104 Ryans Road Wildlife Hazard Management Plan

Prepared for

Carter Group Limited

November 2025

D
R
A
F
T

PATTLE DELAMORE PARTNERS LTD
Level 2, 109 Fanshawe Street,
Auckland Central 1010
PO Box 9528, Auckland 1149, New Zealand

Tel +64 9 **523 6900**
Web www.pdp.co.nz

solutions for your environment

Quality Control Sheet

TITLE	104 Ryans Road Wildlife Hazard Management Plan
CLIENT	Carter Group Limited
ISSUE DATE	19 November 2025
JOB REFERENCE	C052850003

DRAFT

Revision History

REV	Date	Status/Purpose	Prepared By	Reviewed by	Approved
1	24/10/2025	Draft	Rhiannon Warren	Lizzie Civil	Jarred Arthur
2	19/11/2025	Final Draft	Lizzie Civil	Jarred Arthur	Jarred Arthur

DOCUMENT CONTRIBUTORS

Prepared by

SIGNATURE

Rhiannon Warren

Reviewed by

SIGNATURE

Lizzie Civil

Approved by

Jarred Arthur

Limitations:

This report has been prepared by Pattle Delamore Partners Limited (PDP) on the basis of information provided by Carter Group Limited (LTD) and others (not directly contracted by PDP for the work), including Christchurch International Airport (CIAL). PDP has not independently verified the provided information and has relied upon it being accurate and sufficient for use by PDP in preparing the report. PDP accepts no responsibility for errors or omissions in, or the currency or sufficiency of, the provided information.

This report has been prepared by PDP on the specific instructions of Carter Group Limited for the limited purposes described in the report. PDP accepts no liability if the report is used for a different purpose or if it is used or relied on by any other person. Any such use or reliance will be solely at their own risk.

Table of Contents

SECTION		PAGE
1.0	Background	1
1.1	Introduction	1
1.2	The Site	2
2.0	Legislative and Policy Context	2
3.0	Christchurch Airport Wildlife Hazard Management Plan	4
3.1	Objectives	4
3.2	Christchurch Airport Wildlife Strikes	4
3.3	Bird Species Risk Profiles	6
4.0	104 Ryans Road Bird Strike Assessment	7
4.1	Current Site Habitat and Information	7
4.2	Bird Strike Risk Post Development	8
4.3	Site Habitat Risks	9
4.4	Avifauna Strike Risk	11
4.5	Integrated CIAL and Ryans Road Risk Matrix	12
5.0	Wildlife Hazard Management Plan	14
5.1	Goals and Objectives	14
5.2	Implementation	14
6.0	Wildlife Management Measures	16
6.1	Passive Wildlife Management	16
6.2	Active Management	19
6.3	Management of Extreme to Medium Risk Species	20
7.0	Wildlife Procedures	21
7.1	Pre-construction	21
7.2	During Construction	21
7.3	Post Construction	22
7.4	Escalation Procedures	23
7.5	Monitoring Risk to Inform Management Procedures	24
8.0	Wildlife Hazard Management Plan Monitoring & Review	25
8.1	Overview	25
8.2	Reporting and On-going Site Management	26
References		27

Table of Figures

Figure 1: Significant Wildlife Habitats Surrounding Christchurch International Airport B-1

Table of Tables

Table 1: Annual CIAL Bird Strikes, 2019-2024 5

Table 2: PDP (2025) Spring Bird Count Data Undertaken 27 November (native species have been highlighted in bold) 7

Table 3: High Risk Site Habitat Types, Attractancy and Impact 10

Table 4: CIAL Bird Risk Matrix 2022[1, 2] 13

Table 5: Roles & responsibilities in implementing WHMP 15

Table 6: Passive Management Pre- and Post-Development 16

Table 7: Active Management Techniques for High to Medium Risk Species 20

Appendices

Appendix A: Prioritised Species Management Table

Appendix B: Figure

1.0 Background

1.1 Introduction

This Wildlife Hazard Management Plan (WHMP) has been prepared for Carter Group Limited (CGL) to support the proposed industrial development at 104 Ryans Road and 20 Grays Road, Yaldhurst, Christchurch (the site). The site is located approximately 170 m south of the threshold of Christchurch International Airport Limited (CIAL) runway 02, within the 3 km bird strike management zone defined by the Christchurch City District Plan (CCDP) (Figure 1, Appendix B).

The environment surrounding CIAL has undergone major changes in the past five years. What once was farmland has been developed into industrial, residential and commercial sites. CIAL has communicated that they have seen a rise in bird strike risk due to environmental changes. Starling, rock pigeon and southern black back gull numbers have increased, along with the number of bird strike incidents. It is essential for sites surrounding CIAL to have a holistic and effective WHMP that aligns closely with the CIAL WHMP to ensure programme consistency and effective and efficient management of bird strike risks.

The development plans for the proposed industrial site have been prepared by Capture Land Development Consultants. These are generally consistent with the Industrial General Zone provisions of the CCDP in terms of activity types, built form, and relevant standards. The objective of this WHMP is to manage potential wildlife hazards with an emphasis on bird strike risk associated with aircraft operations relating to CIAL, in accordance with the requirements of Civil Aviation Authority (CAA) Rule (CAR) Part 139.71 and consistent with the content in the CIAL WHMP.

This WHMP builds on the findings of the following documents provided by PDP:

- Bird Strike Assessment (BSA) Report (PDP, 2025);
- Lighting Management for Aerial Fauna Memorandum (PDP, 2025); and,
- Three Waters Servicing Report for Ryans Road Development (PDP, 2025).

Together, these technical assessments concluded that, while the 104 Ryans Road development will reduce overall bird activity due to habitat loss and increased human presence, some risk will remain, particularly from species such as spur-winged plovers, southern black-backed gulls, red-billed gulls, and rock pigeons.

Accordingly, this WHMP outlines management, mitigation, monitoring, and communication procedures to ensure that these potential wildlife hazards are managed effectively throughout the construction, and operation and maintenance phases of the site.

Further refinement of the conditions contained in this WHMP may be made in consultation with CIAL/Avisure and CCC as the WHMP is developed.

1.2 The Site

The 55.5 ha site is located within the Low Plains Ecological District of the Canterbury Plains Ecological Region and situated in the Rural Urban Fringe Zone of the CCDP. The surrounding environment includes pastoral land, golf courses, drainage features, and artificial water bodies such as stormwater basins. Waimakariri River is approximately 6 km north, and the coastline approximately 20 km to the east. These provide foraging habitat for several bird species that may transit near the site (see Figure 1, Appendix B).

The site currently contains abundant vegetation including rank grass, shrubs and larger trees, with multiple old, abandoned buildings. The property at 104 Ryans Road will be developed into an industrial site with the establishment of logistics, warehousing, light manufacturing, and other airport-related businesses.

Site development will include habitat changes (i.e., the development of buildings and infrastructure) that will influence wildlife behaviour and require wildlife hazard management. The CCDP contains bird strike management provisions within 3 km of the thresholds of runways. Within the bird strike management areas, land use activities (e.g., stormwater basins) that may attract birds are restricted and/or require specific bird strike risk management techniques. This will require the applicant to work with this WHMP in consultation with CIAL to control and manage the threat of bird strikes.

