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memorandum

TO	Tim Carter	FROM	Lizzie Civil
	Carter Group Limited	DATE	7 March 2025
RE	Avifauna Hazard Management – 104 Ryans Road		

1.0 Introduction

Carter Group Limited (CGL) requested Pattle Delamore Partners (PDP)[1] to undertake an avifauna assessment at 104 Ryans Road, Yaldhurst, to outline potential avian strike hazards and recommend design and management mitigations for a proposed industrial development at the site. This technical memorandum outlines these assessments and has been prepared to support their Fast-track application.

The 55.5 ha site is located northwest of Christchurch City, approximately 9 km from the city centre. It is directly south of Christchurch International Airport Limited (CIAL), with the northwestern corner approximately 170.5 metres from the threshold of runway 02/20.

The 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 Christchurch City District Plan (CCDP). It is located approximately 6 km south of the Waimakariri River. The site contains abundant vegetation including rank grass, shrubs and larger trees, with multiple old, abandoned buildings.

The property at 104 Ryans Road is being developed into an industrial site with the establishment of logistics, warehousing, light manufacturing, and other airport-related businesses. Site plans have been produced by Capture Land Development Consultants, and the development is generally envisaged to follow the parameters of the Industrial General Zone in the CCDP in respect of activity types, built form, and relevant standards.

Site development will include habitat changes (i.e., the development of buildings and infrastructure) that will influence wildlife behaviour and require 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 working in consultation with CIAL to control and manage the threat of bird strikes.

PDP ecologists[1] conducted an onsite assessment of avifauna habitat on 27 November 2024 to determine whether suitable habitats are present or may support native and endemic breeding birds. We conducted five-minute bird counts in 15 locations to assess species numbers, behaviour and flight path patterns (see Sections 7.0 and 8.0).

[1] Appendix A contains information on the experience of PDP staff involved in providing avifauna advice for the 104 Ryans Road Fast-track application.

2.0 New Zealand Aviation Legislation and Best Practice

In 1993, the Civil Aviation Authority (CAA) New Zealand (NZ) introduced the operating rules for certified airports under the Civil Aviation Rules (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 Wildlife Hazard Management Plan (WHMP) to minimise or eliminate 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 New Zealand Aviation Wildlife Hazard Group (NZAWHG) and Australasian Aviation Wildlife Hazard Group (AAWHG) are nationally formed bodies that are recognised by the CAA and International Civil Aviation Organisation (ICAO). Collectively, they promote and enhance aviation safety and best practice. Each group has adopted ICAO's best practice standard to establish 3, 8 and 13 km WHM Zones around aerodromes (NZAWHG, 2022).

3.0 The International Civil Aviation Organisation

In 1944 a treaty for the Convention on International Civil Aviation was established by ICAO becoming effective in 1947. The treaty was established to promote cooperation and understanding between national aviation services. The CAA of NZ is a signatory to the Convention and are therefore legally obligated to take heed of the standard. In its strictest interpretation, for a development to proceed on or near an aerodrome, it must be shown that the development will not in itself increase bird presence leading to bird strike risk. Annex 14 to the Convention states (ICAO, 2022):

- *Action shall be taken to decrease the risk to aircraft operations by adopting measures to minimize the likelihood of collision between wildlife and aircraft.*
- *Note: Procedures on the management of wildlife hazards on and in the vicinity of an aerodrome, including the establishment of a wildlife hazard management programme (WHMP), wildlife risk assessment, land-use management and personal training are specified in the PANS, Aerodrome (Doc 9981) Part 11, Chapter 1 and 6. Further guidance is given in the Airport Services Manual (Doc 9137 (Part 3/ (ICAO, 2022, Chapter 9, Section 9.4.3). The appropriate authority shall take action to eliminate or prevent the establishment of garbage disposal dumps or any such other source attracting bird activity on, or in the vicinity of, an aerodrome, unless an appropriate aeronautical study indicates that they are unlikely to create conditions conducive to a bird hazard problem (ICAO, 2022, Chapter 9, Section 9.4.4).*

4.0 Christchurch City District Plan

4.1 Overview

There are bird strike management provisions in the CCDP for areas within 3 km of the thresholds of CIAL runways. Within the bird strike management areas, certain land use activities that may attract birds are restricted and/or specific bird strike risk management techniques are required (CIAL WHMP, 2020; CCDP, 2024).

4.2 The Site in context of the Christchurch City District Plan

The development site at 104 Ryans Road is approximately 170 m from the threshold of runway 20, with its western edge within the approach/take off fan/Obstacle Limitation Surface (OLS). This makes the location of the site one which requires bird strike risk to be assessed and managed. The management of birds in the vicinity of 104 Ryans Road will be required, with site management works likely needing to be undertaken in consultation with CIAL to control and manage the threat of bird strikes.

