

**Before the Hearing Panel Appointed by the
Christchurch City Council**

In the Matter of

the Resource Management Act
1991 (**Act**)

And

In the Matter of

Proposed Plan Change 19 to the
Christchurch City Council: Marshs
Road Industrial

**Statement of Evidence of
Elizabeth Hannah Civil (Avifauna)
for Calder Stewart Development Limited**

Dated: 2 October 2026

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INTRODUCTION

Qualifications and Experience

1. My name is Elizabeth Hannah Civil (née McGregor).
2. I hold a bachelor's degree in applied science from the Unitec Institute of Technology.
3. I am an Ecological Service Leader at Pattle Delamore Partners (**PDP**), with expertise in avifauna, particularly in operational and highly modified environments. Prior to joining PDP, I was Director of Civil Ecology Limited for approximately five years. I also held the positions of Airfield Manager and Airfield Environmental Manager at the New Zealand Defence Force (**NZDF**) Base at Whenuapai for approximately three years, and Airfield and Grounds Manager at Auckland International Airport (**AIAL**) for approximately seven years. I was also Chair of the New Zealand Aviation Wildlife Hazard Group (**NZAWHG**) for approximately eight years.
4. I am experienced in avifauna across a broad range of environments, with experience including ecological assessments, ecological monitoring, wildlife and pest management planning, and developing practical mitigation measures to manage ecological risks associated with infrastructure developments. I have experience assessing bird behaviour and habitat use to inform design and management decisions that balance operational requirements with ecological values.
5. I have approximately 14 years of professional experience as an ecologist. I have worked on several relevant ecological projects within New Zealand, including the following:
 - (a) Airport Wildlife Hazard Management Plans (**WHMP**) for New Zealand Airports including; Christchurch International Airport Limited (**CIAL**), Wellington International Airport Limited (**WIAL**), Palmerston North Airport Limited (**PNAL**), New Plymouth Airport Limited, Hamilton, Rotorua and Timaru.
 - (b) Expert evidence for building development neighbouring PNAL.
 - (c) Habitat and Bird Strike Assessments (**BSA**) for several developments and private landowners surrounding CIAL.
 - (d) BSA to inform Napier City Council Regional Park Masterplan design.
 - (e) Fast Track BSA and WHMP for Carter Group Limited neighbouring CIAL.

- (f) A number of projects for Queenstown Airport including airfield invertebrate, weed, grass and insect monitoring and planning, and ground, landscape and airfield reinstatement plan.
 - (g) Several projects for AIAL including impact of nutrient levels on seagrass expansion and black swan numbers in the Manukau Harbour and GIS analysis of avifauna strike and movement data to recommend future bird roost placement and design.
6. Calder Stewart Development Limited (**Calder Stewart**) has requested that I provide avifauna evidence in relation to Private Plan Change 19 (**PC19**), Marshs Road Industrial (the **Site**) also known as Hornby Quadrant Stage 5. PC19 seeks to rezone approximately 19.5 hectares of land from Rural Urban Fringe Zone (**RUFZ**) to Industrial Heavy Zone (**IHZ**) within the southern portion of the Site and Industrial General Zone (**IGZ**) across the northern portion of the Site, while retaining RUFZ of the residential properties fronting Main South Road and Marshs Road.

Code of Conduct

7. While this is not an Environment Court hearing, I have read and agree to comply with the Code of Conduct for Expert Witnesses in the Environment Court Practice Note 2023. This evidence is within my area of expertise, except where I state that I am relying on material produced by another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

SCOPE OF EVIDENCE

8. I have been engaged by Calder Stewart to provide evidence on avifauna strike risk to CIAL aircraft operations in relation to PC19 and the Site. The Site is located within the jurisdiction of Christchurch City Council (**CCC**) and outside of the 3 km Bird Strike Management Area (**BSMA**) identified in the Christchurch District Plan (**CDP**). In its submission, Christchurch International Airport Limited (**CIAL**) does not oppose PC19 in principle but has sought further information to assist in assessing whether the proposed rezoning may result in an increased bird strike risk to aircraft operations at CIAL, and whether any plan-level controls are required to appropriately manage that risk.
9. This evidence describes the existing avifauna environment, and the industrial environment surrounding the Site to the east and southeast. It also assesses the potential for the proposed rezoning and future industrial development to alter bird activity and movements, and the implications of an such changes for bird strike risk to aircraft operations at CIAL.

10. My evidence will deal with the following:
- (a) Executive summary:
 - (i) The Site.
 - (ii) Aviation best practice.
 - (iii) Christchurch District Plan rules.
 - (iv) Christchurch International Airport bird strike data and species of concern.
 - (v) Summary of available information of avifauna population, foraging, roosting, breeding habitats and behaviour of high strike risk species classified by CIAL. Land uses and their operations that are attractive to high-risk avifauna species.
 - (vi) Bird Strike Assessment and Habitat Assessment.
 - (vii) Summary of Site information.
 - (viii) Potential design, construction and operational phase effects of avifauna and bird strike risk.
 - (b) Response to CIAL submission.
 - (c) Response to section 42A Report.
 - (d) Conclusion.