PDP ecologists conducted an onsite assessment on 27 November 2024 to inform the BSA Report (PDP,2025). Assessments of bird activity, bird species and habitats were conducted to determine bird strike risks and assess if native and endemic species may breed on site. PDP conducted five-minute bird counts in 15 locations to assess species numbers, behaviour and flight path patterns (PDP, 2025).

2.0 Legislative and Policy Context

Civil Aviation Authority

In 1993, the CAA of New Zealand (NZ) introduced the operating rules for certified airports under the CAR. Part of the operating rules recognise the need for airport operators to manage wildlife, where any wildlife presents a hazard to aircraft operations at their aerodrome. CAR 139.71 requires airports to establish and utilise a WHMP to manage potential wildlife hazards to airport operations, in areas within their authority (CAA, 2024).

CAA Advisory Circular (AC) 139.16 describes information about standards, practices and procedures found to be an acceptable means of compliance for CAR 139.71 Wildlife Hazard Management (WHM) in relation to the control of wildlife hazards at aerodromes. AC 139.16 does not dictate how to control wildlife hazards, but it presents information and methods to assist aerodrome operators and local territorial authorities in creating or enhancing a WHMP. An effective WHMP can significantly reduce the costs, risks and damages associated with airport operations and wildlife strikes as well as protect and enhance New Zealand's biodiversity (CAA, 2024).

The western portion of 104 Ryans Road lies within the Runway End Protection Area (REPA) and Protection Surfaces, placing it in a high risk area for potential bird strikes, and thus requiring strict compliance with CIAL and CAA rules.

International Civil Aviation Organisation

As a signatory to the Convention on International Civil Aviation (1944), New Zealand implements International Civil Aviation Organisation (ICAO) standards through CAA regulations. Annex 14 to the Convention directs airport operators and nearby land users to adopt measures that minimise the likelihood of collisions between wildlife and aircraft, and to prevent land uses that may attract birds within and near aerodromes.

New Zealand and Australian Wildlife Hazard Management Groups

The NZ Aviation Wildlife Hazard Group (NZAWHG) and Australasian Aviation Wildlife Hazard Group (AAWHG) are nationally formed bodies that are recognised by the CAA. Collectively, they promote and enhance aviation safety through best practice. Each group has adopted ICAO's best practice standard to establish 3 km, 8 km and 13 km WHM Zones around aerodromes, within which land use and environmental changes must be assessed for the potential to increase bird strike risk (NZAWHG, 2022). The CIAL WHMP (2024) applies these zones locally, supported by CCDP rules and safeguarding frameworks.

Christchurch City District Plan

The CCDP includes bird strike management provisions within a 3 km buffer of the runway thresholds at CIAL. The CCDP regulates land-use activities within this buffer that may increase bird attractancy and require bird strike risk management. These rules apply to areas surrounding CIAL and include controls, such as for stormwater basin design and light spill restrictions within 500 m of the runway thresholds.

3.0 Christchurch Airport Wildlife Hazard Management Plan

3.1 Objectives

The CIAL WHMP manages aviation bird strike risk according to the following objectives (CIAL WHMP, 2022):

- *Deter hazardous bird presence in operational areas and encourage them to alternative sites.*
- *Target high and moderate risk species and habitats that primarily support them, both on and off the airport.*
- *Ensure compliance with all relevant airport operational and environmental legislation and regulations.*
- *Ensure that adequate systems are in place to define roles, responsibilities, and procedures for managing wildlife risks.*
- *Define the methods by which wildlife hazards are managed by maintaining an adequate supply of resources for dispersing and controlling wildlife.*
- *Develop performance goals and targets for management of wildlife issues and outline how these will be assessed and reviewed.*
- *Ensure CIAL personnel are trained to a high standard so to preform wildlife management safely and effectively.*

3.2 Christchurch Airport Wildlife Strikes

In 2024, there were an average of five bird strikes per 10,000 aircraft movements at CIAL (upkeeping under five strikes per 10,000 movements is a CAA Bird Incident Rate Reporting standard (CAA, 2022). From 2019-2024, CIAL strikes consisted of 50-70% small avian species, 5-30% medium species, and 2-9% large species annually. In 2024, bird strikes consisted of 60% small species, 20% medium species, and 9% large species (Table 1).

Table 1: Annual CIAL Bird Strikes, 2019-2024			
Year	**Total Number of Strikes**	**Number of Strikes per 10,000 Movements**	**Bird Species**
2024	50	5.0	60% small, European starling size and below. 20% medium, spur-wing plover rock pigeon. 9% large southern black backed gull, swamp harrier. Remainder unknown.
2023	44	4.0	50% small, European starling size and below. 30% medium, spur-wing plover, rock pigeon, black billed gull, South Island pied oystercatcher. 10% large southern black backed gull, swamp harrier, mallard duck. 5% Rabbit. Remainder unknown.
2022	43	4.1	50% small, European starling size and below. 15% medium, spur-wing plover, rock pigeon. 8% large southern black backed gull. Remainder unknown.
2021	25	3.4	60% small, European starling size and below. 5% medium, spur-wing plover, rock pigeon. 0% large. 2% Rabbit. Remainder unknown.
2020	36	6.3	70% small, European starling size and below. 10% medium, spur-wing plover, rock pigeon, South Island pied oystercatcher. 2% large Canadian goose. Remainder unknown.
2019	34	3.3	Predominantly house sparrows, mix of other small birds and southern black backed gull.

3.3 Bird Species Risk Profiles

3.3.1 CIAL Extreme to High Risk Species

Common species at CIAL are identified in the CIAL Bird Strike Risk Matrix and classified as extreme, high, medium and low risk (Table 4 below).

As described in Section 3.1 the CIAL WHMP focuses on high risk species as a priority for their wildlife management. Two species of significant risk to CIAL that were identified onsite are the swamp harrier and rock pigeon. The southern black backed gull is also a significant risk, and whilst they were not present onsite during the PDP BSA assessment (PDP, 2025) they potentially could be once it is developed for industrial purposes. This is because the species uses large roof surfaces for roosting and nesting (unless management measures prevent this).

Swamp harrier are territorial birds that have home ranges of up to 900 ha in the breeding season (NZ Birds Online, 2024). They are intelligent birds that become accustomed to aviation and aircraft movements. It is NZAWHG's best practice to deter swamp harrier, when necessary, but never remove them. If individuals that occupy the territory are removed, the likelihood of another swamp harrier taking over the territory is likely, increasing the risk of strike due to its unfamiliarity with the operational environment.

Rock pigeon movements around the CIAL airspace are becoming more of a concern especially during agricultural harvest time. CIAL classify rock pigeons as an extreme risk species. They are medium-sized birds; however, their abundant flocking characteristics categorise them as a higher risk on the NZAWHG risk matrix (Table 4). The CIAL wildlife management team are aware that rock pigeon movements are taking place from CIAL to Riccarton Racecourse southeast of the site and to various agricultural land around CIAL. During the PDP site visit, ecologists witnessed two rock pigeons fly from the site encountering a near-miss with a large aircraft approaching for landing.

The southern black backed gull is also a problematic bird to CIAL. They can be abundant, forming large flocks and congregate where food scraps, offal and other organic waste can be obtained. They breed prolifically and can weigh up to 1.5 kg. The species nest in masses of grass, sticks, scrapes in the ground or on roof tops in October to January (NZ Birds Online, 2024).

