CIVIL AVIATION AUTHORITY
OF NEW ZEALAND
Te Mana Rererangi Tūmatanui o Aotearoa

Advisory Circular AC139-16

Revision 1

Wildlife hazard management at aerodromes

XX XXXX 2025

General

Civil Aviation Authority (CAA) Advisory Circulars (ACs) contain information about standards, practices, and procedures that the Director has found to be an **acceptable means of compliance** with the associated rule.

Consideration will be given to other methods of compliance that may be presented to the Director. When new standards, practices, or procedures are found to be acceptable they will be added to the appropriate AC.

Purpose

This AC provides information and guidance on Wildlife Hazard Management at aerodromes. The guidance should be used to inform decision making to meet the requirements of rule 139.71.

The AC also contains information related to the management of wildlife in the vicinity of aerodromes for the guidance of aerodrome operators and local territorial authorities.

The AC describes a range of methods to assist aerodrome operators and local territorial authorities to establish or enhance a wildlife hazard management programme.

Related Rules

This AC relates specifically to Civil Aviation Rule Part 139.

Change Notice

Revision 1 replaces the appendix with a new appendix which provides scientific names, protection status and methods of control, as well as website links.

We have also:

- updated the contact information for the Ornithological Society of New Zealand (Birds New Zealand)
- moved some content to other sections to provide more context
- made stylistic and editorial changes in line with AC standards, and
- added a version history.

Published by
Civil Aviation Authority
PO Box 3555
Wellington 6140

Authorised by
General Manager, Strategy, Policy and International Engagement

Version History

History Log

Revision No.	Effective Date	Summary of Changes
AC139-16, Rev 0	7 October 2011	Initial issue
AC139-16, Rev 1	XX XXXX 2025	Replaces the appendix with a new appendix which provides scientific names, protection status and methods of control, as well as website links Moves some content to other sections to provide more context Updates the contact information for the Ornithological Society of New Zealand (Birds New Zealand) Makes stylistic and editorial changes in line with the AC standard Adds a version history.

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Introduction

1. Rule 139.71 requires certified aerodrome operators to develop and adopt a wildlife hazard management programme that aims to manage the hazard that wildlife represents to aircraft operations.

2. The presence of wildlife in the vicinity of aerodromes can present a significant risk to airport operations. Aircraft wildlife strikes can put people in danger, cause damage to aircraft resulting in costly repairs, and cause operational disruptions.

3. This AC provides guidance on~~s~~ the key parts of a wildlife hazard management programme. It has been written to provide guidance to ~~help~~ any aerodrome operator, whether certified~~cated~~ or not, to establish or enhance a wildlife hazard management plan (WHMP).

4. The management techniques described in the first part of this AC are general in nature and do not necessarily target a specific problem species. This AC also raises other issues aerodrome operators should consider as part of their strategic planning process.

5. A WHMP or programme should be implemented to effectively manage risks posed by wildlife hazards.

Abbreviations

Note: *While some abbreviations used in this AC are standard abbreviations from Rule Part 1, Definitions and Abbreviations, they have been listed here for convenience*.

Abbreviations	
AC	Advisory circular
ATC	Air traffic control
CAA	Civil Aviation Authority
DOC	Department of Conservation
NZAWHG	NZ Aviation Wildlife Hazard Group
PIC	Pilot- in- command
SMS	Safety Management System
WHMP	Wildlife hazard management plan

Overview of a wildlife hazard management programme

Background

6. Wildlife hazard management is a systematic approach of identifying, assessing and mitigating risks posed by wildlife to ensure the safety of people, assets and operations. In New Zealand these hazards primarily manifest as strikes and near- strikes . To mitigate the risks associated with strikes it is important to understand the wildlife species and behaviours that can become a hazard to aviation.

7. Wildlife hazard management aims to influence wildlife behaviour on or in the vicinity of an aerodrome through habitat modification, wildlife deterrence, relocation of wildlife and lethal control.

8. A wildlife management programme could be a set of procedures designed to mitigate risks and hazards associated with wildlife at airports and in the vicinity of aircraft operations. The details should vary depending on the wildlife species present, the surrounding environment, the types of aircraft operations and number of aircraft movements.

9. The programme should take into consideration management of bird flock activity, habitat encroachment, wildlife attractants, nesting sites and how wildlife behaviour is impacted by environmental factors. The management of these considerations may be site-specific

but also can be transferrable between airports. Risk assessment methods, training, analysis and research outcomes may be common across aerodromes.

10. If there is enough evidence of an increased risk, management should be considered through safety management systems (SMS) or a risk management plan.

11. Collaboration and engagement with relevant stakeholders is a crucial aspect of a wildlife hazard management programme. These stakeholders include operators, air traffic control (ATC), wildlife conservation agencies, local councils, environmental organisations, scientists and other government agencies.

12. Effective communication channels can ensure all stakeholders are informed about potential hazards and mitigation efforts. It allows for diverse perspectives to be considered, fosters cooperation and promotes a shared commitment to safety.

Holistic and integrated approach

13. An effective wildlife hazard management programme is usually developed with input from a variety of sources. These range from the aerodrome operator, ATC, and aircraft operators to people and organisations that influence land use such as local (territorial or regional) authorities and other government agencies. They also include the Department of Conservation (DOC), biologists and ornithologists, and wildlife protection groups such as Royal Forest and Bird and Birds New Zealand.