EXECUTIVE SUMMARY

- 11. Calder Stewart has requested avifauna evidence in relation to PC19, which proposes to rezone approximately 19.5 hectares of land at Marshs Road, Christchurch from RUFZ to IGZ and IHZ. The request includes the rezoning of five large lifestyle blocks ranging from 2ha to 4ha in area.
- 12. The Site is located approximately 5.8 km from CIAL and approximately 1.5 km southeast of the direct 02/20 runway approach and departure flight paths.
- 13. This assessment considers the potential effects of PC19 and future industrial development on aircraft bird strike risk at CIAL.
- 14. A site assessment and bird count survey were undertaken by two PDP avian ecologists on 21 August 2026, including assessment of the Site and comparison

with established industrial areas to the east and southeast of the Site. The existing Site environment comprises of residential and agricultural land uses and supported greater bird activity than the established industrial areas surveyed. The survey results did not identify persistent roosting or congregation of species of high to moderate CIAL bird strike risk within the established industrial areas. The Site survey also did not identify bird movements from the Site towards CIAL or sustained bird flight activity at elevations approaching the typical aircraft operating altitudes in the vicinity of the Site.

15. The Site is outside the lower-altitude portion of the 02/20 approach and departure flight path, with aircraft operating in the vicinity of the Site at approximately 1,500–2,500 ft above ground level (AGL). The bird activity recorded at the Site was predominantly associated with ground-level or low-level foraging and localised movements. Based on the Site's location, aircraft operating altitudes, existing habitat, bird survey results, and the fact that the proposed rezoning represents a relatively small incremental change within a large existing industrial area, the rezoning is not expected to result in an increase in direct bird strike risk to CIAL aircraft operations.
16. The proposed IGZ and IHZ zoning would enable a range of industrial activities and associated development. Although the Site is outside the specific BSMA provisions, some activities enabled by the proposed zoning could, depending on their nature, design and operation, introduce bird-attracting resources or features. The potential for future development to create a secondary bird strike pathway has therefore been considered. Industrial development does not inherently increase bird strike risk; rather, the potential risk would depend on whether future activities, buildings or site operations create persistent food resources, roosting opportunities leading to bird aggregations, and whether associated bird movements could interact with aircraft operating areas.
17. The appropriate planning mechanisms for managing any identified bird strike risk effects is a matter of the planning and legal evidence. The matters in this evidence are from an ecological and bird strike risk perspective.
18. The CCC section 42A planning assessment acknowledges that bird strike requires management and mitigation and considers the CDP framework appropriate for managing these effects. However, the planning assessment does not specifically consider whether the activities and physical development enabled by PC19 could create bird-attracting resources or features, which is address in this evidence.

THE SITE

19. The Site is located approximately 5.8 km southwest of CIAL. The Site comprises predominantly flat, open grassland with limited vegetation structure, other than scattered trees along the middle and western edges of the Site and hedgerows associated with property boundaries. There are residential property blocks north and north-west of the Site and industrial areas east and south of the Site. Land uses within the Site include residential housing, lifestyle blocks and agricultural activities, including cropped and harvested fields, and grazing paddocks.

AVIATION WILDLIFE HAZARD MANAGEMENT BEST PRACTICE

20. International aviation guidance recognises that bird strike risk extends beyond the aerodrome boundary. International Civil Aviation Organisation (ICAO, 2020) recommends that airport operators identify and manage habitat features and land uses that attract wildlife, including features such as building rooftops and openings that may provide perching, nesting or roosting opportunities. Similarly, The Federal Aviation Administration (FAA, 2020) recommends that potential wildlife attractants be considered in relation to their proximity to airport aircraft movement areas and aircraft operating areas. Areas within approximately 13 km of an aerodrome may therefore warrant consideration in relation to wildlife hazard management, with particular attention given to areas close to the aerodrome and within aircraft approach and departure corridors (ICAO, 2020).
21. Bird strike risk is greatest during the take-off and landing phases of flight, when aircraft are operating at lower altitudes. FAA wildlife strike data indicate that approximately 61% of reported bird strikes involving fixed-wing civil aircraft occur during landing, 36% during take-off run and climb, and 3% during the en-route phase (FAA, 2026). The FAA also reports that approximately 70% of strikes occur between 0 and 500 ft above ground level (AGL) (FAA, 2026).
22. These findings highlight that land uses and bird activity outside an aerodrome boundary can still be relevant to aviation safety, particularly where they have the potential to attract species that regularly move through aircraft operating areas.