3.3.2 CIAL Medium Risk Species

The spur-winged plover is the only species of medium risk to CIAL. This species was not seen during the PDP BSA site visit (PDP, 2025); however, it is highly likely to visit the site especially during paddock ploughing or grazing as they prefer short grass. Due to the spur-wing plovers aggressive and territorial behaviour, and excessive breeding characteristics, they cause a higher strike risk.

3.3.3 CIAL Low Risk Species

CIAL low risk species are generally small bird species. These species constitute 50-70% of their strikes (Table 1). However, due to their smaller size, they cause little to no damage to aircraft and are categorised as low risk within the CIAL risk matrix. Small species include those counted onsite during the PDP BSA assessment (PDP, 2025) such as finch species, starling and black bird. The house sparrow and yellow hammer are also categorised as low to medium risk.

4.0 104 Ryans Road Bird Strike Assessment

4.1 Current Site Habitat and Information

Field surveys conducted by PDP (2025) identified 14 bird species using or transiting the site (Table 2). A desktop review of eBird records shows 33 species recorded within the vicinity of the site.

Table 2: PDP (2025) Spring Bird Count Data Undertaken 27 November (native species have been highlighted in bold)

Common Name	Species	No. Observed
Common pheasant	*Phasianus colchicus Linnaeus*	3
Common starling	*Sturnus vulgaris*	19
Eurasian blackbird	*Turdus merula*	1
Eurasian skylark	*Alauda arvensis Linnaeus*	102
European goldfinch	*Carduelis carduelis*	31
Finch spp.	*Not determined*	20
House sparrow	*Passer domesticus*	74
Long-tailed cuckoo	*Eudynamys taitensis*	1
Pūkeko	*Porphyrio melanotus Temminck*	1
Rock pigeon	*Columba livia Gmelin*	21
Silvereye	*Zosterops lateralis*	1
South Island pied oystercatcher	*Haematopus finschi*	1
Swamp harrier	*Circus approximans Peale*	2
Yellowhammer	*Emberiza citrinella*	7
Overall Total		**284**

The area surrounding the old, abandoned buildings at 104 Ryans Road provide extensive habitat for avifauna, such as for roosting, nesting, breeding, and foraging. Active common starling nests were found in the walls of several buildings. Multiple rock pigeon were observed roosting on the rooftops, eaves and rafters. Extensive unmaintained rank grass (seeding) was present over much of the site. Two silos had large numbers of finch species roosting upon them. Large mature tree species were also present at the site. It is understood that trees will be removed, and all old buildings and silos will be demolished, in preparation for site development.

The site consists of mostly open rank pasture grass species commonly found in exotic pasture communities. These include cocksfoot (*Dactylis glomerata*) and tall fescue (*Lolium arundinaceum*). The site is overgrown with exotic plant species, consisting of vines (mallow *Malva* spp., European ash *Fraxinus excelsior,* English Ivy *Hedera helix*), shrubs (tree privet *Ligustrum lucidum,* Elder *Sambucunigra spp.),* hydrangea (*Hydrangea* spp.), wild ginger spp., weeds (dandelion *Taraxacum* spp., dock *Rumex* spp.) and taller vegetation, bamboo and pines. These flora species provide seed, flower and nectar food sources for insects and birds, attracting them to the site.

Rank grass was present along the borders of the fields adjacent to the hedgerows. Rank grass and hedges provide nesting and foraging habitat for species, such as Eurasian skylark and spur-winged plover. Additionally, a pine tree row was observed at the centre of the site, and several small poplar and other tree species were dispersed along the field edges. Trees provide nesting, foraging and roosting habitat for avifauna. It is understood the trees will be cleared prior to any site development.

4.2 Bird Strike Risk Post Development

Overall bird numbers are expected to decline post-development due to the removal of the habitat features mentioned in Section 1.4.1 of the 2025 PDP BSA. Old buildings and trees will be removed, and rank grass will be replaced with warehouses, logistics facilities, and planted and landscaped areas. Despite a predicted reduction in current bird populations, local shifts towards urban-tolerant species may occur and still present bird strike risk. Collaboration with CIAL is necessary to address and mitigate these risks.

The BSA (PDP, 2025) concluded that the development has the likelihood of decreasing overall bird activity with a reduction in grass, tree and derelict habitats. However, PDP identified two activities with potential to increase bird attractancy:

- There is potential that urban bird species activity will increase with:
  - the development of industrial buildings, due to roof tops, with potential roosting and nesting area for spur-winged plovers, rock pigeons and gull species; and
  - lighting impacts, which firstly may increase insect numbers (resulting in higher attractancy to insectivorous birds), and secondly may alter nocturnal activity and migratory species routes.
- There is also potential for attraction to the site's stormwater facilities if/when standing water is present during rare and extreme weather events.

Both of these risks can be managed through the utilisation of this WHMP.

4.3 Site Habitat Risks

PDP assessed the current, during construction and post-development bird strike risks within the PDP BSA (2025). The habitats identified in Table 3 below have the potential to attract extreme to high risk species to the site post-development and during the construction phase, thus causing avifauna movements to and from the site to other areas in the vicinity of CIAL.

Table 3: High Risk Site Habitat Types, Attractancy and Impact			
Area	**Habitat Type**	**Attractancy**	**Impact**
Grassed areas	Unmaintained open grassland Groomed Grass	Seeded grass attracts foraging seed-eating birds such as finch spp., Eurasian skylark, European starling. It also attracts scavenging birds like the swamp harrier. Groomed grass lower than 200 mm attracts ground insects, foraging birds such as European starling, spur-winged plover and ground loafing birds such as spur-winged plover, rock pigeon and southern black backed gull.	The development of the site will reduce the overall unmaintained grass area and may reduce seed eating bird activity but increase ground loafing bird activity especially if grass is well groomed. This may increase over all bird strike risk if not managed as ground roosting birds are larger than seed eating birds.
Open substrate and stockpiles	Exposed earth	Attracts ground insect foraging and loafing birds as described above.	Open substrate stockpile availability during construction will increase overall bird strike risk if not managed appropriately.
Tarmac / concreted areas	Flat areas of footpaths/ walkways or roads	Attracts loafing birds such as South Island pied oystercatcher, gull spp., rock pigeon and Eurasian skylark.	The removal of open grassland and the creation of flat concreted areas post construction may increase loafing bird activity but decrease seed-eating bird activity. However, activity will be reduced with high daily human presence.
Drains, trenching and stormwater	Ponded water	Attracts gull spp., waterfowl spp., and pūkeko.	The creation of ground depressions and water reservoirs during construction and post development may attract waterfowl. However, site soils are expected to be fast draining, and stormwater design will only hold minimal water in rare and extreme weather events.

Table 3: High Risk Site Habitat Types, Attractancy and Impact			
Area	**Habitat Type**	**Attractancy**	**Impact**
Buildings and infrastructure	Flat rooftops, internal rafters in buildings	Attracts species like southern black backed gull, house sparrow, European starling and rock pigeon to roost and nest.	May increase bird loafing and nesting activity on site post construction but reduce feeding activity from the former grassland at the site.
Buildings and infrastructure	Habitat influenced by lighting	White and blue lighting increases insect attraction and abundance and can increase bird numbers. Disrupts avian circadian rhythms, increases sky glow, affecting nocturnal activity and migratory species routes.	White and blue lighting on site could increase insect and bird abundance at nighttime increasing bird strike risk.
Vegetation	Trees, shrubs, (exotic and native), gardens and other ornamental vegetation	Vegetation creates breeding, roosting and foraging areas for all avifauna.	Vegetation attracting birds to breed, feed and roost will increase bird abundance and activity on site and increase the sites bird strike risk impact. However, overall tree count appears to be less post-development than pre-development, and planting plans are designed to have low attractance, reducing overall risk.