14. An effective programme takes an holistic approach, starting with an assessment of all the wildlife species in the area to ensure that a reduction in one species or the creation of a habitat to deter one species will not be beneficial to another species.

15. Each aerodrome's different ecological structures and environmental conditions mean similar control techniques may have different consequences for the same target bird species. Therefore, a programme should be independently devised for each aerodrome and its results monitored carefully.

Wildlife Hazard Management Plan (WHMP)

16. A WHMP should include:

- background information on the aerodrome environment
- procedures for wildlife hazard monitoring
- procedures for data collection, reporting and recording
- a wildlife risk assessment
- training and education (staff, pilots, ATC)
- identification
- response
- hazard assessment
- dispersals
- habitat and land management, and
- details on when to review the WHMP.

Budgets

17. Funding is another important aspect of an effective wildlife hazard management programme . Aerodrome operators should cost out management methodologies when preparing their annual budgets. Depending on the type of wildlife hazard and the hazard management methods used, the costs associated with wildlife hazard management may vary significantly throughout the year.

18. Expenditure may be seasonal or constant over the year, depending on the wildlife hazard management programme.

19. Aerodrome operators should also consider how their infrastructure design can encourage or discourage wildlife, for example when installing permanent features on physical infrastructure or purchasing equipment for ~~as a result of~~ the wildlife hazard management programme.

Training

20. Aerodrome operators should provide sufficient training to staff responsible for wildlife hazard management.

Training may include:

- wildlife observations and identification of wildlife species
- assessment of wildlife populations and the description of their behaviour

- data collection techniques
- safe collection of wildlife remains from strikes
- safe operating practices, and
- assessment of the effectiveness of wildlife management activities.

Bird incident statistics

Collecting strike data

21. Part 12, *Accidents, Incidents and Statistics*, requires the pilot-in-command (PIC) of an aircraft to report bird incidents to ~~the~~ CAA ~~Civil Aviation Authority.~~ Guidance can be found at this link: Reporting bird incidents | aviation.govt.nz

22. The online form CAA Occurrence Reporting should be used when reporting bird strikes (with or without damage) or near strikes. Alternatively, PICs can use this form: CA005B Form - Bird Incident Notification (aviation.govt.nz)

23. CAA has adopted the following system for classifying whether a wildlife occurrence occurred on or off the airport:

    "On airport" wildlife strikes are strikes that occurred at or below 200ft above ground level (AGL) during the landing or approach or 500ft AGL during the take-off or climb. "Off airport" wildlife strikes are strikes that occurred above 200ft AGL during the approach and above 500ft AGL during climb.

    Using this system, the critical information to classify whether an incident is on or off airport is the aircraft's phase of flight and also its altitude.

Collecting data on wildlife activities

24. Accurate and reliable data is vital for an effective wildlife hazard management programme.

25. Wildlife monitoring inspections may include the following:

    - details of reporter
    - date and time
    - numbers, species, and location of wildlife observed
    - weather
    - actions taken in response to the presence of wildlife.

Analysing data

26. Analysis of the data collected could be used to determine whether a wildlife hazard management programme is effective and to make strategic decisions about the actions

required to manage a specific hazard. As wildlife activity can be seasonal, wildlife data should be considered.

27. When analysing wildlife incidents consider whether they:

- occurred on or off the aerodrome
- involved a predominate bird species
- involved a particular aircraft type
- were concentrated during particular times of the day (which could be due to peak movements of aircraft
- were seasonal (which could be related to food sources or migratory patterns)
- involved a particular area of the aerodrome (e.g., one end of a runway, which could indicate a specific habitat problem area or the migratory habits of the birds)
- happened at a similar height (which might indicate migratory patterns)
- what options are available if wildlife incidents occur off the airport.

This analysis is also useful for measuring the effectiveness of controls being implemented.

Note: *CAA publishes a bird incident rate dashboard on its website: Dashboard \| aviation.govt.nz These reports are published to help aerodrome operators meet their responsibilities for wildlife management.*

Managing information

28. It is important that bird incidents are reported so the extent of the bird hazard problem can be determined so CAA and stakeholders (such as the aerodrome operator, aircraft operator can make informed decisions to manage the risks. Wildlife incident data is important at local, national and global levels. Refer to the *Collecting data* section earlier in this AC for more detail.

29. In New Zealand a 'bird incident' is defined in Part 12, *Accidents, Incidents and Statistics* as:

an incident where—

(1) there is a collision between an aircraft and one or more birds; or

(2) when one or more birds pass sufficiently close to an aircraft in flight to cause alarm to the pilot:

30. Aerodrome operators should report to CAA (using a Part 12 incident report) when bird remains are found at an aerodrome and it is known or suspected that a bird incident report has not been filed.