EXISTING BIRD STRIKE ENVIRONMENT – CIAL BIRD STRIKE DATA

23. The Civil Aviation Authority (CAA) collects bird incident data and makes this information publicly available. The data includes separate rates for bird strikes, near strikes and combined bird incidents for each aerodrome. These rates are expressed

as the number of incidents per 10,000 aircraft movements, allowing bird incident rates to be compared between aerodromes with different levels of aircraft activity.

24. CIAL's CAA bird strike rates for 2021–2026 are presented in Table 1 of **Annexure A**. The CAA five-year average bird strike rate for CIAL is 4.54 strikes per 10,000 aircraft movements (CAA, 2026). The annual bird strike rate has generally remained below the CAA threshold of 5 strikes per 10,000 aircraft movements, with this threshold exceeded in 2024.
25. CIAL's bird incident data for the period 2021–2025 was provided to me by the CIAL Apron and Wildlife Manager and independently reviewed. The data has been compiled from pilot reports, control tower (Airways) reports and additional observations recorded by CIAL Wildlife Rangers operating on the airfield. This data has been used in this evidence to inform the assessment of species-specific bird strike risk at CIAL.
26. I have not relied on the species risk matrix presented in CIAL's current Wildlife Hazard Management Plan (**WHMP**), as that WHMP is currently under review and modification, and does not incorporate the most recent bird incident data. The species risk assessment explained in paragraph 18 below and presented in this evidence has instead been undertaken using the available 2021–2025 incident data with the permission of CIAL's Apron and Wildlife Manager.
27. Table 2 in Annexure A identifies the CIAL species bird strike risk profiles, calculated using CIAL bird incident data for 2021–2025 and the New Zealand Aviation Wildlife Hazard Group (**NZAWHG**) hybrid risk assessment model. The model is based on the Allan Risk Model (Allan, 2006), which considers the likelihood and potential consequence of a bird strike to determine an overall species risk level. The likelihood component is based on the number of strike occurrences for each species, evaluated as a five-year rolling mean using airport-specific strike data. The consequence component considers factors including species body mass, flocking characteristics and behaviour, reflecting the potential severity of a strike involving that species.
28. For this evidence, I have considered the CIAL high- and moderate-risk bird strike species identified in the updated CIAL risk matrix, with particular focus on Southern black-backed gull (**SBBG**), European starling and feral pigeon. During 2021–2025, SBBG were involved in 17 of the 209 recorded bird strikes (8.13%), European starling in 18 (8.61%), and feral pigeon in 11 (5.26%).
29. These species are recognised as bird hazard species in the wider Christchurch environment and can utilise both rural and urban environments. Their ability to use a range of habitats and move between feeding, breeding and roosting areas is

relevant when considering potential changes in bird activity associated with the proposed PC19. SBBG and feral pigeons are of particular relevance to the potential secondary bird strike pathway identified in Paragraph 66 of this evidence due to their ability to utilise buildings and other structures for roosting and their potential to form larger aggregations, while European starling has also been considered due to its recorded strike frequency, moderate strike risk classification and building nesting behaviours.

Southern Black-Backed Gull

30. Southern black-backed gull *Larus dominicanus* is classified as Not Threatened under the Department of Conservation threat classification system. It is widespread and abundant throughout New Zealand and occurs across a broad range of coastal, river, agricultural, urban and modified environments.
31. SBBG are highly adaptable and opportunistic feeders, allowing them to make use of a range of natural and human-associated food sources. Environment Canterbury (ECan) estimates that the Canterbury population exceeds 100,000 birds, reflecting the species' high abundance and widespread distribution within the region (ECan, 2025).
32. In Canterbury, ECan undertakes active management of SBBG populations on braided rivers due to the significant pressure this species places on vulnerable braided-river birds, including black-fronted tern, black-billed gull, wrybill and banded dotterel, and has undertaken control operations on Waimakariri, Rakaia, Hurunui, Waiau Uwha and Ashley Rakahuri rivers (ECan, 2025).
33. Waimakariri River supports a substantial breeding population of SBBG and forms part of the wider braided-river environment in which the species is managed by ECan. ECan's Braided River Revival programme includes active management and monitoring of shorebird populations on Waimakariri River, including annual surveying, nest monitoring and predator control. The programme has also included development of a specific Karoro Black Backed Gull management strategy (ECan, 2026).
34. Monitoring of SBBG breeding populations along the lower Waimakariri River has been undertaken over several years. Previous surveys have recorded thousands of nests distributed across multiple breeding colonies along the river system.
35. The available monitoring indicates that SBBG are not restricted to individual breeding colonies but occur more broadly throughout the Canterbury landscape. Their ability to utilise riverbeds, agricultural land, urban areas and other modified

environments contributes to their widespread distribution within the region (Annexure A, Figure 1).