4.4 Avifauna Strike Risk

Avifauna species numbers change seasonally depending on many factors including migration times, and food availability around agriculture and farming. Species counted by PDP (2025) are a good indication of a site's bird community, but this may vary between seasons and as agricultural practices and activities change. We know that the species present at CIAL will also be present on the site and that CIAL data covers the full year. This gives us a good understanding of high strike risk species using CIAL strike data and their risk matrix presented in Table 4.

CIAL identifies the following species to be high risk in times of stock, cropping activities and developments: rock pigeons, southern black backed gull, Spur-winged plover, Canada geese, mallard duck and paradise duck, finch species, yellowhammer, starling, skylark, sparrow and South Island pied oystercatcher.

CCC has expressed concerns regarding specific bird strike risk to Garden City Helicopters. Due to the downward propeller wash of helicopters, birds do not cause risk to helicopters the same way as aeroplanes. The CAA suggests the relatively low airspeed, the large amount of downwash air, and the noise of helicopters results in lower risk of bird strike occurring, despite the sharing of airspace between helicopters and birds (CAA, n.d.) This is further supported by CAA data gathered from their online database that indicates bird incidents (strikes and near miss) involving helicopters at CIAL from 2013-2025 occurred two times in comparison with bird incidents with aeroplanes (2712 times). Therefore, helicopter strikes make up 0.07% of bird incidents in relation to any aircraft. Across the country, bird incidents with helicopters occurred 94 times over the same period in comparison with aeroplanes (17,261), making up 0.49% of bird incidents in relation to all aircraft.

Please note bird incidents publicly listed by the CAA are both near miss and strike events. Strike rates alone are likely to be a lot lower than overall incident rates.

4.5 Integrated CIAL and Ryans Road Risk Matrix

The AAWHG and NZAWHG share a standardised risk matrix that quantifies each species risk to aviation at each respective aerodrome. Risk is determined based on the consequence and likelihood of a strike event occurring. Below is the most recent CIAL 2022 Bird Risk Matrix (Table 4).

The risk assessment is based on the NZ Risk Assessment Model developed by the AAWHG and the NZAWHG. The model is applied to each bird species, using the likelihood of a strike occurring and the consequence associated with a strike. More specifically:

- Likelihood - the likelihood of the species being in the area (abundance), which is determined using bird counts in differing habitats as well as bird strike statistics; and,
- Consequence - the consequent damage of each species (low to extreme), this is based on bird species weights, behaviour and flocking characteristics.

For example, a large bird that is common in an area (high strike likelihood) will have a high strike risk.

Table 4: CIAL Bird Risk Matrix 2022[1, 2]

		Consequence				
		Negligible (0-4)	**Minor (8-20)**	**Moderate (21-33)**	**Significant (34-46)**	**Extreme (47+)**
Likelihood	Very Likely (5)	**House sparrow**			Southern black-backed gull **Swamp harrier** **Rock pigeon**	
	Likely (4)	**Yellowhammer**		Spur-winged plover		
	Possible (3)	**Greenfinch** **Goldfinch** **Starling** Banded Dotterel				
	Unlikely (2)		Little owl			
	Very Unlikely (1)	**Blackbird** Black-billed gull Thrush	Red-billed gull			

Low Risk: no further action beyond current management is required

Medium Risk: review current management options for any additional actions

High Risk: take action to reduce risk

Extreme Risk: take immediate action to reduce risk

[1] CIAL use majority strike data to inform their Risk Matrix. Bird species such as Canada geese can potentially present an extreme risk to aircraft given their size and flocking characteristics, however they are not seen on the airport, nor have they caused a strike event. CIAL actively manage Canada geese, however they are excluded from CIAL's Risk Matrix, to eliminate unnecessary concern to airlines and the CAA.

[2] The CIAL 2022 Bird Risk Matrix layout differs from the NZAWHG Bird Risk Matrix, the layout has been rearranged but this does not affect the general risk categorisations between the two matrix tables. However, the adopted model classifies the high end of the matrix with both an extreme and high risk classification not only high as seen in the CIAL WHMP.

5.0 Wildlife Hazard Management Plan

5.1 Goals and Objectives

The goal of this WHMP is to proactively manage avian populations and reduce the attractiveness of the site at 104 Ryans Road/20 Grays Road and its surrounds to birds. This will reduce the risk of bird strikes affecting aircraft, airport operations, and passenger safety at CIAL.

The objectives of the WHMP are to:

- Inform site design to manage wildlife hazard risks.
- Build upon PDP's initial BSA by assessing on-site and off-site wildlife hazards, and analysing strike data and seasonal activity patterns.
- Develop targeted management strategies to mitigate identified wildlife risks, post development and during construction
- Establish clear monitoring, review, reporting and communication frameworks.
- Define responsibilities and coordination mechanisms between site personnel, developers, and CIAL.
- Specify required training and resourcing for personnel involved in implementing the WHMP.
- Integrate the WHMP with CIAL's broader risk management framework in accordance with CAA Part 139.71.

The BSA (PDP, 2025) identified residual risks that are likely to result from the development of the site associated with urban-tolerant species (e.g. spur-winged plover, southern black-backed gull, rock pigeon) that may exploit industrial rooftops and stormwater features. This WHMP provides mitigation and monitoring measures (Sections 6-7) for the management of the 104 Ryans Road/20 Grays Road site to address these risks collaboratively with CIAL.

5.2 Implementation

5.2.1 Roles & Responsibilities

This WHMP will be owned by the Site Developers in the first instance and transferred to individual lot owners, overseen by a Site Manager once site lots are sold. Responsibility in Table 5 below should be understood and undertaken by all responsible parties.

Effective implementation of this WHMP requires the clear allocation of roles, routine training, and strong communication between the Site Developer, Site Manager and CIAL.

To ensure the WHMP is actively implemented, the Site Developer and Site Manager will oversee compliance with all mitigation measures. Non-compliance or failure to follow procedures will be escalated to the Site Developer or Site Manager, who will coordinate corrective actions. Periodic reviews will assess whether management measures are being followed and are effective, with adjustments made as necessary to maintain alignment with CIAL guidelines and regulatory requirements.

All personnel involved in the Ryan Road development project and the ongoing operation of the site following development will receive training on wildlife hazard identification, reporting procedures, and mitigation measures. Training will be included in staff inductions and refreshed as required, with staff briefed on the importance of reporting any sightings of extreme to high risk species. This ensures that all team members are actively contributing to the effective implementation of the WHMP.

The WHMP Coordinator (Site Developer or Site Manager) will maintain clear communication pathways with CIAL, CCC, and other relevant stakeholders. Reports on monitoring results, mitigation actions, and any incidents will be shared according to agreed timelines. This coordination ensures transparency, supports decision-making, and maintains alignment with broader aviation safety objectives.