CCDP Activity rules within a 3 km radius from the CIAL runway threshold that apply to the development of the site include:

Bird Strike Management Areas: Rule 6.7.4.3.1 P3 provides that the creation of a stormwater basin, or a waterbody less than 500 m^2 in area or with a combined area of less than 1000 m^2 if more than one stormwater basin and/or waterbody is present within 0.5 km, is permitted if the stormwater basin and/or waterbody is designed by a suitably qualified person, with experience in stormwater management systems, to the following standards (CCDP, 2024):

- *Stormwater infiltration basins shall be designed to fully drain within 48 hours of the cessation of a 2% AEP storm event*
- *Sufficient rapid soakage overflow capacity shall be provided to minimise any ponding of stormwater outside the infiltration area(s)*
- *Plant species used shall be limited to those listed in Appendix 6.11.9*
- *Side slopes shall be at least as steep as 1H:4V except for, any side slope treated with rock armouring, or any area required for vehicle access, provided that such access has a gradient of at least 8H:1V*
- *No permanent island features shall be included, that could provide perching sites for birds*

Restricted Discretionary Activities: Rule 6.7.4.3.3 RD2 provides that any activity listed in rule 6.7.4.3.1 P3 above that does not meet one or more of the activity specific standards is a restricted discretionary activity, with the Council's discretion related to the scale and significance of birdstrike risk likely to be created at the location proposed, and mitigation of birdstrike risk including by design measures, operation or management procedures, direct intervention practices and monitoring (CCDP, 2024). The application does not meet P3 as two stormwater basins are proposed of approximately 1,690 m2 and 1,200 m^2 in size and within 500m of each other. They will therefore require resource consent under this rule. See further details on the site's stormwater basin design in Section 10.1.1.

Runway End Protection Areas and Protection Surfaces: Rule 6.7.4.2.6 PR1 provides that any building or utility within the Runway End Protection Area (REPA) is a prohibited activity. Rule 6.7.4.1.6 PR1 provides that any part of a building, structure, tree or utility that penetrates the Christchurch International Airport's Protection Surfaces is a prohibited activity.

The western edge of the site (as identified in Appendix B) is within the REPA and Protection Surfaces. Proposed building and utility design as well as tree heights and structures within this area will comply with these rules and will be designed in a manner that they do not increase bird strike risk.

The REPA and Protection Surfaces have been mapped by Capture Land Development Consultants Limited and are attached to the Fast-track application. The application does not seek consent to establish any buildings or utilities in the REPA, nor penetrate any of the Protection Surfaces.

5.0 Christchurch International Airport

5.1 Background

The CIAL precinct consists of 860 ha of land (approximately 240 ha grassland) bound by a perimeter security fence. The majority of airfield vegetation has been developed with a generic grass species (endophytic tall fescue species) suited to the environmental conditions.

CIAL is operated by the Air Traffic Control Tower (ATC) 24 hours 7 days a week. The traffic profile is mixed between general aviation (international wide body and domestic), private, medical rescue, military and charter. CIAL has approximately 43,000 aircraft movements per annum making it the second busiest airport in New Zealand.

CIAL has two sealed runways forming a cross. The main runway 02/20 is 3288 m long by 45 m wide. The secondary and intersecting runway 11/29 is 1741 m long by 45 m wide. A grass runway (Grass 02/20) is used for flight training operations and is 515 m long, running parallel with the main 02/20 runway (see Appendix B).

5.2 Wildlife Hazard Management Plan

The goal of the CIAL WHMP is to enhance safe aircraft operation and to protect passengers, flight crews, aircraft and operational capability by minimising the risk of collisions between aircraft and wildlife on and near the aerodrome.

The CIAL WHMP objectives are (CIAL WHMP, 2024):

- *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; and*
- *Ensure CIAL personnel are trained to a high standard so to preform wildlife management safely and effectively.*

5.3 CIAL Annual Wildlife Strike Statistics and Wildlife Hazard Management Efforts

Bird strike at CIAL has generally increased since 2019, rising from 34 strikes to 50 strikes per annum in 2024. This is an average of five strikes per 10,000 aircraft movements (upkeeping under five strikes per 10,000 movements is a CAA Bird Incident Rate Reporting standard (CAA, 2024). From 2019-2024, CIAL strikes consisted of 50-70%, small avian species, 5-30% medium species and 2-9% large species. In 2024, strikes consisted of 60% small species, 20% medium species and 9% large species (see table in Appendix C).

CIAL conduct annual Southern black backed gull management, which consists of breeding control and active culling within a 13 km radius of CIAL extending to Waimakariri River.

5.4 CIAL Wildlife Risk Assessment

The NZAWHG has 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, each of which is scored. Likelihood scores are calculated based on the likelihood of each species being present at an aerodrome, alongside bird strike statistics over a 5-year period. Consequence scores are based on bird weight, flocking size and general behaviour. Below is the most recent CIAL 2022 Bird Risk Matrix. Highlighted in bold are species seen on site during PDP avian counts (see results in Section 8.1). The CIAL 2022 Bird Risk Matrix layout differs from the NZAWHG Bird Risk Matrix, for the purpose of the below table the layout has been rearranged, this does not affect the general risk categorisations between the two matrix tables.