36. ECan's current management information describes SBBG as the most abundant of New Zealand's native gull species, with populations having increased substantially over the past century (ECan, 2025). Their high abundance, wide distribution and ability to utilise both rural and urban environments mean that SBBG are a species relevant to consideration of land-use changes within the wider Christchurch Airport environment.

Feral Pigeon

37. Feral pigeon, *Columba livia* is an introduced and naturalised species widespread throughout New Zealand and is well established throughout Canterbury. It occurs in both urban and rural environments and is highly adaptable, using buildings, bridges and other structures for roosting and nesting and a range of food sources.
38. Feral pigeons are relevant to aviation safety due to their ability to form large aggregations and move between roosting and feeding areas. CIAL identifies feral pigeon as a species of moderate strike risk and includes it within its off-airport wildlife monitoring programme. CIAL undertakes regular monitoring of sites within the wider airport environment, including locations up to 13 km from the airport (Annexure A, Figure 1).
39. Feral pigeon populations have increased in parts of the Christchurch urban environment, with CIAL identifying the species as an ongoing wildlife hazard requiring management (CIAL, 2026). The availability of suitable buildings and other structures for roosting, together with accessible food sources, can support local concentrations of pigeons (CIAL, 2024).
40. The wider Christchurch environment therefore supports feral pigeon populations across both developed and rural areas, with birds able to move between roosting, feeding and other suitable areas. The location and availability of these resources can influence local pigeon distribution and movements.

European Starling

41. European starling *Sturnus vulgaris Linnaeus* is an introduced and naturalised species, widespread in New Zealand, occurring throughout the country in open country, agricultural areas and towns. It is highly adaptable and commonly forages in pasture and other open areas, feeding on invertebrates, fruit and other food resources

42. Starlings are highly gregarious and can form large feeding and roosting flocks. Communal roosts may contain hundreds or thousands of birds, with birds travelling between roosting sites and surrounding feeding areas. Roosts may occur in trees, vegetation and built structures.
43. Starlings commonly nest in cavities and can utilise buildings and other artificial structures. Within the wider Christchurch Airport environment, CIAL identifies European starlings in association with property development, exposed or disturbed ground, rooftops, ledges, beams and rafters, and tree shelter belts and hedgerows. CIAL identifies property development as a potential attractant during site clearing and levelling, while structures and shelter belts may provide habitat throughout the year (CIAL, 2024).
44. European starling is therefore a widespread and adaptable species within the wider Christchurch environment, with the ability to utilise both open areas for foraging and vegetation or built structures for nesting and roosting.

CHIRSTCHURCH DISTRICT PLAN BIRD STRIKE MANAGEMENT PROVISIONS IN CONTEXT OF THE SITE

45. The purpose of the CDP bird strike provisions is to manage activities that may introduce new or additional habitat or attractants for birds, particularly where these could increase the movement of birds through aircraft flight paths and consequently the potential for bird strike.
46. The CDP identifies specific activities that have the potential to attract birds and increase bird strike risk. Within the BSMA identified in Annexure A, Figure 2, Chapter 6, Sections 6.7.4.3.1–6.7.4.3.6 provide specific provisions for the management of specific activities that create risk of bird strike, including fish processing or packing plants, abattoirs and freezing works, and associated storage, processing and disposal activities. The provisions also address the creation of new stormwater basins or other water bodies exceeding 500 m², including requirements relating to their design and stormwater management.
47. These provisions recognise that activities which introduce food sources, water or other resources attractive to birds may increase bird activity and consequently the potential for bird strike. The CDP therefore provides specific activity-status rules and standards for managing bird strike risk associated with specified activities within the BSMA.
48. The Site is located outside of the CDP BSMA, as a result there are no specific controls or protections that apply.

49. The proposed future rezoning of the Site to IGZ and IHZ does not constitute one of the specific activities addressed by the bird strike provisions in Chapter 6, Sections 6.7.4.3.1–6.7.4.3.6. However, Chapter 16 provides for a range of industrial activities within these zones, some of which may introduce bird-attracting resources or features depending on their nature, design and operation. The potential for these activities and associated development to alter bird activity and increase bird strike risk should therefore be considered.

PERMITTED ACTIVITIES WITHIN INDUSTRIAL ZONES

50. IGZ permits a range of industrial activities, including warehousing and distribution, service industries, trade and yard-based suppliers, food and beverage outlets, and other ancillary activities.
51. IHZ permits a broader range of industrial activities, including heavy industrial activity,¹ warehousing and distribution, service industries, food and beverage outlets, poultry hatcheries, and bulk fuel supply infrastructure, with these activities subject to the relevant CDP rules.