New Zealand experience

Bird species

31. Analysis of the reported bird incidents indicates the prevalence of a few problem species:

- Australasian harrier hawk – *Circus approximans* Peale
- Australian magpie – *Gymnorhina tibicen*
- Black-billed gull – *Chroicocephalus bulleri*
- Canada goose – *Branta canadensis*
- Eurasian skylark – *Alauda arvensis* Linnaeus
- European starling - *Sturnus vulgaris Linnaeus*
- Finch (chaffinch, greenfinch, goldfinch and yellowhammer) – *Chloris chloris*
- House sparrow – *Passer domesticus*
- Mallard duck – *Anas platyrhynchos Linnaeus*
- Paradise shelduck – *Tadorna variegata*
- Red-billed gull – *Chroicocephalus novaehollandiae*
- Rock pigeon – *Columba livia* Gmelin
- Southern black-backed gull – *Larus dominicanus* Lichtenstein
- South Island pied oystercatcher – *Haematopus finschi* Martens
- Spur-winged plover – *Vanellus miles*
- Welcome Swallow – *Hirundo neoxena* Gould

32. Additionally, many incidents have been reported against 'gulls' in general. As there are only three gull species in New Zealand, this suggests that, in addition to the large black-backed gull, the smaller species of black-billed gull and red-billed gull could also be problems.

Note: *These are the most common bird species, however over 10,000 bird strikes have been reported as "Unknown". When reporting a bird strike, it is useful for aerodrome operators to identify the relevant species if this is possible.*

33. Generally, control methods for small birds are similar no matter what the species. However, if the problem species is not listed above, aerodrome operators ~~you~~ may need to consult an ornithologist to help establish a dedicated programme.

Wildlife hazard risk assessment

34. One of the first steps when devising a wildlife hazard management programme is to undertake an environmental survey or wildlife hazard risk assessment. This survey focuses on the conditions attracting wildlife to the aerodrome and needs to be completed before any major habitat changes are implemented.

35. The survey should determine:

- the number of wildlife hazardous to aviation in the area
- the species of bird in the area
- how the birds are distributed, both spatially and temporally

- what are the things that attract them, e.g. food, flora, fauna
- why are the wildlife in the area
- how birds move in relation to the aerodrome and aircraft flight paths.

36. It should also assess the area's geography, hydrology, soil, climate and vegetation, building designs and human activities such as agricultural and waste-disposal operations.

37. This research should provide some of the information needed to understand why hazardous species are at the aerodrome and, as a result, suggest~~s~~ the habitat modifications that should be considered.

38. It is important to establish birds' habitual behaviour and relationship to the aircraft flight path, because they may not pose a risk in some combinations of circumstances.

39. Regular data collection should be used to assess the effectiveness of the wildlife hazard management programme.

Implications of land use activities near aerodromes

Planning land use near aerodromes

40. An aerodrome operator can control the land use practices on aerodrome owned or controlled land to reduce the aerodrome's attractiveness to wildlife, however land use activities outside the aerodrome's boundary may result in increased wildlife risks. This increases when birds make regular flights across an aerodrome (e.g., when they fly between roosts and feeding areas).

41. It is important for aerodrome operators to consider making submissions during urban, regional planning or district plan reviews and work with local authorities to ensure they are aware of activities that influence bird populations, which can be hazardous to air transportation if near an aerodrome and approach or take-off flight paths for aircraft.

42. When hazardous land uses are already established and prohibitions or restrictions are not options, remedial action may be taken by:

    - engaging with owners and managers about the hazards created by their operations
    - helping to develop programmes to minimize the operation's attractiveness to birds.

Hazardous land use practices

Landfills

43. Landfills should not be located close to aerodromes, because they are very ~~immensely~~ attractive to scavenging wildlife due to the abundant food source. However, landfills can be made less attractive to wildlife and particularly birds with:

    - overhead wires installed to interfere with the birds' flight path
    - the working area of the tip face made as small as possible and, preferably, contained in a pit where access by birds is restricted

- refuse being covered with soil daily to reduce available food sources when the landfill is not operating.

44. The dumping of food waste should be strictly controlled, with waste covered immediately.

45. Most active management techniques used at aerodromes can also be used effectively at landfills. Reducing a food source should reduce the bird population.

Wastewater treatment plants

46. Wastewater treatment plants should also not be located close to aerodromes. These sites normally contain settling or aeration ponds or other expanses of water that attract water fowl and sea birds.

47. Control methods aim to minimise the attractiveness to birds of the ponds and their surroundings as resting areas. They include:

- wires erected across ponds
- the gradient of the side slopes of ponds increased to deter birds from resting and to interfere with the birds' flight path to and from the water banks around ponds to obscure the birds' view of predators when they are on the water
- vegetation planted around ponds to reduce the areas available for resting and interfere with the birds' view and flight paths.
- When tanks are used, the upper surface should be covered completely or with a wire grid or netting.

Agriculture

Crops

48. Aerodromes in rural locations are often bounded by areas suitable for agriculture. Some aerodrome operators choose to use parts of their lands for crop production to increase revenues (e.g., brassica, corn or root crops or grass to be harvested as supplemental feed), however aerodrome operators should consider the risks associated with undertaking this type of activity and ensure that this risk to aviation is appropriately managed.

49. If cropping is to be conducted at the aerodrome, operators should get advice from plant scientists or ornithologists to gauge the effect the activity may have on birds in the area. Grains and cereals are major bird attractants, so should be avoided.

50. Aerodrome operators should engage with surrounding farmers to discuss the issues related to bird attractant agriculture and develop good working relationships with them. This will help to influence the decisions on choice of crops planted and allow aerodrome operators to remain informed of changes to plantings.

51. Ploughing and cultivating of the soil attracts gulls and, in the South Island, the black-fronted tern.

52. To mitigate the bird hazard aerodrome operators should try to influence the time of day that agricultural work takes place near the aerodrome (e.g., try to have it conducted at night, when aircraft traffic is likely to be minimal).