Table 1: CIAL Bird Risk Matrix 2022

		Consequence				
Likelihood		Negligible (0-4)	Minor (8-20)	Moderate (21-33)	Significant (34-46)	Severe (47+)
	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			

Note: CIAL use majority strike data to inform their Risk Matrix. Bird species such as Canada geese can potentially present a significant 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.

6.0 Desktop Survey - Extended Site Habitat

A desktop exercise was conducted reviewing information within a 3 km radius (and on the borders) of the airport and the site. Appendix B maps where substantial habitat with moderate to high bird attractance was identified.

North of the site and airport, there is condensed agriculture/farmland, a quarry, a golf course and a large reserve (to the northeast) containing pine shelter belts with small stands of native trees.

East of the site, there are smaller agricultural/farmland blocks with a medium sized nature reserve and golf course.

South of the site is mixture of farmland pasture with pine shelter belts with small stands of native trees, a quarry, Riccarton Racecourse, a golf course and Ruapuna Raceway.

Waimakariri River is approximately 6 km to the north of the site and the sea on the east coast is approximately 17 km away. Significant terrain features include the Southern Alps to the west and the Port Hills to the southeast.

7.0 Field Surveys - Site Habitat

Field surveys were carried out by two PDP ecologists on the 27th of November 2024 under adequate weather conditions (dry, warm and low wind). Visual and auditory avian counts were conducted at 15 pre-determined locations within the site grounds. Site habitats and vegetation were surveyed (see site photographs in Appendix D).

7.1 Old Abandoned Buildings

The area surrounding the old, abandoned buildings provides extensive habitat for avifauna, such as roosting, nesting, breeding, and foraging. Active common starling nests were found in the walls of several buildings. A large number of 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.

7.2 Site Flora

The site consists of mostly open rank pasture grasses common 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.),* hydranger (*Hydrangea* spp.), wild ginger, 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.

7.3 Open Pasture

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.

8.0 Results

8.1 PDP Avian Counts

Overall, 14 avian species were recorded and a total of 284 individual birds were counted. Four of the 14 species are classified as New Zealand endemics. A summary of the data is provided in Table 2 below. Note that 20 finch species were seen and heard from a distance, but the sub-species could not be determined.

Table 2: Bird Count Data (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**

8.2 Endemic Avifauna Impact

The four endemic species counted during avifauna counts were two swamp harriers (not threatened), a single pūkeko (not threatened), long-tailed cuckoo (nationally vulnerable) and a South Island pied oystercatcher (declining). There were no signs of these species breeding onsite.

- Swamp harriers create a raised bed nest of sticks, grasses and assorted vegetation on the ground or situated within crops, shrubs and tall grass between October to December (NZ Birds Online, 2024). Given the site is large and currently abundant with favourable nesting vegetation it is possible that they may breed on site, but no signs were seen during the site visit.
- Pūkeko commonly create nest hollows near waterways or on floating platforms. There is an irrigation race along the frontage of Ryan Road however it is poor quality and unlikely to be used as Pūkeko habitat.
- Long-tailed cuckoo lay their eggs in yellowhead, whitehead and brown creeper nests. None of these species were seen on site during our site visits.
- South Island pied oystercatcher commonly breed near the sea on shell banks or rock substrate. It is highly unlikely they would choose the site as a breeding location.

8.3 High-Risk Habitats

PDP assessed the current and future risks following the sites development. The habitats identified in Table 3 below have the potential to attract high-risk species to the site thus causing avifauna movements to and from the site to other areas in the vicinity of CIAL.

Table 3: High-risk habitats, Land Activities and their Attractance

Area	Habitat Type	Attractance	Developed site's potential impact
Grassed areas	Open grassland and rank grass	Seeded grass attracts foraging seed-eating birds such as finch, skylark, starling, common pheasant and yellow hammer. It also attracts scavenging birds like the swamp harrier.	The development of the site reducing the overall grass area, may reduce seed eating bird activity.
Tarmac / concreted areas	Flat areas of footpaths/walkways or roads	Flat open areas attract loafing birds such as South Island pied oystercatcher, gull spp., rock pigeon and skylark.	The removal of grass and the creation of flat concreated areas may increase loafing bird activity but decrease seed eating bird activity.
Drains and trenching	Ponded water, open trenches/drains and mounded earth	Ponded water and open trenches and drains attracts gull spp., waterfowl spp., and pūkeko. Mounded earth attracts gull species.	The creation of drains/ trenches may attract waterfowl species to the site. However, site soils are expected to be fast draining.
Buildings	Flat rooftops and other structures that form perching and nesting areas	Flat perching areas attract species like Southern black backed gull, house sparrow, starling and rock pigeon.	The creation of rooftops may increase bird perching and nesting activity on site, but reduce feeding activity from the former grassland. A WHMP can inform ways to mitigate rooftop effects.