IDENTIFIED OFF-AIRPORT BIRD HAZARD SITES

52. The CIAL 2024 WHMP (Annexure A, Figure 3) identifies several off-airport locations within the Canterbury region that have the potential to support bird populations relevant to aviation safety. These include areas providing suitable feeding, breeding, roosting or wetland habitat, and are detailed below:
- (a) The Waimakariri River, north of the Site was identified as a key area for bird activity, providing breeding and roosting habitat for SBBG, as well as a corridor for wider bird movements through the Canterbury landscape.
 - (b) Agricultural areas north of Waimakariri River were also identified as supporting bird species of aviation relevance, with farmland, ponds and irrigation infrastructure providing feeding and habitat opportunities for SBBG, feral pigeons and Canada geese.

¹ Defined in the Christchurch District Plan as including blood or offal treating, bone boiling or crushing, dag crushing, fellmongering, fish cleaning or curing, gut scraping and treating, tallow melting, flax pulping, flock manufacture or teasing of textile materials for any purpose, wood pulping, storage and disposal of sewage, septic tank sludge or refuse, slaughtering of animals, storage, drying or preserving of bones, hides, hoofs or skins, tanning and wool scouring, the burning of waste oil in the open air or in any combustion processes involving fuel-burning equipment, open burning of coated or covered metal cable or wire, including metal coated or covered with varnish, lacquers, plastic or rubber, any activity with the potential to discharge asbestos to air, burning out of the residual content of metal containers used for the transport or storage of chemicals, the burning of municipal, commercial or industrial wastes, whether by open fire or the use of incinerators for disposal of waste, any industrial wood pulp process in which wood or other cellulose material is cooked with chemical solutions to dissolve lining, and the associated processes of bleaching and chemical and by-product recovery, and crematorium and embalming services.

- (c) Other locations identified included Peacock Springs, Roto Kohatu, The Groynes, Styx Mill Conservation Reserve and local golf courses, primarily due to the availability of wetland habitat, open short grass and water.
 - (d) Paparua pig farm and Riccarton Racecourse were identified as locations supporting feral pigeons, with food availability and suitable buildings or other structures providing opportunities for large aggregations and roosting.
53. Collectively, these locations demonstrate that bird activity within the wider Christchurch Airport environment is influenced by a range of natural and human-modified habitats, with species associated with specific food, water, breeding and roosting opportunities. However, the Site is not an off-airport location that has been identified in the CIAL WHMP as having the possibility to support bird populations.

BIRD AND HABITAT ASSESSMENT OF THE SITE

54. Land use within the CDP BSMA was assessed to understand the surrounding land-use context. Land to the east and southeast of CIAL is predominantly developed industrial and residential land. Land to the south comprises predominantly larger rural-residential properties. Land to the north, west and southwest comprises predominantly farmland, recreational parks, quarries and racetracks as well as those listed in 52 a-d above.
55. Two Christchurch-based PDP avian ecologists undertook a site and surrounding area assessment on 21 August 2026. Habitat assessments and bird count surveys were undertaken within the PC19 Site and the established industrial areas to the east and southeast of the Site (Annexure A, Figure 4). The assessment was undertaken to characterise baseline avian activity within the PC19 area and provide a comparison with neighbouring established industrial land uses.
56. Site bird count data (Annexure A, Table 3) was used alongside the CIAL WHMP, CAA bird strike data (Annexure A, Table 1) and CIAL bird strike data (Annexure A, Table 2). to provide context for species that may use the Site and surrounding area. The Site bird counts were not intended to quantify seasonal variation in bird abundance or provide a comprehensive annual assessment of bird use, as surveys were not conducted across differing seasons or weather conditions. Rather, they provide a point-in-time assessment of bird activity and habitat use, supported by the available longer-term CIAL bird and bird strike information.
57. Surveys commenced at sunrise under favourable weather conditions, with clear skies and minimal wind. These conditions are required for standard bird-count survey methodology because bird detectability and activity are generally favourable during the early morning and under settled conditions.

58. The Site comprises predominantly flat, open grassland with limited vegetation structure, other than scattered trees and several hedgerows on property boundaries. The Site provides agricultural land uses and habitats including, rank grass, cropped and harvested fields, and animal grazing paddocks. These habitats provide foraging opportunities for common open-country bird species such as European starling, Pūkeko and house sparrow.
59. The existing industrial area is predominantly developed, with limited vegetation comprising scattered trees and hedgerows, areas of open, well-maintained grass, and vegetation associated with individual properties and site boundaries. Five-Minute Bird Counts (**5MBC**), including birds observed on the ground and overhead, were undertaken at seven locations within differing habitats and properties within the PC19 Site, and six locations within existing industrial areas. Existing stormwater swales within the existing industrial areas were also assessed for avifauna use.
60. The number of survey locations differed between the two areas due to the distribution of suitable survey locations within the respective areas. The bird counts provide an index of bird activity and abundance. Accordingly, the results have been considered in conjunction with the number of locations surveyed and the mean number of birds recorded per survey location, rather than solely on the total number of birds recorded.
61. A total of 281 birds were recorded during all seven 5MBC within the PC19 area. Species identified as high risk to CIAL included SBBG, (8), while species identified as moderate risk included European starling (15). The most abundant species were house sparrow (108) and pūkeko (99).
62. A total of 108 individual birds were recorded during all six 5MBC within the surveyed established industrial areas. Species identified as high risk to CIAL included SBBG (12), while species identified as moderate risk included European starling (1). The most abundant species were house sparrow (60) and SBBG (12).
63. Bird abundance was greater within the PC19 area than within the surveyed established industrial areas. This difference was also evident when considered on a per-location basis, with a mean of approximately 40 birds recorded within the PC19 area, compared with approximately 18 recorded within the established industrial areas.
64. A greater number of birds were recorded in the PC19 area than in the surrounding industrial areas. This was considered to reflect the availability of open grassland, seed-head resources and food associated with agricultural harvesting.