Animals and livestock

53. The rearing of animals can also attract birds, particularly during calving and lambing seasons, which provide an abundant food source for birds.

54. Aerodrome operators should engage with the surrounding farmers to keep animals away from paddocks neighbouring the aerodrome during this period and to be kept informed so that wildlife hazard management activity can be proactively used to manage this risk.

55. Cattle sale yards also attract birds with their abundant food sources (e.g., flies and other insects attracted by the animals). Aerodrome operators should engage with local authorities to ensure such activities are not planned or located close to aerodromes.

Recreational activities

Grounds

56. Finely-mown fields (e.g., golf courses, sports fields including school grounds, parks and picnic areas) represent potentially hazardous land uses, because of the high risk of food waste being left at the sites. Viewing areas at aerodromes, where people farewell others or watch the activity at the aerodrome, are also potentially hazardous land uses for the same reason.

57. These potential feeding grounds may cause birds to fly across the aerodrome or flight path from their roosting site or to use the aerodrome as a resting place.

58. Aerodrome operators should work with local authorities and sports clubs to minimise the food sources for birds in these areas by encouraging the careful management of food waste and grounds.

Water

59. Many aerodromes are situated in coastal regions that are used recreationally and by people for activities like fishing and boating. Aerodrome operators should assess and control bodies of water if waterfowl may be attracted.

60. Where possible, aerodrome operators should discourage recreational water users from cleaning fish or disposing of waste where birds, once attracted, might create a hazard to aircraft.

61. Aerodrome operators should engage with local harbour masters and fishing, yachting and boat clubs to manage these food sources that may create a hazard.

Passive management techniques – habitat modification

62. Passive and active management techniques work together to ensure effective bird management. Active management techniques (i.e. dispersing or deterring birds from the aerodromes) can be counterproductive if, for instance, passive measures have not reduced the availability of food, water and shelter at other parts of the aerodrome or its

surroundings. Longer-term passive management techniques (i.e., modifying a bird's habitat by removing ponds or planting different ground cover) reduce the need for active management measures.

63. Birds develop habits quickly, so become accustomed to control techniques that are excessive or repetitive or visual deterrents that are stationary for extended periods. Therefore, it is important to conduct a range of activities to maintain the programme's overall effectiveness.

64. Passive management techniques modify the wildlife behaviour to make it less attractive or unattractive.

65. The main attractants to aerodromes and their surroundings for wildlife are food, water and shelter to feed, rest and nest safely.

Minimising or eliminating attractants

66. Food sources at aerodromes include food waste, seed-producing and aquatic vegetation, rodents, and invertebrates. Aerodrome operators should monitor the food, water source and shelter regularly.

Food

Waste

67. As part of the WHMP, Aerodrome operators should consider:

- managing edible waste in garbage.
- monitoring restaurants and other food outlets at the aerodrome to ensure their food wastes are properly contained during disposal.
- monitoring carparks, viewing areas and other outside places where people congregate to ensure food waste left in the area does not become a wildlife attractant. Aerodrome operators should consider placing signs to discourage bird feeding in these areas.

Invertebrates

68. Invertebrates make up a large part of many animal's food sources.

69. Worms are a strong attractant to birds of all sizes. When it rains, worms are often seen on paved areas.

70. A longer-term solution to eradicate worms is a vermicide spraying programme. An aerodrome operator should consider spraying all grass areas or just the area surrounding the manoeuvring area.

71. Following rainfall, worms may congregate on hard surfaces. Removing these worms from the tarmac can assist in reducing the number of birds attracted to this food source.

72. Insects in larvae or adult form such as grass grub, porina moth and crane fly attract large numbers of birds. Aerodrome operators may need expert assistance to identify an insect species being eaten by birds. Often insects are a seasonal problem, mostly around spring and summer.

73. An aerodrome operator should consider spraying grass areas annually, targeting these insects when they are evident.

74. Blue light is thought to potentially attract insect life at night, which can in turn attract birds.

Water

75. Ducks, gulls, and shorebirds are particularly attracted to surface and standing water. Aerodrome operators should consider modifying or eliminating all physical features that hold standing water, for example:

- draining and backfilling pits or depressions that regularly collect water after rain
- clearing clogged waterways, especially drainage ditches, because not only are birds attracted by the water for drinking and bathing, they benefit from the insect and aquatic life that flourishes there
- covering bodies of water such as ponds ~~with wire~~ to stop birds from landing (i.e., wire or netting)
- grading the bank's surrounding ponds to discourage birds from resting in the water as they are less likely to frequent areas when they cannot see predators above the bank
- grading ditches so water runs off as rapidly as possible
- cutting grass and other vegetation on sloping banks
- replacing ditches with underground drainpipes or culverts.

76. Aerodrome operators should also engage with DOC or local authorities if wetland areas are within the aerodrome surroundings.

Shelter

77. Aerodromes provide a good place for birds to shelter where they can loaf, perch, roost and nest. Birds often seek the shelter of buildings on roof ledges, towers, aerials and fences. They nest on roofs and ledges, in crevices and holes, in vents and ducts as well as in long grass, shrubbery and vegetation. However, once identified, these habitats can usually be modified to deter birds from sheltering there.