Table 5: Roles & responsibilities in implementing WHMP

Role	Responsibility
Site Developer/WHMP Coordinator (during subdivision prior to individual lot sale)	Implementation and compliance of the WHMP protocols such as site bird count observation and reporting. Fund mitigation and management activities in the development and subdivision phase prior to the sale of individual lots. Pass WHMP responsibility to Site Manager one individual lots are sold.
Site Manager/ WHMP Coordinator (following individual lot sale)	Implementation and compliance of the WHMP. Following post-construction operational phase WHMP protocols such as on site bird observations and reporting.
Contractors	Understand and comply with details specified within the WHMP – pre and post construction protocols.
Individual lot owners	Understand and comply with details specified within the WHMP – post construction protocols.
CIAL Wildlife Team	Provide technical support and coordinate problematic dispersal

Table 5: Roles & responsibilities in implementing WHMP	
Role	**Responsibility**
Ecological Consultant	Conduct pre-construction bird monitoring and reporting for the Site Manager as well as annual monitoring and reporting for 5 years following construction. Additional monitoring and reporting on request.

6.0 Wildlife Management Measures

6.1 Passive Wildlife Management

Passive management techniques aim to remove or reduce the number of hazardous avian and mammalian species pre and post development, by altering site conditions, making the site less attractive to birds and mammals.

Passive management techniques will be the responsibility of the Site Manager. Table 6 below outlines the pre- and post-development passive management measures to be applied at the site. See Table 3 for an explanation of why the below habitat types pose risk.

Table 6: Passive Management Pre- and Post-Development	
Type of Habitat	**Pre-development, during and post-development habitat management**
Grass and open substrate	**Pre-development and during development** Where possible, avoid earthworks between late July and mid-February, as disturbed ground can attract migratory birds seeking foraging and nesting habitat. If non-avoidable ensure increased active management and monitoring to reduce possible increase bird attractive and bird strike risk. Sow Avanex® endophytic grass (hydroseeded) across open areas to deter avifauna feeding Monitor open substrates and stockpiles daily, and use stockpile covers or temporary deterrents (e.g. windrows on pigtails) to discourage bird use on open substrates Care should be taken to ensure efficient and effect grass coverage on site to minimise the duration that substrates are exposed Note: grass watering may be required if sown in dry conditions **Post-development** Maintain grass at a height between 200 and 250 mm Grass should be fertilised and maintained to ensure full (100%) coverage as well as endophyte quality and resilience.

Table 6: Passive Management Pre- and Post-Development	
Type of Habitat	**Pre-development, during and post-development habitat management**
Buildings	**Pre-development** Maintain communication between design, construction, and management teams to ensure roof pitch, fixtures, and other design features incorporate bird-deterrent considerations. Incorporate bird-deterrent design features, limit flatness of roof tops, increase pitch if possible, avoiding ledges, rafters, or other roosting opportunities. Where unavoidable, install bird spikes or bird-slope sections. Paint colours and types that do not conduct heat should be used to limit the attraction of bathing birds. Industrial building doors should remain closed when not in active use to eliminate birds nesting on internal structures. Lighting design has been developed in consultation with a lighting specialist and is detailed in the PDP Lighting Management for Aerial Fauna Memorandum (PDP, 2025b). Blue-hued lights, which attract insects and consequently insectivorous birds, will not be used on site. **Post-development** Roof tops and other building structures should be monitored regularly to ensure mitigation measures are effective in managing roosting birds. If they are not sufficient an assessment should be conducted by an avian ecologist.
Vegetation	**Pre-development** Conduct bird counts and monitoring of large or problematic trees. Landscape planting should prioritise species with open crowns to reduce roosting and nesting opportunities. Select plant species with low attractancy (minimal flowers, fruit, or seeds) and prefer low-stature species, particularly to the west of the site near the approach fan/Obstacle Limitation Surface (OLS). DCM Urban proposed landscape plans for the development have been reviewed, with input provided by PDP. Therefore, the plans are supported from a bird strike management perspective (DCM, 2025).

Table 6: Passive Management Pre- and Post-Development	
Type of Habitat	**Pre-development, during and post-development habitat management**
	Proposed street plantings (approx. 50 m spacing) include upright red maple (*Acer 'Bowhall'*), frontier elm (*Almus parvifolia)* and scarlet oak (*Quercus coccinea*), which are suitable due to their upright form, maturity height, and deciduous habit. The 3 m boundary planting buffer east and south of the site include low-attractance species; planting along Ryans Road and Grays Road will provide visual screening. Lemonwood (*Pittosporum eugenioides*), ribbonwood (*Plagianthus regius*) and green layand cypress (*Cupressus x leylandii 'Ferndown'*), koromiko (*Veronica salicifolia*) and kāpuka/broadleaf (*Griselinia littoralis)* will be planted due to species lower seed production and limited food value for birds. Vegetation within the stormwater management areas are all species that comprise of low bird attractance. They differ from the CCDP 2024, *Appendix 6.11.9* list due to the function requirements of the Stormwater 360 Filterra bioscape manual. **Post development** Undertake thinning and crown-lifting of existing trees to reduce roosting sites and food sources. Control weeds, algae, and moss regularly. Review future planting plans to avoid establishment of large canopy species that could become bird attractants. Restrict landscaping on the individual lots to species in Appendix 6.11.9 Plant Species for Water Bodies and Stormwater Basins in the Bird strike Management Area in Appendix 6.11.7.5
Waterbodies / drainage	**Post-development** Improve drainage wherever practicable and fill low-lying areas where water accumulates. Ensure correct drainage reinstatement following works. Site stormwater facilities will consist of a Filterra Bioscape approach. This will create zero standing water except in rare extreme high intensity rainfall. The site should be monitored and managed accordingly, during rare and extreme rainfall events as it may increase bird activity and bird strike risk. Monitor bird numbers and undertake pest control as required.

Table 6: Passive Management Pre- and Post-Development	
Type of Habitat	**Pre-development, during and post-development habitat management**
Perching features	**Post development** Monitor for common perching areas and remove/ manipulate these features where possible. Use bird gel deterrent/ grease on fences or other rest areas where possible.
Waste storage	**Pre and post development** There should be no open rubbish areas on site and or allotments to eliminate pest bird and pest mammal scavenging. Install bar locks and covered lids on all bins; food waste must be contained in sealable bags. Ensure a Waste Management Plan is in place to regularly remove rubbish/waste before it attracts avifauna.
Individual lot pest management and hygiene	**Post development** Ensure all lots/ activities effectively manage / control pest mammal species such as rodents that can attract prey bird species.

6.2 Active Management

Active management measures are implemented when avifauna activity at the site changes from that typical of baseline conditions (i.e., either during or after construction). For example, when there is a sudden increase in bird abundance, or when extreme to high risk species are observed in significant numbers, additional management interventions are required to reduce risk.

For this WHMP, a significant number is defined as any occurrence where bird activity poses an elevated strike risk or exceeds normal site averages observed during routine monitoring. When such thresholds are reached, immediate dispersal or control methods must be implemented to reduce the risk of bird strike.

Strategies for reducing avifauna attractancy at the site focus on managing extreme to medium risk wildlife populations as determined in the Ryans Road Risk Matrix in Table 4.

6.3 Management of Extreme to Medium Risk Species

Risk management strategies should focus on managing extreme to medium risk wildlife populations occurring on and around the site as determined in the CIAL Bird Risk Matrix (Table 4) and in accordance with the CIAL WHMP.