Table 3: High-risk habitats, Land Activities and their Attractance			
Area	**Habitat Type**	**Attractance**	**Developed site's potential impact**
Trees	Trees, shrubs, forest blocks (exotic and native), gardens and other ornamental vegetation	Vegetation creates breeding and perching areas for all avifauna.	Post-development, planted trees could create roosting and nesting habitat for birds. 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.
Open waterbodies	Ponds, streams, creeks, rivers, lakes, oceans and wetlands	Open waterbodies create feeding and loafing areas for waterfowl species, pūkeko, swamp harrier, and common pheasant.	The creation of stormwater basins could attract more waterfowl to the site, when the basins are full. However, they will only fill following a flooding event and infiltration is rapid meaning this will be rare.

9.0 Avifauna Strike Risk

Avifauna species numbers change season to season depending on migration times, food availability around agriculture and farming, and several other factors. Although our bird counts are a good representation of site species, these may vary between seasons and with changing agricultural practises and activities. We know that the species present at CIAL will also be present on the site and that their 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 1.

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.

9.1 CIAL High-risk Species

As described in Section 5.2 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, 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. In terms of the proposed development of the site, we expect that this will cause territory shifts of the swamp harrier locally present. They are likely to move to open farmland once works commence but still may use the site within their territories.

Rock pigeon movements around the CIAL airspace are becoming more of a concern especially during agricultural harvest time. CIAL classify rock pigeons as a high-risk species. They are medium sized birds, however their large flocking characteristics categorise them as a higher risk on the NZAWHG risk matrix. 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 (see Appendix B). 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.

Southern black backed gull is 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 aggressively 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).

9.2 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 site visit, 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.

9.3 CIAL Low-risk Species

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

10.0 Recommendations

Several recommendations to manage avifauna attractance and aviation strike risks have been provided in sections 10.1 – 10.3 below as per different phases of development works and align with CCDP provisions in Chapter 6.7. These include site and infrastructure design, and pre-development and post-development phases.

10.1 Site and Infrastructure Design

10.1.1 Storm Water Utility Reserve Design

Current site plans for the development of 104 Ryans Road have two stormwater utility reserves located at the eastern extent of the site (see CGL, Capture Plan Scheme Plans, 2025). These locations are preferred as they are furthest away from the CIAL flight path. Each stormwater utility is designed to be very fast draining (see below) and will therefore have a low attractance to waterfowl. In the unlikely event that birds are attracted to the utilities during short-term flooding, the eastern location will further minimise risks by ensuring birds are not active around the flight path.

Sizing based on current catchment areas indicates both stormwater basins would exceed 1,000 m^2 and are currently within 0.5 km of each other and therefore require resource consent under the CCDP (see Section 4.2). However, the two basins onsite will only fill during a flooding event. They are designed to hold water for no longer than 72 hours for an up to a 50-year rainfall event. In most rainfall events, the time to infiltrate all water to ground will be much less than this. In between rainfall events, the basins will be a dry grassed-covered depression.

The stormwater infiltration basins will be sized to hold and treat the first 25 mm depth of rainfall from the receiving catchment via infiltration through an engineered treatment media in the base of each basin.

Flows over and above this are diverted to rapid infiltration to ground via soakpits (PDP, 2025a). There are multiple similarly designed dry stormwater basins around CIAL. For example, 2.5km south of CIAL in the Mashan Block Development south of Yaldhurst Road.

Due to the design of the dry stormwater basins, we expect their attractiveness to waterfowl and other bird species attracted to water to be low risk. However, the depressed large flat areas my attract species like Southern black-backed gull (significant risk), spur-winged plover (moderate risk), red-billed gull (minor risk) and black-billed gull (neglectable) to roost, especially during high wind. These risks can be managed through a WHMP prepared in consultation with CIAL.

10.1.2 Site Rubbish Management

The development will not be used for fish processing or packing plants, abattoirs or freezing works. These all have the potential to increase bird strike risk and are controlled by the requirements of the CCDP.

A Rubbish Management Plan is recommended for managing operational, uncontained rubbish from the site. This would be included in a site WHMP (as recommended in Section 10.2.1), and would include a requirement that there be no open rubbish areas onsite. All rubbish should be contained in skips with lids to stop scavenging birds like rock pigeons, house sparrows and black-backed gulls.

10.1.3 Building and Infrastructure Design

Increasing the roof pitch of buildings can reduce avifauna roosting and nesting. However, pitched roof designs may be impractical for industrial buildings at the development site (e.g., due to building height restrictions) and other methods can be employed to deter birds from the area.

Building and infrastructure design should avoid creating ledges or rafters where birds can roost and nest/breed. If this cannot be avoided, bird spikes or bird slope sections should be used as a bird deterrent. The designs of industrial buildings where doors will remain open for prolonged periods of time should take into consideration that birds like rock pigeon, house sparrow and swallow often use internal building areas such as ledges and rafters to nest increasing site avian densities. Management methods such as rapid roller door shutters and bird netting can help avoid nesting inside buildings. Detailed management practice applications can be detailed in a WHMP.