78. Birds also find safety in open spaces such as on paved areas and open short grass fields that afford clear views of the surroundings, so birds can see approaching predators.

79. Paved areas retain heat, so provide warmth during the evenings at certain times of the year. Paved areas are also a hard surface onto which birds can drop shells and the like to break them and get at the food source inside.

Exclusion techniques

Netting

80. Netting can be used in a variety of indoor and outdoor areas to stop birds from entering an area to feed, roost or nest.

81. Netting is often used:

- in the open ceilings of buildings or across spouting
- across small ponds and drainage ditches
- over small areas of earthworks to prevent birds foraging for worms, insects or new seed
- over small to medium trees to discourage birds from roosting (although other visual bird deterrents are often more attractive ~~aesthetically pleasing~~).

82. However, netting can become a hazard if it becomes free and lodges in aircraft engines. Therefore, aerodrome operators should not use netting on the manoeuvring area.

Wire

83. Wire can be used in a variety of ways to exclude birds from specific areas.

84. Wires can be placed in a grid of about a square metre or more depending on the targeted species. This is effective on flat roofs and across aeration ponds for medium to larger birds. However, it is not effective against small bird species.

85. Wires placed much higher above the surface have been used in some locations such as refuse sites. This interferes with the bird's flight pattern and discourages it from the area.

86. Wire or metal spikes set in clusters or an extended strip can be used to deter birds, particularly smaller species, from landing on building ledges or on top of aerial towers or power poles. The spikes make it impossible for the bird to land. Aerodrome operators should be careful not to put wires in areas where it might be difficult to see.

Chemicals

87. Chemicals used for exclusion purposes are usually sticky substances (i.e., tactile repellents) that deter birds from roosting on ledges and other flat surfaces. Although effective in the short term they require reapplication (often annually) to maintain their effectiveness.

88. Aerodrome operators should consider whether such areas will be accessed frequently by people (e.g., during preventative or regular maintenance routines).

89. Other chemicals can be used to repel wildlife. Chemicals including methyl-anthranilate can irritate a bird's sense of taste and smell.

Managing ground cover

Vegetation

90. Aerodrome operators should consider how vegetation management can be used to manage wildlife risks.

Grass management

91. Most aerodromes have grassed areas, which are major attractants to birds, primarily for feeding, but also for loafing and sometimes nesting. The most effective grass management technique depends on the problem bird species.

92. An aerodrome operator should also consider the environment, including the soil type and climate, in which the grass will be grown. The grass type that best matches the management technique should also match the environment in which it is to be planted.

93. Weeds provide another food source and cause less dense patches of vegetation, where birds can rest, so a thick sward of grass is ideal. Aerodrome operators could engage with local farmers, seed suppliers, local authority parks and reserves staff, green keepers or scientists specialising in grass management when choosing the grass to ensure the best growth potential.

94. Grass requires regular management including mowing, weed spraying, and fertiliser and pesticide application. Grass management can result in an effective long-term solution to manage birds.

95. The best grass height depends on the bird species being targeted. Short and long grass management techniques have advantages and disadvantages.

Long grass technique

96. Long grass can be used to discourage birds that like wide open spaces where they can see any threat or predator approaching.

97. Grass should grow thickly to be most effective as a deterrent. The grass should be cut low and fertiliser applied before spring to maximise the benefit obtained during spring growth and to encourage the grass to grow densely.

98. Long grass should be about 30–40 cm in height, but not left to go rank, which creates a thatching effect across the ground, negating its purpose.

99. An aerodrome operator should avoid allowing seed heads to develop, attracting birds. They should also be careful to ensure the grass does not obstruct visual navigation aids or signs.

100. Long grass should deter larger birds such as spur-winged plovers from feeding and loafing in these areas. Smaller birds such as starlings, sparrows and finches should not be attracted to the longer grass unless it begins to seed. However, birds such as the Canada goose and paradise shelduck feed on grass, particularly when grain, pea and cereal crops are not available. They are particularly attracted to new grass growth.

101. Birds such as ducks and black-backed gulls have also been known to build nests in longer grass. Long grass can also attract rodents. Careful monitoring is required to ensure rodents do not become a food source attractive to another species such the harrier (hawk) or become a wildlife hazard themselves.

Short grass techniques

102. Short grass can be used to discourage rodents and other wildlife that might find refuge or protection in longer grass. This technique may provide areas where larger bird species can loaf and feed.

Combination long and short grass techniques

103. Some aerodromes have adopted a combination of long and short grass. Grass is grown long around the runway and taxiway areas, but kept short in outer areas.

Planting out

104. Another way to modify a bird's habitat is to plant out the area being used by the birds.

Active management techniques

105. Active management techniques are used to deter, repel, relocate or lethally control wildlife. They do not modify the birds' habitat, but aim to disperse the birds (i.e., visual or auditory deterrents) or remove them (i.e., elimination and relocation).

Dispersal techniques

106. Birds quickly become accustomed to deterrents that are used excessively or exclusively. Therefore, it is important to use a range of deterrents and to change the location of deterrents regularly and randomly to maintain their effectiveness. Combining dispersal techniques with removal should also keep the birds wary of the deterrent.

107. Migratory birds can pose additional dispersal challenges, because of their transient nature. Aerodrome operators should determine their flight paths and habits to develop appropriate wildlife management techniques. Seasonal bird hazards should be published in the *New Zealand Aeronautical Information Publication* or notified directly to aircraft operators.