This section outlines active methods to manage extreme to medium risk species, details of their key-behaviours and preferred habitats, alongside corresponding risk management actions are outlined in in Appendix 1. Active management can be undertaken by contractors assigned by the Site Developer/Site Manager or in consultation with CIAL Wildlife Hazard Management Team.

Table 7: Active Management Techniques for High to Medium Risk Species

Techniques	Primary Target	Effectiveness
Non-lethal Dispersal		
Vehicle patrols/horn	Southern black backed gull Rock pigeon Spur-wing plover	High
Reflective tape on standards/pigs' tails	Southern black backed gull Rock pigeon Spur-wing plover	High
Pyrotechnics if feasible	Swamp harrier Southern black backed gull Rock pigeon Spur-wing plover	Moderate
Bird distress calls/sirens	Southern black backed gull Rock pigeon Spur-wing plover	Moderate
Laser (in consultation with CIAL ONLY)	Southern black backed gull Rock pigeon Spur-wing plover	Moderate to high
Lethal Dispersal		
Alphachloralose baiting	Rock pigeon Southern black backed gull (with permission from ECAN)	High
Firearms (in consultation with CIAL only)	Southern black backed gull Rock pigeon Spur-wing plover	High

7.0 Wildlife Procedures

The following procedures outline the required mitigation actions during each project phase to minimise wildlife attractants and ensure compliance with CIAL's off-airport wildlife risk management framework.

Passive and active management mitigations should be carried out in accordance with Tables 6 & 7 above.

7.1 Pre-construction

- Pre-development passive and active management mitigations should be carried out prior to construction commencing:
  - Mowing site grass to disperse birds in a southward direction away from the CIAL flight path.
  - Implement communication plan of development timelines with CIAL before development works take place to mitigate potential avifauna issues and offer support if any issues arise.
  - Enact roles and responsibilities - includes liaising with external stakeholders (e.g., CIAL) to determine the obligations of respective organisations and their personnel.
  - Undertake passive and active management methods – surveillance and monitoring, grounds management specifications (i.e., recommended grass heights to deter extreme to high risk species), and seasonal bird counts (this could be completed by CIAL and/or site surveillance personnel).
  - Implement landscape and waterbody design standards and mitigations.
  - Monitor and review procedures of WHMP – this should include liaison with CIAL with increases in bird numbers onsite being communicated so appropriate countermeasures can be implemented.

7.2 During Construction

Construction activities (trenching, excavation and stockpiling) have the potential to attract birdlife. Passive and active management mitigations should be carried out in accordange with Tables 6 & 7 above.

Potential bird attractant risks at the construction site are expected as follows:

- Waterfowl may be attracted by trenching and excavation works that create stockpiles (high roosting sites) or depressions that fill with water;

- The Filterra Bioscape stormwater facilities will create zero standing water. However, in rare and extreme weather events they may create minimal standing water that may be attractive to wading birds if standing water is present for too long[1]; and,
- Grassing/seeding can be a highly attractive food source to a range of bird species depending on the species of seed we recommend hydroseeding of Avanex grass seed, which eliminates open substrate and bird feeding opportunity (Table 6).

Measures to mitigate these risks identified in Table 6 & 7 and will include daily site inspections during construction for water ponding and bird activity, promptly draining stormwater, covering materials i.e. stockpiles when not in use or using pigs tales with windrows and avoiding the creation of standing water.

Construction staff will be briefed on wildlife risk mitigation, and any sightings, bird strike or near-misses with extreme to high risk species will be reported immediately to the WHMP coordinator who will report to CIAL and CAA. These steps aim to reduce potential wildlife attractants and maintain aviation safety during the construction period. In the BSA, 14 species were recorded, and no threatened native species were identified, risk to native birds during construction/earthworks is therefore unlikely. However if pre-construction site inspections indicate breeding activity of native species protected under the Wildlife Act (not observed on eBird or in the BSA) postponing works following breeding season is recommended to protect bird values and reduce bird strike risk.

7.3 Post Construction

Wildlife management measures (see section 6) as well as the following wildlife management procedures will continue to be important aspects of informing and managing bird strike risk at the site:

- Regular inspection of rooftops for nesting gulls/pigeons is recommended.
- Grass should be kept short between a height of 200 and 250 mm to discourage bird nesting and feeding.

[1] Literature does not offer a definitive timeframe for ducks or gulls to colonise newly formed standing water, however bird movement studies show strong daily commuting behaviour for ducks tied to water availability (e.g., mallards adjusting routes based on freshwater presence (Kleyheeg et al., 2017)). Given the high risk and consequences of bird strikes, a 24-hour threshold is a conservative operational assumption. If water remains present after 24 h, one must assume it has become, or will become, attractive to hazardous species (especially gull and duck spp.) and site managers will need to act accordingly. This aligns with best practice in wildlife hazard management to err on the side of safety.

- Restrict new individual lots landscaping to species in Appendix 6.11.9 Plant Species for Water Bodies and Stormwater Basins in the Birdstrike Management Area in Appendix 6.11.7.5.
- Waste management, particularly of food waste (as per Table 6) will prevent gull attraction.
- Interior lot pest management and hygiene methods to ensure mammalian pest control (as per table 6).
- Annual bird counts conducted by an avian ecologist for 5 years following development is necessary to monitor the impacts of management measures in place.
- Monitoring results are to be reviewed annually and the WHMP updated accordingly.

We recommend that continued use of this WHMP is utilised and the Site Manager/CIAL is assigned to conduct monitoring of the site, noting bird numbers, changes in abundance and the presence of extreme to high risk species. This person should also be responsible for communicating relevant information with CIAL, especially if there is an increase in high risk bird species activity.

7.4 Escalation Procedures

If active management measures do not achieve an immediate and sustained reduction in wildlife presence, the incident must be escalated to CIAL's Wildlife Management Team for further assessment and coordinated response.

Escalation should occur when:

- Bird numbers or activity remain elevated after two consecutive dispersal attempts;
- Extreme to high risk species identified in the Bird Strike Risk Matrix (Table 4) are observed roosting, nesting, foraging on site;
- Evidence of nesting or roosting occurs on key site structures; and/or,
- Wildlife behaviour indicates habituation to standard deterrent methods.

Following escalation:

- the Site Manager will document the incident, including species observed, numbers, behaviour, control techniques applied, and outcomes; and,
- this information will be included in the monitoring summary submitted to CIAL.

Where ongoing risk persists, the Site Manager, in consultation with CIAL, may engage a qualified wildlife consultant to recommend further actions, including consideration of lethal control measures (subject to relevant legislation and permits).

All wildlife management incidents and responses must be recorded in a Wildlife Hazard Log and maintained as part of the site's WHMP documentation. This ensures traceability, supports adaptive management, and contributes to the continuous improvement of the WHMP.

7.5 Monitoring Risk to Inform Management Procedures

Bird counts are to be performed by a suitably qualified bird expert delegated by the site manager. Bird counts are important to ensure early detection of wildlife hazards to reduce risk to CIAL. They also assist with locating eggs and nests. Timings of bird counts may be incidental and subject to agreement between the Site Manager and CIAL.