Lighting designs in respect to avifauna effects has been discussed with a lighting consultant prior to development and are detailed in the PDP Lighting Management for Aerial Fauna Memorandum (PDP, 2025b). In summary, lights (blue hue lights in particular) attract insects and may increase bird attractance while feeding on insects and should be avoided. Other general rules and procedures for lighting are listed in 6.3 of the CCDP and are covered in the report by Pedersen Read.

10.1.4 Drainage

Standing water can increase avifauna present on the site. The site's proposed drainage system will reduce post-development runoff from pre-development flows by nature of isolation and disposal of run-off from individual lots (PDP, 2025a). If standing water is produced following a flooding event, mitigation should be put in place through techniques detailed in a WHMP as recommended in Section 10.2.1.

10.1.5 Landscape Design

Landscape planting at the site should consist of flora species with an open crown structure (i.e., an open arrangement of branches, leaves and reproductive structures). This discourages birds to roost and nest through a reduction in shelter within trees. Open planting, where trees are planted with increased distance between each tree, is favourable as crown structures do not overlap. This avoids the creation of more densely sheltered habitats. Flora species that provide minimal insect and avifauna food (flowers, fruit and seeds) should be also used. Planting low stature species should be preferred, especially to the

west of the site, close to the approach fan/OLS as they provide less surface area for nesting and roosting birds species.

Landscape designs and a Planting Plan for the development have been prepared by DCM Urban Design Limited as part of the Fast-track application. These have identified native and exotic plant species for street planting, a 3 m landscape buffer east and south of the site, and a stormwater management area. A review of the proposed designs has found that street plantings are located approximately 50 m apart, thus avoiding the overlap of planted specimens. The specimen trees identified for planting are upright red maple (*Acer 'bowhall)*, snakebark maple (*Acer davidii)* and Scarlet Oak (*Quercus coccinea)*. We consider these as the most suitable species to plant (i.e., to manage bird strike risk) due to their open and upright structures, and maturity height. This is especially important for the Western corner of the site close to the approach fan/OLS. These plant species are also deciduous making them less attractive to birds in Autumn to early-Spring.

Flora identified to be planted within the 3 m landscape buffer should all be low in attractance providing little food and nectar. Dense planting is required along Ryans Road and Grays Road to screen the industrial site from neighbouring properties. The most appropriate species for this is lemonwood (*Pittosporum eugenioides*) as this has small and relatively few seeds compared to other shelterbelt species. Lemonwood has been included as the screening plant species of choice in landscape plans. Flora species proposed for the stormwater management area are all of low attractance to birds.

10.2 Pre-development

10.2.1 Site Wildlife Hazard Management Plan

Prior to development, CGL will provide a site WHMP as part of their condition suite. The WHMP should be prepared in consideration of the CIAL WHMP to detail management methods to help reduce bird strike risk associated with the site and CIAL airport operations.

Specifically, the WHMP should outline:

- Pre-development mitiagations e.g., mowing site grass to disperse birds in a southward direction away from the CIAL flight path.
- Communication plan of development timelines with CIAL before development works take place to mitigate potential avifauna issues and offer support if any issues arise.
- Roles and responsibilities - includes liaising with external stakeholders (e.g., CIAL) to determine the obligations of respective organisations and their personnel.
- Passive and active management methods – surveillance and monitoring, grounds management specifications (i.e., recommended grass heights to deter high-risk species), and seasonal bird counts (this could be completed by CIAL and/or site surveillance personnel).
- Landscape and waterbody design standards and mitigations.
- Monitoring and review procedures of WHMP – this should include liaison with CIAL with increases in bird numbers onsite being communicated so appropriate counter-measures can be implemented.

10.3 Post-development

We recommend that continued use of a WHMP is utilised and a site/CIAL representative is assigned to conduct monitoring of the site, noting bird numbers, changes in abundance and the presence of 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.

11.0 Conclusion

It is our opinion that the effect of habitat change, created by the development at 104 Ryans Road, will not increase the level of bird strike risk for CIAL. It is proposed that there will be a reduction in scattered mature trees, removal of derelict buildings/structures, and an increase in human presence. We predict this will result in a decrease in overall bird presence.

There is likely to be a change in the relative abundance of bird species, with a reduction in small seed-eating birds and a possible increase in species that prefer urban environments like roof-tops such as Southern black-backed gull, red- billed gull and rock pigeon. As buildings will be primarily used for logistics and warehousing operations, and likely exclude industries with a high degree of bird food attractance, we do not expect that birds will be attracted to the area for foraging purposes. The characteristics of the stormwater basins should not result in any increase in avifauna water habitat attractancy due to fast infiltration rates, however the flat depressions could create roosting areas for spur-wing plovers and gull species that will need to be managed. Landscape planting plans include species that are of low attractance for roosting or feeding.