Visual deterrents

108. Visual deterrents are visual objects that startle or deter wildlife species and include kites, flags, scarecrows, effigies and reflective tape.

Kites

109. Kites have been used to good effect to scare birds, especially kites in the form of predatory birds. This technique should be a more effective control against smaller birds.

110. An aerodrome operator should consider the risk to aviation when operating a kite, and consider the requirements of Part 101 when operating a kite in the vicinity of an aerodrome. It is important such items are well-tethered and do not pose a threat to aircraft

Other visual deterrents

111. These include:

- ***Statues*** of predatory birds have been used to limited effect against smaller bird species.
- ***Tinsel strips***, streamers on strands of wire from multiple electric fence standards, or rotating shapes with shiny surfaces. Use such devices cautiously to ensure pilots are not dazzled.
- ***Metal cat faces*** with prominent eyes hung in trees or shrubs have also been used to good effect to discourage smaller birds from roosting or nesting.
- ***Human and vehicle presence*** Periodic patrols should be undertaken in areas where birds congregate. However, if birds become accustomed to vehicles they will stay just out of ~~its~~ range without dispersing.
- ***Trained Predators*** like dogs and raptors can act as a deterrent and prompt hazardous wildlife to disperse. Aerodrome operators should consider and manage the risk to aviation that these deterrents may introduce to the aerodrome.

Auditory deterrents

112. Auditory deterrents target the animal's hearing to cause distress.

- ***Pyrotechnics*** are effective visual and auditory deterrents – a flash of light and an explosive noise. As with other deterrents excessive use can reduce their effectiveness.
- ***Ultrasonic devices*** transmit noises above the range of most human hearing and cause animals distress. They have been used effectively, predominately in hangers. Aerodrome operators should consider the effect of the noises on humans and animals that are permitted at the aerodrome (animals being transported, or assistance animals).
- ***Bird distress and predatory bird calls***

Playing bird distress calls over loud speakers, targeting a specific bird species, has been used effectively. Playing predatory bird calls has some effect against smaller birds. Aerodrome operators should consider how bird distress calls are used as some bird species (e.g., magpies) are attracted to the calls of their own species. Operators should seek expert advice to ensure birds will disperse and not attract more birds to the area.

Removal techniques

113. Removal techniques include elimination and relocation. However, authorisation is often required to disturb species.

Protected species

Wildlife Act 1953

114. The Wildlife Act 1953 regulates the control and protection of wildlife. It sets out, among other things, levels of protection for birds. Birds in New Zealand are protected unless listed in the Act's Schedules. The Schedules of relevance to the control of birds at aerodromes are:

- Schedule 1 – Wildlife declared to be game
- Schedule 2 – Partially protected wildlife
- Schedule 3 – Wildlife that may be hunted or killed subject to Minister's notification
- Schedule 4 – Wildlife not protected, except in areas and during periods specified in Minister's notification
- Schedule 5 – Wildlife not protected.

View the Act at www.legislation.govt.nz

Authorisation

115. Aerodrome operators must obtain authorisation to kill or disturb a protected species from the local DOC office, stating which birds are intended to be controlled.

116. Such authorisation is likely to be subject to conditions. It is usually preferred that all attempts using alternative methods are tried before protected birds are killed, and only then is killing authorised if the birds are constituting a hazard to the safe operation of aircraft. The number of birds killed is to be kept to a minimum.

117. Protected bird kills must be recorded using leg bands. Details must be sent to DOC. Any unusual species killed might also need to be frozen, pending further notice by DOC.

118. An aerodrome operator should maintain accurate records when this authorisation is invoked, and receive authorisation from DOC at least annually.

119. Aerodrome operators must be familiar and only act within the conditions of the authorisation as failing to do so may result in severe consequences.

Relocation

120. For protected bird species that are rare or have some other particular significance, attempts should be made to capture and relocate them away from the aerodrome.

121. Trapping or netting can be attempted with help from DOC, local animal welfare agencies or expert ornithologists. The objective is to capture the bird with the minimum of stress and harm for the bird.

122. Although not protected or rare, magpies have been successfully relocated to other territories; however, magpies' distress calls may attract other magpies. Aerodrome operators may want to contact their local DOC or council for advice on doing this safely.

Targeting eggs and juveniles

Eggs

123. Aerodrome operators could reduce the local population of a bird species by finding and destroying eggs. This has the long-term effect of reducing the number of breeding birds and the number of juvenile birds in the air.

124. A continual failure in breeding at a particular site should lead some bird species to leave the area. Birds such as the black-backed gull can have a life span of up to 28 years, so reducing the size of the breeding colony can be effective.

125. To overcome the problem of extending the breeding season, eggs can be injected with formaldehyde to kill the embryo. When this takes place eggs should be marked and left in the nest. The aerodrome operator should monitor the nest to ensure no new eggs are laid. A bird may continue to lay on the nest until it is clear the eggs are unviable. By this stage, however, the bird is unlikely to reproduce again that season.

126. Expert advice should be sought when considering this method of control. When this method is used dye should be added to the solution injected, to ensure anyone taking the egg will be aware that that the content is inedible.