Where medium to extreme to high risk birds are non-responsive, increase in abundance, cross from/ to the site through the flight path, CIAL should be contacted immediately. The Wildlife Officer will then employ wildlife hazard procedures, which could include more frequent bird counts. If risks are severe, CIAL may wish to contact their Airport Control Tower (ATC) to notify pilots of the hazard.

Where there is a significant increase in risk, the CIAL Head of Operations can arrange for a Notice to Airman (NOTAM) to be issued and/or an Automatic Terminal Information Service (ATIS) recording to be made. The NOTAM will provide specific information on species, period of risk, likely location, and flight path.

Bird activity inspections should be carried out regularly and informally when activity arises. CIAL may conduct wildlife counts during their off-airport wildlife risk monitoring programme. Data should be recorded using an excel spreadsheet or another preferred data management system.

7.5.1 Wildlife Count Procedure

Methods for Monitoring

The following data should be recorded during each count:

a) Name of observer;

b) Date;

c) Time of commencement and completion of the count;

d) Weather conditions (the use of the ATIS Meteorological broadcast is suggested;

e) Bird species, number and location; and,

f) Species behaviour – Roosting, foraging, flying, nesting.

Procedure:

1. Ensure birds are counted in all habitats - check pavements, grass areas and trees for nesting birds;
2. Count birds in each location within a 100 m radius of the observer and record the following:
    a) Species and number observed;
    b) Species behaviour – Resting, feeding/foraging, flying, loafing;
    c) Area recorded (e.g., including birds transiting one area to another); and,
    d) Special notes such as mowing or ponded water that may cause additional attractions. The form includes frequently observed bird species and allows room for additional species as well as unidentifiable bird types.
2. Following each count, the average observation rate of each bird species should be calculated at each location. Round numbers up or down to the nearest whole number and capture on the bird counting system.

8.0 Wildlife Hazard Management Plan Monitoring & Review

8.1 Overview

This WHMP should be reviewed annually in conjunction with CIAL WHMPs to ensure alignment with current airport-wide risk management objectives. CIAL currently undertakes offsite bird counts in the surrounding area and may be able to assist with site-level bird strike monitoring and data sharing.

This WHMP will be reviewed annually or following any significant site or operational changes, especially to be triggered by any of the following:

- A strike occurs involving a species linked to the site;
- Presence of extreme to high risk bird species near aviation pathways;
- Evidence of nesting on site structures;
- Unusual congregation or flocking activity; or
- Monitoring shows increased presence of extreme to high risk species.

A review of the outcomes will be communicated to CIAL's Wildlife Management Team and integrated into CIAL's off-airport WHMP database.

A major review of the CIAL WHMP will be undertaken in the event of significant changes on the airfield. This is the responsibility of the CIAL Head of Operations Manager and will result in a full revision and re-issue of the document. The review will be supported, where required, by a qualified avian specialist. Major reviews may replace standard annual reviews in the years they occur.

CCC will **certify** the WHMP with **CIAL consultation prior to implementation**.

8.2 Reporting and On-going Site Management

Routine reporting ensures that all staff and managers are equipped with the information needed to adapt WHM activities when required. The following reports will be generated:

Frequent Wildlife Counts

The developer will undertake frequent wildlife counts as detailed in Section 7.5. Wildlife data will be submitted to CIAL and stored in the Airport Wildlife Database.

CIAL Monthly Summary

At the end of each calendar month, CIAL analyses on and off airport wildlife count data as part of a monthly report. The monthly report summarises any environmental changes or unusual conditions that may have led to changes in risk level. CIAL may request site count data to inform their monthly report.

The monthly summary will provide an opportunity for any new information on policy and procedure effectiveness, training requirements and other improvements.

References

Civil Aviation Authority of New Zealand. (2024) *Civil Aviation Authority Part 139 - Aerodromes, Certification, Operations and Use.* Civil Aviation Authority of New Zealand. Retrieved from https://www.aviation.govt.nz/rules/rule-part/show/139

Civil Aviation Authority Of New Zealand. (2024) *Bird Incident Rate Report*. Civil Aviation Authority of New Zealand. Retrieved from https://www.aviation.govt.nz/assets/publications/bird-hazard-reports/Bird-incident-rate-report-2024-Q3.pdf

Civil Aviation Authority Of New Zealand. (n.d.). *Bird strike risk.* Civil Aviation Authority of New Zealand. Retrieved from https://www.aviation.govt.nz/assets/publications/gaps/Bird_Hazards.pdf

Christchurch City Council (2024). *Chapter 6 – General Rules and Procedures*. Christchurch City Council District Plan. Retrieved from https://districtplan.ccc.govt.nz/

Christchurch International Airport Limited (2020). *Christchurch International Airport Wildlife Hazard Management Plan.* Christchurch International Airport

DCM Urban (2025). *Landscape and Visual Impact Assessment Graphic Statement*. 104 Ryan Road Industrial Subdivision. Prepared by DCM Urban.

International Civil Aviation Organisation. (2022) Annex 14 to the Convention on International Civil Aviation. Volume 1: Aerodrome Design and Operations. Ninth Edition. Retrieved from https://elibrary.icao.int/reader/274803/&returnUrl%3DaHR0cHM6Ly9lbGlicmFyeS5pY2FvLmludC9wcm9kdWN0LzI3NDgwMw%3D%3D?productType=ebook

International Civil Aviation Organisation (2012). Airport Services Manual, Part 3: Wildlife Control and Reduction. Retrieved from Microsoft Word - Doc.9137.Part.03.4th.Edition.alltext.en.docx

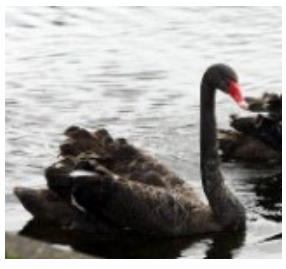
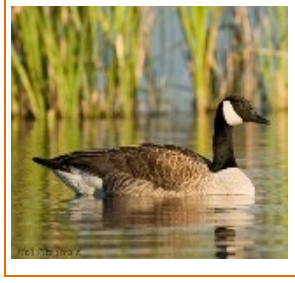
New Zealand Aviation Wildlife Hazard Group (NZAWHG). (2022). New Zealand Aviation Wildlife Hazard Group. Retrieved from https://nzawhg.nz/#home

NZ Birds online. (2024). NZ Birds Online. Retrieved from https://www.nzbirdsonline.org.nz/

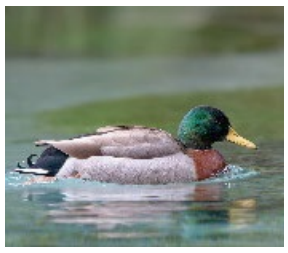
PDP (2025a). Three Waters Servicing Report for Ryans Road Development. PDP technical report prepared for Carter Group Limited.