The use of a WHMP, utilised pre- and post-development in consultation with CIAL, will further ensure pre-development elements, including landscape planting, stormwater, and lighting designs, are well-informed with mitigated risk. The WHMP will also allow ongoing post-development wildlife hazard management mitigations with a planned approach. The assessment above has demonstrated that there are a range of options that can be included in a WHMP for the site that will ensure that bird strike risk will not increase as a result of the development.

12.0 References

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Appendix A – Project Team

The assessments outlined in this memorandum were undertaken by the following qualified ecologists:

Lizzie Civil (Avian Ecologist)

Lizzie is an Avian Ecologist with over 13 years of experience in the Aviation/Transport Industry, as well as conservation projects. She graduated from Unitech with a Bachelor of Science (Biodiversity) in 2011. She has been the chair of the New Zealand Aviation Wildlife Hazard Group (NZAWHG) since 2016. The NZAWHG works together to manage wildlife and human interactions and their associated risks around New Zealand Airports.

Lizzie has worked as an Airfield Manager and Grounds and Wildlife Manager for the New Zealand Defence Force and Auckland Internation Airport Limited, respectively. In these roles, she worked with airports across New Zealand to develop Wildlife and Pest Management Plans, Grounds Audits, Safe Operating Procedures, Recommended Practices and Risk Analysis in accordance with Civil Aviation Rules and Regulations. Prior to Pattle Delamore Partners, she worked as an independent ecological consultant conducting a range of tasks including monitoring assessments of avian biology behaviour.

Recently, Lizzie has created Wildlife Hazard Management Plans for Hamilton, New Plymouth, and Rotorua Regional airports. She has been working on two studies for Auckland International Airport investigating water and sediment quality effects on sea grass growth and its effects on the black swan population. She has also collated and analysed geospatial data for avian species movements to select an effective artificial shell roost location.

Lachie Davidge (Freshwater and Terrestrial Ecologist)

Lachie is an ecologist with three years of experience working in environmental consultancy. He graduated from the University of Otago with a Master of Science (Ecology) in 2023. He is affiliated with the New Zealand Ecological Society (NZES), New Zealand Herpetological Society (NZHS), and Society for Research on Amphibians and Reptiles in New Zealand (SRARNZ).

Lachie has expertise in terrestrial and freshwater ecology, pest plant and animal management, and restoration work. He has been involved in a wide range of work including freshwater assessments, bird surveys, lizard management works, wildlife hazard management, infill and riparian planting plans and implementation. Has been involved in several lizard habitat assessments and a successful lizard salvage and relocation project.

Appendix B – Significant Wildlife Habitats Around CIAL

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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