65. Bird activity within the established industrial sites was generally limited to birds observed overhead or within vegetation located outside the industrial site boundaries. Limited bird activity was observed directly within the developed industrial areas.
66. Species considered as a high CIAL bird strike risk were recorded in both the PC19 area and the established industrial area. Eight SBBG were recorded within the PC19 area compared with 12 within the established industrial area.
67. All SBBG recorded during the assessment on both sites were observed overhead and passing through the surveyed areas. No SBBG were observed feeding, roosting or congregating within either area. No SBBG were observed roosting on roofs or other structures within the established industrial area. The origin, destination and purpose of these movements could not be determined from the survey.
68. All birds observed overhead during the survey in both areas were hovering and associated with the area surrounding areas. Birds were not seen moving toward CIAL or within or moving toward the direction the flight path.
69. The highest number of SBBG recorded within the established industrial area was five birds, observed overhead at each 5MBC location EX1 and EX2 (see Figure 4 in Annexure A). Although there may have been food opportunities associated with the surrounding industrial sites, this could not be determined from the survey locations because access to those sites was not available. However, as the SBBG were observed overhead, rather than feeding, roosting or congregating within the industrial area, the survey results do not establish that the industrial land use was attracting or supporting greater SBBG use than the existing agricultural environment.
70. The relevant consideration for PC19 is whether future industrial development would create new opportunities for SBBG present in the wider area to feed, roost or congregate, and whether this could alter their movements in relation to CIAL.
71. No feral pigeons were recorded during the site assessment. However, their absence during the survey does not indicate that feral pigeons are absent from areas surrounding the PC19 Site and existing industrial area or that they could not utilise the PC19 Sites following development.
72. European starlings were more abundant (15) within the PC19 area, this was due to long rank, seeded grass, hedgerows and harvesting activity providing food and shelter. Only 1 European starling was seen within the existing industrial area at 5MBC location EX5.

73. The existing industrial stormwater swales were dry, with no standing water, and were not observed to be used by avifauna during the assessment. At the time of the survey, the swales did not appear to provide a significant additional bird-attracting feature. However, their potential to attract birds may increase during or following rainfall events if the storm water systems do not comply with CDP rules and standing water is present.

RESPONSE TO SUBMISSIONS

74. CIAL submits that *“CIAL is not opposed in principle to PC19 but does not support it proceeding at this time. CIAL seeks that further information be provided to enable an informed assessment of whether the proposed rezoning can proceed without giving rise to increased bird strike risk to aircraft operations, and whether any plan-level controls are required to appropriately manage that risk.”*²
75. In response to CIAL's submission, I have considered the potential bird strike risk associated with PC19 based on the combination of bird species risk profiles, bird activity, behaviour, abundance, habitat, the proposed change in land use and its development, and the Site's proximity to aircraft flight paths and aircraft operating altitudes.
76. Bird strike risk cannot be assessed solely based on the number of birds recorded within the Site. Consideration must also be given to the species present, the potential for aggregations to develop, and the subsequent movements of those birds in relation to CIAL.
77. The Site is approximately 5.8 km from the centreline of the CIAL runway 02/20 and approximately 1.5 km southeast of the direct 02/20 runway approach and departure flight path. An analysis of the online Flight Path Noise (2026) website indicates that aircraft on arrival and departure in the vicinity of the Site operate at approximately 1,500–2,500 feet (ft) AGL. The Site is therefore not beneath the lower-altitude portion of the flight path where aircraft operate below 500 ft AGL. The location of the Site relative to the runway and aircraft operating areas and the elevations at which aircraft operate is relevant to the assessment of potential bird strike risk.
78. In considering potential bird strike risk, I have distinguished between direct and secondary bird strike pathways. Direct bird strike risk relates to the potential for birds using the Site to interact directly with aircraft operating in the vicinity of CIAL. Secondary bird strike risk relates to the potential for development of the Site to alter bird activity or movements in a way that could indirectly influence bird strike risk.

