Wildlife & Countryside Act, 1981. It is an offence to take, damage or destroy their nests or eggs without a licence, and it is also an offence to release them into the wild.

Licences for culling in the close season, egg-pricking or translocation of Canada geese can be issued for a number of reasons:

- To prevent serious damage or disease
- To conserve and protect wild birds
- To conserve flora and fauna
- To preserve public health or safety
- To prevent serious damage to livestock, crops, forestry or fisheries
- For the purposes of air safety

Licences are not issued solely to prevent damage to property.

Arrangements for Goose Management for Countries within the EU, Scandinavia, Iceland & Greenland

In the 2010 review, contacts for countries within the EU, Greenland and Iceland were provided through the editor in Chief of the Goose Bulletin published by the International Goose Specialist Group. If no responses were obtained from the nominated persons, then additional requests for contacts were made through the country representatives of Birdlife International.

Representatives were asked to provide information on their country's goose policy framework, the species which cause conflicts, the goose management options, funding arrangements and expenditure, and hunting regulations. Additional supporting information was taken where necessary from web pages of the Federation of Associations for Hunting and Conservation of the EU (www.face-europe.org) but this was only possible for countries that had submitted hunting guidance in English.

Responses were received from:

- Iceland (Icelandic Institute of Natural History & Environmental Agency of Iceland);
- Flanders, Belgium (Research Institute for Nature and Forest);
- Greenland (Greenland Government);
- Germany (Kreis Wesel Biology Station);
- England (Natural England);
- Italy (Trieste University);
- France (Ministry of Environment);
- Bulgaria (Bulgarian Society for the Protection of Birds);
- Estonia (Institute of Agricultural and Environmental Sciences and Environment Ministry);
- Denmark (National Environmental Research Institute);
- Netherlands (SOVON);
- Sweden (Swedish University of Agricultural Sciences);
- Norway (Institute for Nature Research (NINA) and Norwegian Directorate for Nature Management).

Policy, Funding Arrangements & Overall Approach to Goose Management

Country	National policy for goose management	Regional management/policy	Annual expenditure ¹
Sweden	No	Yes (county)	Not available (combined costs are only available for meeting compensation for damage caused by cranes, swans and geese)
Norway	Yes, developed in 1996 (in Norwegian but with English abstract)	Yes (county) (in Norwegian only eg. Forvaltningsplan for gjess i Hordaland and Forvaltningsplan for Gjess i Oslo og Akershus)	310,000 E
Iceland	No	No	Not applicable
Bulgaria	No	No	Not available
Denmark	Circa mid 1990s (in Danish only)	No	100,000 E for bait only (estimate)
France	No	No	Not applicable
Germany	No	Yes (Federal state)	2-3,000,000 E (estimate)
Greenland	No	No	Not applicable
Netherlands	Yes (in Dutch only)	No	12,300,000-13,900,000 E (agri-environment schemes /compensation only over years 2005/2006 to 2007/2008)
Estonia	No	No	200,000 E (based on 2003 figures)

¹ It was not possible to derive comparative costs for goose management between countries due to lack of information available on annual expenditure (national or regional) for all countries. For the few countries where some relevant information was available, it was often an estimate rather derived from government databases or for only partial costs of meeting goose management costs.

Italy	No	Yes (Province)	3,000 E (Province of Gorizia only 2008, 2009)
England	No	No	2,600,000 (based on mean of 10 years)
Belgium	No	Yes (regions)	?

Goose Management Options (for goose species considered to cause damage)

Country	Payment schemes (rate)	Non lethal scaring		Lethal scaring/hunting		Network of specific goose reserves (excluding SPAs etc)	Other
		Use of	Funding provided	'Quarry species'	Out of season licences		
Sweden	Compensation (assessment of damage carried out by inspectors employed by county administration boards)	Yes	Yes	Yes	Yes	No	Sacrificial crops
Norway	Compensation: (i) crop type (pasture <i>versus</i> cereals) and; (ii) goose densities (based on independent counts made)	Yes	Equipment only	Yes	Yes	No	-
Iceland	-	No	No	Yes	Yes	No	-
Bulgaria	Agri-environment scheme (per ha) Compensation (per ha)	No (Illegal)	No	Yes		No	-
Denmark	No	Yes	Equipment only	Yes	Yes	No	Bait fields with grain
France	No	-	-	Yes	No	No	-
Germany	Compensation (assessment of damage by an independent	Yes		Yes	Yes	No	-

	appraiser from agricultural administration. Damage is based on estimating actual loss of crop by comparison of height of grazed and non-grazed areas) Flat rate (per ha)						
Greenland	No	-	-	Yes		No	
Netherlands	Agri-environment scheme (per ha) Compensation outwith reserves (assessment of damage carried out by independent appraiser who must also confirm that scaring techniques have been deployed. Damage is based on estimating actual loss of crop by comparison of height of grazed and non-grazed areas)	Outwith goose reserves only		Outwith goose reserves only	Yes	Yes linked to agri-environment schemes	Egg pricking/nest destruction Cull by gassing Habitat manipulation to reduce feeding opportunities Fencing off breeding sites
Estonia	Compensation (Assessment of damage by a commission of at least three people who must also confirm scaring techniques have been deployed. Damage is determined according to crop type: by level of goose droppings or visual assessments of % damage in test plots)	Yes	No	Yes	No (as yet)	No	-

Italy	Compensation (Assessment of damage, which is carried out by the farmers and information is submitted to the Provincial administration). The amount is 'financial aid' and does not meet the full cost of losses incurred	No	No	No	No	No	-
England	Agri-environment schemes (per ha)	Yes	No	Yes	Yes	No	Addition to general open licence
Belgium	Compensation (assessment of damage by an independent appraiser from the Nature Conservancy Department. Damage is determined by estimating actual damage by calculating the difference in yield between grazed and ungrazed areas of the field)	Yes	No	Yes	Yes	No	Nest destruction

Hunting Arrangements for Goose Species

Country	Bag limit for 'quarry goose species'	Bag reporting scheme for 'quarry goose species'	Sale of goose carcasses permitted	Hunting licence renewal	Hunting Proficiency exam	Regional variation in protected status of species
Sweden	No	Voluntary	Yes	Annual	Yes	Yes

Norway	No	Mandatory	Yes (approved by the Food Safety Authority)	Annual	Yes	Yes
Iceland	No	Mandatory	Yes	Annual	Yes	Yes
Bulgaria	Yes (daily quota for individual farmers)	Voluntary	No	Annual	Yes	No
Denmark	Yes (set to individual land owners)	Mandatory	Yes (but origin of carcass traceable)	Annual	Yes	No
France	No	Voluntary (mandatory for night time shooting)	No	Annual	Yes	No
Germany	No	Mandatory	Yes	1-3 years	Yes	Yes
Greenland	No	Mandatory	Yes (professional hunter only)	Annual	No	Yes
Netherlands	No	Mandatory	Yes	Annual	Yes	No
Estonia	No	Mandatory	Yes	Annual	Yes	Yes
Italy	NA (geese fully protected)	N/A	N/A	N/A	N/A	N/A
Belgium	No	Mandatory	Yes (but seasonal restrictions)	?	?	?