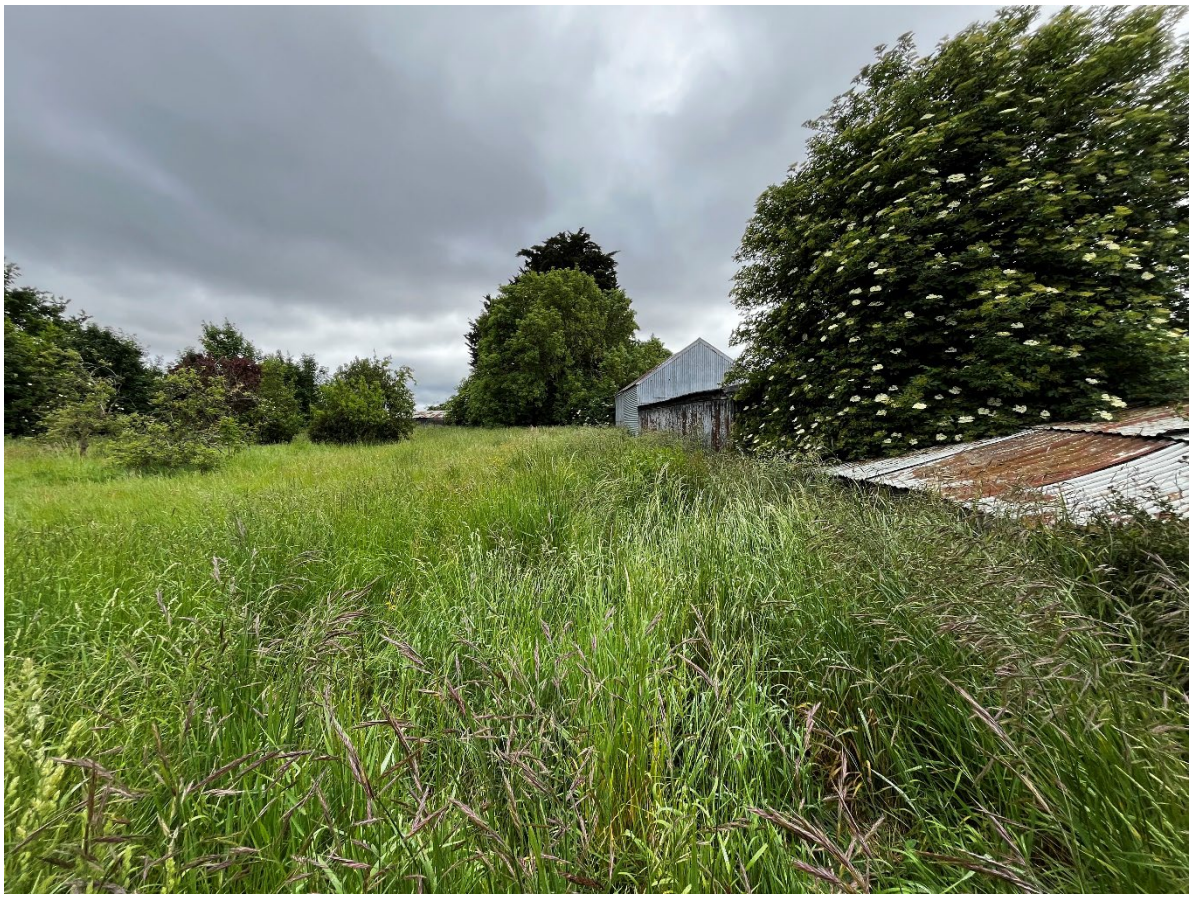
PROJECT
RYAN ROAD FAST TRACK PROJECT

Appendix C – CIAL Bird Strike Trend 2019-2024

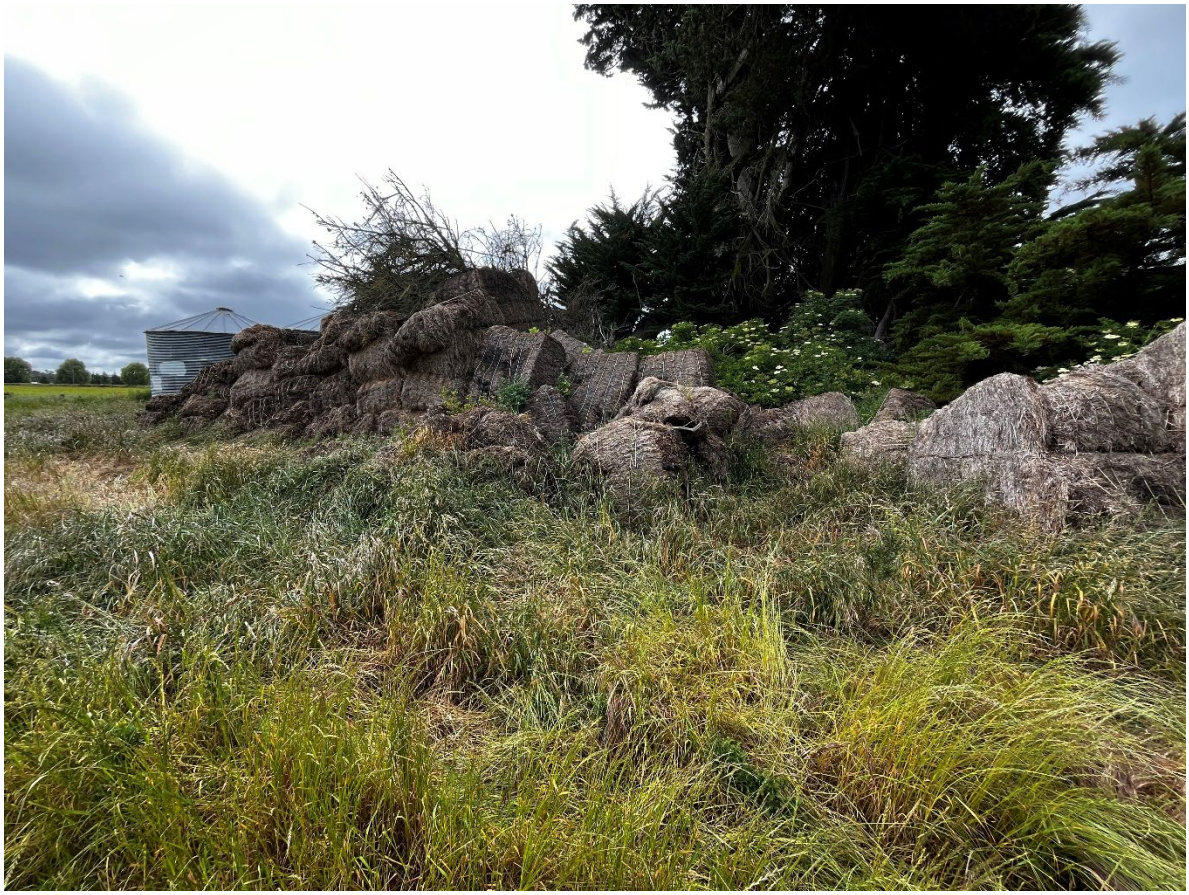
CIAL Bird Strike Trend 2019-2024			
Year	**Total Number of Strikes**	**Number of Strikes per 10,000 Movements**	**Comment**
2024	50	5.0	Bird species - 60% small, Starling size and below. 20% medium, SWP, Feral pigeon. 9% large SBBG, Hawk. Remainder unknown
2023	44	4.0	Bird species - 50% small, Starling size and below. 30% medium, SWP, Feral pigeon, BBG, SIPO. 10% large SBBG, Hawk, Mallard Duck. 5% Rabbit. Remainder unknown
2022	43	4.1	Bird species - 50% small, Starling size and below. 15% medium, SWP, Feral pigeon. 8% large SBBG. Remainder unknown
2021	25	3.4	Bird species - 60% small, Starling size and below. 5% medium, SWP, Feral pigeon. 0% large. 2% Rabbit. Remainder unknown
2020	36	6.3	Bird species - 70% small, Starling size and below. 10% medium, SWP, Feral pigeon, SIPO. 2% large Goose. Remainder unknown
2019	34	3.3	Predominantly sparrows, mix of other small birds and SBBG