² Christchurch International Airport Limited (CIAL) (2026). *Submission on Private Plan Change 19 – Marshs Road Industrial*. Submission 3, 29 January 2026.

Direct Bird Strike Risk

79. The proposed change from open agricultural land to industrial land is expected to alter the composition and distribution of bird activity within the Site. The existing agricultural environment provides open foraging habitat for a range of common rural species, while industrial development could provide a different combination of foraging, perching and roosting opportunities, depending on the final building, landscaping and stormwater design.
80. The survey results do not provide clear evidence that species of high or moderate bird strike risk to CIAL, such as SBBG, European starling or feral pigeon, were using the established industrial areas because of the industrial land use. SBBG recorded within the industrial area were observed passing overhead, and no SBBG were observed roosting on buildings or other structures. No feral pigeons were recorded, and only one European starling was recorded. Accordingly, at the time of the survey, the established industrial environment did not appear to be creating a significant attractant for these species.
81. The potential change in bird strike risk from the PC19 Site baseline relates less to any potential increase in overall bird numbers and more to whether PC19 future development and its design could create new opportunities for CIAL high risk and other bird species to feed, perch, roost or congregate. SBBG and feral pigeons can utilise buildings and other structures and may form larger aggregations where suitable food and roosting resources are available. Building design, landscaping, stormwater management and site operations should therefore avoid creating features that could encourage use by birds and thereby create bird strike risk.
82. The construction phase has the potential to temporarily alter bird activity at the Site. Areas of exposed or recently disturbed ground associated with earthworks may provide accessible foraging opportunities for SBBG and other opportunistic species, as earthworks can expose invertebrates and other food resources. The extent and duration of any increase in bird activity will depend on the area and duration of exposed ground and the availability of food resources. Construction-phase bird activity is recommended to be managed through appropriate site planning, monitoring and, where necessary, active bird deterrence measures such as bird scarers or other suitable deterrent techniques, with input from a suitably qualified and experienced avian ecologist.
83. In my opinion, based on the Site's location, existing habitat, bird count results and comparison with surrounding industrial areas, and the fact that the proposed rezoning of the Site to IGZ and IHZ represents a relatively small incremental change within an established industrial environment, the proposed rezoning is unlikely to result in an increase in direct bird strike risk to CIAL. The Site is approximately 1.5

km southeast of the direct 02/20 runway approach and departure flight path, with aircraft operating in the vicinity of the Site at approximately 1,500–2,500 ft AGL. This places the Site outside the lower-altitude portion of the flight path, where aircraft operate below 500 ft AGL. The birds recorded during the Site assessment were predominantly species associated with ground-level or low-level foraging and movement. Birds observed flying overhead during the survey were generally hovering or undertaking localised movements associated with the Site and surrounding areas. No birds were observed travelling from the Site towards CIAL, or within the direct flight path or moving in the direction of the flight path. No sustained bird flight activity at elevations approaching the typical aircraft operating altitudes in the vicinity of the Site was observed during the survey. The distance of the Site from the runway and direct approach and departure flight path, together with the operating altitudes of aircraft in the vicinity, the predominantly low-level bird activity recorded at the Site, and the absence of observed bird movements from the Site towards CIAL during the survey, suggests that birds using the Site would be unlikely to regularly interact directly with aircraft. This is consistent with the finding that most reported bird strikes occur below 500 ft AGL.

Secondary Bird Strike Risk

84. Secondary bird strike risk relates to the potential risk arising from a change in bird behaviour or movement resulting from future development. For example, future development anywhere outside the BSMA could provide new or enhanced opportunities for feeding, perching or roosting, which may attract or support regular or large aggregations of birds. Birds may then make repeated movements between a site and other feeding, roosting or habitat areas. Where those movements extend beyond the Site and interact with aircraft operating areas, the development could indirectly contribute to an increased bird strike risk.
85. IHZ provides for a broader range of industrial activities, including food and beverage outlets, poultry hatcheries and the processing and slaughtering of animals, which are not permitted in the RUFZ. The potential for bird attraction varies between the activities enabled within the IHZ. Industrial and heavy industrial activities, warehousing and distribution, and service industries do not inherently create an increased bird strike risk. However, activities or operational practices may provide food or other resources attractive to birds. Food and beverage activities and poultry hatcheries have greater potential to provide bird-attracting resources, while other industrial activities may create such opportunities depending on the materials handled, waste generated, outdoor storage and associated site management. Buildings and associated infrastructure may also provide opportunities for birds to perch or roost.