Lethal Firearms

127. Where it is not possible to remove a wildlife hazard using other means the use of lethal cartridges fired from firearms should be considered. Any person using a firearm at an aerodrome must have a Firearms Licence. An aerodrome operator should closely control the use of firearms at the aerodrome and ensure that any staff using firearms are appropriately trained to minimise the risks to members of the public and aircraft.

Expert assistance

128. Ornithologists can provide consulting services to help develop wildlife hazard management programmes. (Some also specialise in wildlife hazard management.) Local ornithologists can advise aerodrome operators and carry out the ecological survey and annual bird counts.

129. For local ornithologists, aerodrome operators should contact the Ornithological Society of New Zealand (Birds New Zealand), PO Box 834, Nelson 7040, or eo@birdsnz.org.nz

130. Scientists from Landcare Research or universities can help with managing soil, grass and food sources at aerodromes.

131. Pest destruction agencies usually also cater for smaller species of birds, generally in and around buildings.

Department of Conservation (DOC)

132. The local DOC is charged with managing the wildlife in its region. Staff authorise the disturbing or killing of problem protected species and provide information about specific

species (e.g., their habitat, food sources, populations and colony sites and control methods). Staff can also help with ecological studies.

133. DOC has worked with aerodrome operators to reduce a problem species, the black-backed gull, which in turn helped to re-establish native birds in the general area.

Interested parties

134. Other interested parties are often willing to help if it will be mutually beneficial. For example, Birds New Zealand and the Royal Forest and Bird Society may help with ecological surveys, species identification and population counts and universities may help with researching birds, animal behaviour and soil, crop or pasture management.

135. Graduate students may be undertaking independent field research that is relevant to the wildlife hazard management programme and may be willing to share information or trial new techniques with aerodrome operators.

Communication and the media

136. Communication plays a big part in any wildlife hazard management programme. This is particularly important when an aerodrome operator is about to implement a control programme that extends beyond the aerodrome's boundaries and is aimed at reducing the population of a particular species.

137. The public may not view an active reduction in bird numbers favourably. Therefore, an aerodrome operator should consider how to communicate the activity. To help minimise negative publicity, an aerodrome operator could ~~you~~ emphasise the programme's safety aspects and the alternative measures that have been taken.

Further resources

Websites and training material

Home page | New Zealand Birds Online

New Zealand Bird Atlas - Discover a new world of birding...

The Field Guide to the Birds of New Zealand by Barrie Heather - Penguin Books New Zealand

The Hand Guide to the Birds of New Zealand by Barrie Heather - Penguin Books New Zealand

Merlin Bird ID – Free, instant bird identification help and guide for thousands of birds – Identify the birds you see (available for use in New Zealand)

eBird Photo + Sound Quiz

Bird Identification: Online courses

Publications

Civil Aviation Safety Authority (Australia)

advisory-circular-139.c-16-wildlife-hazard-management.pdf

Appendix 1

Specific species – descriptions and control methods

Note: *There are a number of other resources available, as detailed in the Further Resources section, which provide comprehensive and up-to-date information and may be more useful for operators.*

The following summaries outline the status (protected, unprotected or game bird) of the 16 problem bird species and describe the methods for controlling them. The species are the:

- Australasian harrier hawk – *Circus approximans* Peale
- Australian magpie – *Gymnorhina tibicen*
- Black-billed gull – *Chroicocephalus bulleri*
- Canada goose – *Branta canadensis*
- Eurasian skylark – *Alauda arvensis* Linnaeus
- European starling - *Sturnus vulgaris Linnaeus*
- Finch (chaffinch, greenfinch, goldfinch and yellowhammer) – *Chloris chloris*
- House sparrow – *Passer domesticus*
- Mallard duck – *Anas platyrhynchos Linnaeus*
- Paradise shelduck – *Tadorna variegata*
- Red-billed gull – *Chroicocephalus novaehollandiae*
- Rock pigeon – *Columba livia* Gmelin
- Southern black-backed gull – *Larus dominicanus* Lichtenstein
- South Island pied oystercatcher – *Haematopus finschi* Martens
- Spur-winged plover – *Vanellus miles*
- Welcome Swallow – *Hirundo neoxena* Gould

Australasian harrier hawk

Scientific name

Circus approximans Peale

Protection status

Schedule 3 – Wildlife that may be hunted or killed subject to Ministers notification.

Methods for controlling species

- Use short grass management technique.
- Use pyrotechnics.

Australian magpie

Scientific name

Gymnorhina tibicen

Protection status

Schedule 5 – Wildlife not protected.

Methods for controlling species

- Use long grass management technique.
- Use vermicide and pesticide on manoeuvring area grassed surfaces.
- Use pyrotechnics and live shells.
- Trap birds (by cage) for relocation to other areas.

Black-billed gull

Scientific name

Chroicocephalus bulleri

Protection status

Protected.

Methods for controlling species

- Use long grass management technique.
- Use vermicide and pesticide on manoeuvring area grassed surfaces.
- Use pyrotechnics.
- Gain local council support for managing refuse sites and playing fields to minimise food sources.

Canada goose

Scientific name

Branta canadensis

Protection status

Schedule 5 – Wildlife not protected.

Methods for controlling species

- Use vermicide and pesticide on manoeuvring area grassed surfaces.
- Use pyrotechnics and live shells.
- Shoot flocks in mass during moult to reduce population.