PDP. (2025b). Memorandum – Lighting Management for Aerial Fauna – 104 Ryans Road. PDP technical report prepared for Carter Group

Appendix A: Prioritised Species Management Table

Appendix A: Prioritised Bird Species for Strike Management			
Species	**Risk Rating**	**Description**	**Risk Management Methods**
Australian magpie 	Medium	Black/white, aggressive, territorial; breeds Jul–Jan; found in grassland, foraging in loose groups or pairs. Introduced and naturalised.	Pyrotechnics, gas guns, reactive patrols. Prevent settlement. Consider culling if unresponsive. Remove food
Australian/swamp harrier 	Extreme	Tawny-brown; glides over open areas; breeds Sep–Apr on ground/low vegetation; feeds on small animals/carrion. Territorial and smart, often get out of the way of incoming planes. Native, not threatened.	Pyrotechnics, gas guns, reactive patrols. Leave resident harriers; do not cull. It is recommended to leave the resident harrier to occupy the territory or another less "airport-educated" harrier will move in to replace it.
Banded dotterel 	Low	Small plover, often in pairs or small flocks; nests Jul–Jan in shallow scrapes on sand/gravel; found in harbours, rivers, farmland. Native, declining.	Pyrotechnics, gas guns, reactive patrols. Remove food sources; prevent settlement
Southern black backed gull 	Extreme	White underparts, black back; yellow bill; nests Sep–Mar in bulky vegetation; common in estuaries/farmland. Native, not threatened.	Pyrotechnics, reactive patrols; maintain short grass; remove food sources. Culling if unresponsive, often targetable when they congregate on airfields following rain to feed on insects.
Black-fronted tern 	Low	Small grey tern; nests Oct–Jan in sand/riverbed stones; coastal braided rivers, farmland. Native, nationally endangered.	Use of pyrotechnics, gas guns and reactive patrols. Do not allow birds to settle.
Black swan 	High (generally)	Large ~5 kg black bird; red beak; feeds on aquatic vegetation; often near farmland. Repopulates quickly, if numbers are high they present significant risk Not threatened.	Reactive patrols, egg oiling, prevent settlement, culling
Canadian goose 	High (generally)	Large ~5 kg goose; black neck, white chinstrap; breeds Sep-Jan near lakes/wetlands Create a significant risk in high numbers Introduced and naturalised.	Reactive patrols, prevent settlement, monitor numbers, culling

Appendix A: Prioritised Bird Species for Strike Management			
Species	**Risk Rating**	**Description**	**Risk Management Methods**
Common pheasant 	Low	Large ground bird; males brightly coloured with a white collar, females brown and mottled; breeds Sep-Dec in farmland. Higher risk when foraging in open areas near aircraft paths. Introduced and naturalised.	Pyrotechnics, reactive patrols, remove food sources, prevent settlement, culling
Eurasian skylark 	Medium	Small, brown-streaked bird with a short tail; Prefers open farmland and grassland, risk higher in long grass or near abundant food, nests Aug Introduced and naturalised.	Pyrotechnics, reactive patrols; maintain short grass; prevent settlement. Culling
Eurasian blackbird 	Medium	Small bird; often alone or in pairs. Higher abundance in long grasses where food is available; nests Aug-Feb Introduced and naturalised	Pyrotechnics, reactive patrols; maintain cut height; remove food sources. Culling if unresponsive
European Starling 	Medium	Iridescent black flocking bird; nests Sep-Dec in cavities; risk higher in long grass or at dusk Introduced and naturalised	Pyrotechnics, daily patrols; maintain grass, spray weeds, prevent settlement
European Goldfinch 	Low	Small yellow-winged bird; abundant in long seeding grasses, nests Oct-Mar Introduced and naturalised.	Pyrotechnics, reactive patrols, maintain cut height, culling
European greenfinch 	Low	Green males with yellow bars, high abundance with high seed abundance Introduced and naturalised	Pyro, reactive patrols, maintain grass height low, culling
House sparrow 	Medium	Congregate around buildings and people Introduced and naturalised	Pyro, air guns, reactive patrols. Maintain cut grass height, do not allow to settle, culling.

Appendix A: Prioritised Bird Species for Strike Management			
Species	**Risk Rating**	**Description**	**Risk Management Methods**
Mallard duck 	High	Males green headed, females brown; habitat near waterways and wetlands; creates small flocks; breed Jul-Dec Introduced and naturalised	Pyrotechnics, lasers, gas guns, reactive patrols; culling if unresponsive
Pukeko 	Low	Medium sized blue black wetland bird; nests in grasses and reeds near water in pairs or small groups Native, not threatened.	Pyrotechnics, reactive patrols, prevent settlement, manage vegetation; culling if unresponsive
Red-billed gull 	Medium	White gull with red bill; nests Sep-Jan in colonies near water bodies, congregate on airfield after rain to feed Native, at risk - declining.	Pyrotechnics, reactive patrols, prevent settlement
Rock pigeon 	Extreme	Plumage variable; nests on buildings, bridges, cliffs. Reproduce rapidly and are in high abundance where food waste is available. Introduced and naturalised.	Pyrotechnics, gas cannons, reactive patrols, perching spikes, maintain cleanliness and food opportunity. Culling
Shining Long-tailed Cuckoo 	Low	Small iridescent dark green that prefers densely vegetated areas Native, not threatened. Seen on PDP bird count.	Pyrotechnics, gas guns, reactive patrols. Remove large trees where possible.
Silvereye 	Low	Small; white eye-ring; nests Aug-Feb, habitat generalist but prefers thick vegetation. Self-introduced and naturalised, not threatened.	Pyrotechnics, gas guns, reactive patrols. Remove large stands of trees
Song Thrush 	Medium	Small brown bird; risk higher in long grass, nests Aug-Feb Introduced and naturalised.	Pyrotechnics, reactive patrols; maintain cut height; remove food sources. Culling if unresponsive.

Appendix A: Prioritised Bird Species for Strike Management			
Species	**Risk Rating**	**Description**	**Risk Management Methods**
Oystercatcher, South Island Pied and Variable 	Medium	Black and white shorebird; nests Aug-Jan and flocks near water/farmland Native, at risk - declining	Pyrotechnics, reactive patrols. Prevent settlement.
Spur winged plover 	High	Grey back/white breast; aggressive, territorial; nests Jun-Nov; prefers open land, breeds twice per year. High body density and cause damage to aircraft. Self-introduced and naturalised, not threatened	Daily patrols; monitor insects/weeds; nest ID; egg oiling; prevent settlement.
Yellowhammer 	Medium	Bright yellow male; nests close to ground in grasses; increased presence from seed abundance Introduced and naturalised.	Pyrotechnics, reactive patrols. Prevent settlement.

Notes:

1. *Species listed in this table are 1. Evident at PDP site visits, 2. Known to be present at CIAL and contained in Appendix D of the CIAL WHMP..*
2. *All photos and bird descriptions are credited to the respectively pages for each species on NZ Birds Online'*

Appendix B: Figure

C052850002.aprx - C052850002GIS001

0 500 1000
METRES
SCALE : 1:50,000 (A3)

NO.	REVISION	DATE	BY
A	FINAL	DEC 24	KB

SOURCE:
1. AERIAL IMAGERY (FLOWN 2022) SOURCED FROM THE LINZ DATA SERVICE www.linz.govt.nz/ AND LICENCED FOR RE-USE UNDER THE CREATIVE COMMONS ATTRIBUTION 4.0 INTERNATIONAL LICENCE.
2. CADASTRAL/TOPOGRAPHICAL INFORMATION AND INSET DERIVED FROM LINZ DATA.

CLIENT
CARTER GROUP

FIGURE
FIGURE 1: SIGNIFICANT WILDLIFE HABITATS SURROUNDING CHRISTCHURCH INTERNATIONAL AIRPORT

PROJECT
RYAN ROAD FAST TRACK PROJECT