Appendix D – Site Photographs

Appendix D-1: Rank grass found along the north-east fence line.

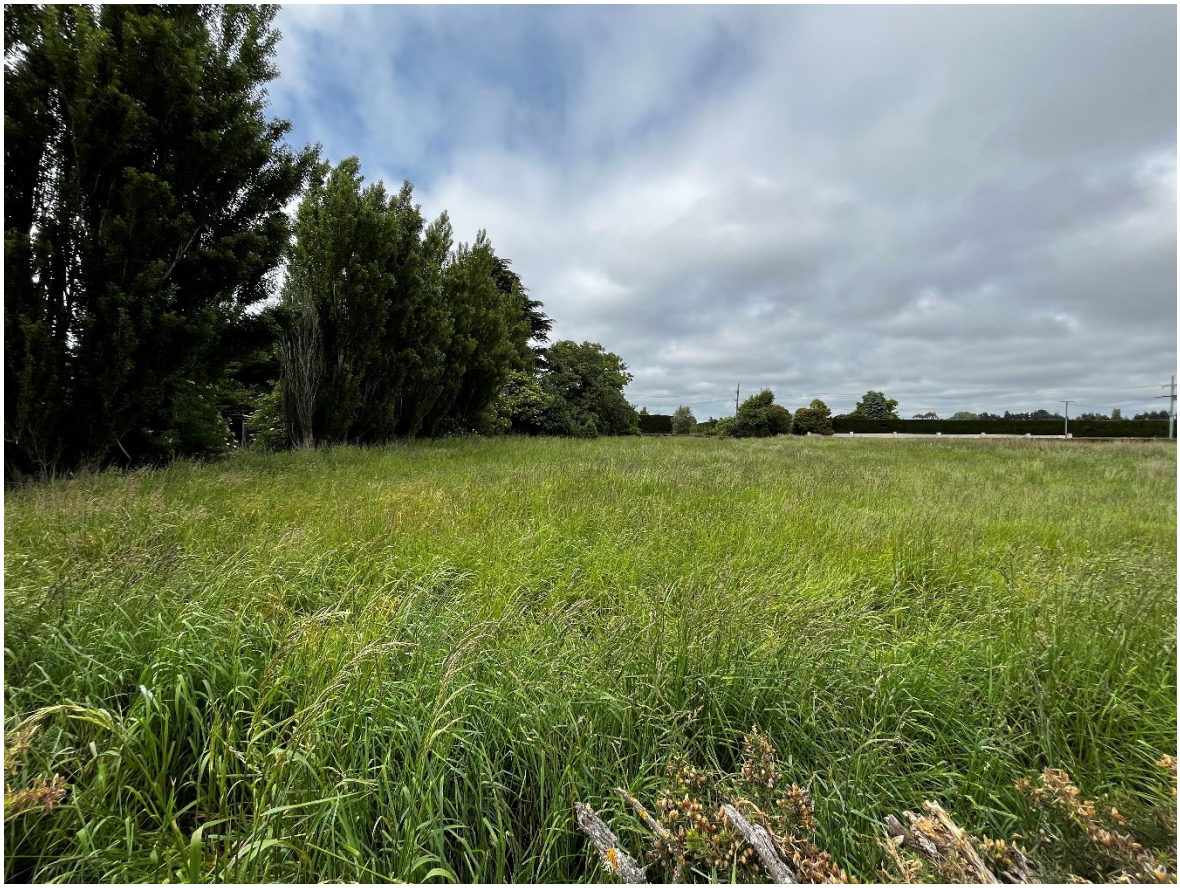


Appendix D-2: Rank grass extent found between the old farmhouse and farm buildings.



Appendix D-3: Rank grass, hay bales and dense vegetation present along the northern extent of the old farm buildings.

Appendix D-4: English ivy (*Hedera helix*) and leaf litter found along the eastern fence line adjacent to the old farmhouse.



Appendix D-5: Rank grass found along the northernmost fence line within the existing open pasture farmland.