Note: *It is important to disturb the birds as soon as they appear, so they do not establish a tradition of feeding, nesting etc.*

Eurasian skylark

Scientific name

Alauda arvensis Linnaeus

Protection status

Schedule 5 – Wildlife not protected.

Methods for controlling species

- Airfield grass and weed maintenance programmes.
    - Frequent mowing reducing seed head growth.
    - Frequent weed spraying and weed-eating.
- Utilisation of mowers with rollers or rolling problematic areas separately (heavy rollers crush skylark eggs at ground level).
- Introducing predators (real or mock up), i.e. dogs, swamp harriers.
- Frequent but random use of gas cannons and/or pyrotechnics.

European starling

Scientific name

Sturnus vulgaris Linnaeus

Protection status

Schedule 5 – Wildlife not protected.

Methods for controlling species

- Use long grass management technique (i.e., grow grass 20 cm or longer).
- Use vermicide and pesticides on manoeuvring area grassed surfaces.
- Use pyrotechnics and occasional live shells.
- Place netting over holes in buildings.
- Use moving visual deterrents (e.g., kites, tinsel or metal cat faces hung in trees).
- Poison flocks' feed.

Finch (chaffinch, greenfinch, goldfinch and yellowhammer)

Scientific name

Chloris chloris

Protection status

Schedule 5 – Wildlife not protected.

Methods for controlling species

- Use short grass management technique.
- Use vermicide and pesticide on manoeuvring area grassed surfaces.
- Use pyrotechnics and live shells.
- Shoot flocks in mass to reduce population.

House sparrow

Scientific name

Passer domesticus

Protection status

Schedule 5 – Wildlife not protected.

Methods for controlling species

- Use short grass management technique; select grass type carefully.
- Use vermicide and pesticides on manoeuvring area grassed surfaces.
- Use pyrotechnics and live shells.
- Place netting over holes in buildings.
- Use moving visual deterrents (e.g., kites, tinsel or metal cat faces hung in trees).
- Poison flocks' feed.

Mallard duck

Scientific name

Anas platyrhynchos Linnaeus

Protection status

Schedule 1 – Wildlife declared to be game.

Methods for controlling species

- Use short grass management technique during breeding season.
- Use vermicide and pesticide on manoeuvring area grassed surfaces.
- Use pyrotechnics and live shells.

Paradise shelduck

Scientific name

Tadorna variegata

Protection status

Schedule 1 – Wildlife declared to be game.

Methods for controlling species

- Use long grass management technique and careful selection of grass type.
- Use vermicide and pesticide on manoeuvring area grassed surfaces.
- Use pyrotechnics and live shells.
- Destroy flocks during the moult to maximise population reduction.

Red-billed gull

Scientific name

Chroicocephalus novaehollandiae

Protection status

Protected.

Methods for controlling species

- Use long grass management technique.
- Use vermicide and pesticide on manoeuvring area grassed surfaces.
- Use pyrotechnics.
- Gain local council support for managing refuse sites and playing fields to minimise food sources.

Rock pigeon

Scientific name

Columba livia Gmelin

Protection status

Schedule 5 – Wildlife not protected.

Methods for controlling species

- Use short grass management technique and careful selection of grass type.
- Use vermicide on manoeuvring area grassed surfaces.
- Use pyrotechnics and live shells.
- Poison flocks (with Alphachloralose) by baiting feed.
- Place wire spikes on ledges and netting over holes in buildings.

Note: *Pigeons are sometimes kept for racing. If they are based near the aerodrome, they could cause problems. Liaise with pigeon owners to encourage them to exercise the birds when the aerodrome is least busy. Seek local council assistance if necessary.*

Southern black-back gull

Scientific name

Larus dominicanus Lichtenstein

Protection status

Schedule 5 – Wildlife not protected.

Methods for controlling species

- Use long grass management technique.
- Use vermicide and pesticide on manoeuvring area grassed surfaces.
- Use pyrotechnics and occasional live shells.
- Use wires on flat roof surfaces.
- Gain local council support for managing refuse sites and playing fields to minimise food sources.
- Destroy eggs by injecting them with formaldehyde.
- Poison (with Alphachloralose) colonies and juveniles known to cross flight paths.

South Island pied oystercatcher

Scientific name

Haematopus finschi Martens

Protection status

Protected.

Methods for controlling species

- Use long grass management technique.
- Use vermicide and pesticide on manoeuvring area grassed surfaces.
- Use pyrotechnics.

Spur-winged plover

Scientific name

Vanellus miles

Protection status

Schedule 5 – Wildlife not protected.

Methods for controlling species

- Use long grass management technique.
- Use vermicide and pesticides on manoeuvring area grassed surfaces.
- Use pyrotechnics and occasional live shells.
- Destroy eggs and nests during breeding season.
- Shoot flocks from helicopters.

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Welcome Swallow

Scientific name

Hirundo neoxena Gould

Protection status

Protected.

Methods for controlling species

- Insect control - utilisation of insecticide programmes i.e monitoring/insecticide use.
- Dethatching of airfield grass areas/ problematic areas (removed organic matter and moisture mitigating insect breeding environments).
- Airfield drainage improvements.
- Elimination of roosting areas or the use of bird spikes or gels i.e trees, rafters, ledges, buildings.
- Introducing predators (real or mock up) i.e dogs, swamp harrier.

Frequent but sparing use of gas cannons and/ or pyrotechnic.