86. IGZ also provides for a range of industrial activities, including warehousing and distribution, service industries, trade and yard-based suppliers, food and beverage outlets and other ancillary activities. The potential for these activities to increase bird strike risk is not uniform. Warehousing and distribution, service industries, trade and yard-based suppliers and other ancillary activities do not inherently create an increased bird strike risk. However, activities involving food, or the storage and handling of materials that may provide food resources could, depending on their operation, create bird-attracting resources.
87. Accordingly, the proposed change to IHZ and IGZ would provide for a broader range of industrial activities than the existing RUFZ, although it represents only a small incremental change within an established industrial environment. These activities can occur in all IHZ and IGZ, without BSMA controls.
88. The purpose of the CDP is to provide a planning framework for identifying and managing land uses that may attract or support bird species of aviation relevance and, collectively, increase bird strike risk to CIAL. The Site is at present treated like all other sites outside of the BSMA.

SECTION 42A REPORT

89. A review of the Planning Officer's Report (CCC, 2026) under Section (S) 42a of the Resource Management Act 1991 was conducted, and my interpretation of its conclusions is that the existing CDP provisions provide an established framework for identifying and managing bird-strike risk, and that if those provisions are followed, the effects are considered to be appropriately managed from a planning perspective. They are not saying there is no bird-strike risk, rather, they appear to consider that the existing provisions already provide an appropriate level of management and therefore do not see a need for additional provisions through PC19 without new evidence.
90. The S42A Report does not, however, provide a site-specific assessment of whether the activities and physical development enabled by PC19 could alter bird activity or create additional bird-attracting resources or features that could influence bird strike risk at CIAL. This is the focus of the matters considered in this evidence.
91. Rezoning the Site from RUFZ to IHZ and IGZ could create a bird strike risk if future activities permitted within the zone introduce bird-attracting resources. The risk on the Site may not, however, be any greater than any other IHZ or IGZ zoned land outside of the BSMA. For example, activities involving food processing, packaging, or storage of food products could, depending on their nature and operation, provide opportunities for scavenging birds to access food resources or waste.

92. These matters are considered in this evidence from an ecological perspective, including the potential bird-strike effects associated with activities and development enabled by PC19. The appropriate planning mechanism for managing any identified effects is a matter for the planning and legal evidence.

CONCLUSION

93. The Site visit and comparison with the surrounding established industrial areas indicate that at the time of our survey the existing PC19 residential and agricultural environment currently supports greater bird activity than the established industrial environment. The proposed change of the Site to IGZ and IHZ is therefore likely to alter the composition and distribution of avian activity, as well as the types of resources available to birds. This comparison is based on the existing environments surveyed and does not predict how birds may respond to the future development of the PC19 Site. The future provision of food and waste sources that attract foraging birds and perching and roosting opportunities associated with the detailed design and operation of the development of the Site is therefore considered separately in assessing the potential secondary bird strike risk.
94. The survey results do not indicate that the established industrial areas currently support persistent roosting or congregation of species of high to moderate CIAL bird strike risk such as SBBG, feral pigeon or European starling.
95. The potential for PC19 and future industrial development to increase bird strike risk to CIAL aircraft operations, depends on whether future zone permitted activities, building design and Site operations create bird-attracting resources or features that result in persistent or large aggregations of aviation-relevant species and associated movements in relation to CIAL. Future development should avoid creating conditions that support regular or large aggregations of birds through the management of readily available food resources, waste, feeding opportunities or suitable perching and roosting structures. I recommend that these matters are appropriately considered through the planning mechanisms identified through planning and legal advice.
96. I believe the direct bird strike risk to CIAL aircraft operations is unlikely to increase with the proposed rezoning, based on the Site's location approximately 5.8 km from CIAL, its separation from the 02/20 approach and departure flight path, the aircraft operating altitudes in the vicinity of the Site, and the bird survey results. Birds using the Site would therefore be unlikely to regularly interact directly with aircraft operating in this area. The proposed rezoning to IGZ and IHZ represents a small incremental change within an established industrial environment, although it would provide for a broader range of industrial activities than the existing RUFZ. There is

therefore potential for a secondary bird strike pathway if future development provides suitable food sources or facilitates persistent feeding, roosting or congregation of flocking species, resulting in repeated movements between feeding and roosting areas. The significance of this pathway would depend on the species involved, the number of birds using the Site, the size and persistence of any aggregation, potential cumulative changes within the wider airport environment, and the frequency and direction of associated movements in relation to CIAL.

97. The CCC planning assessment acknowledges that bird strike is a matter requiring management and mitigation and considers that the CDP provides an appropriate planning framework for managing bird strike effects. The site-specific assessment undertaken for PC19 supports this approach by identifying that the proposed rezoning is unlikely to increase direct bird strike risk, while recognising a potential secondary bird strike pathway associated with future activities, building design and Site operations. I recommend that these potential effects are appropriately considered and managed, with the appropriate planning mechanism for doing so being a matter for the planning and legal evidence.



Elizabeth Hannah Civil

2 October 2026

ANNEXURE A

Table 1: CAA Average Quarterly, Annual and 5-yearly Bird Strike Rate

Table 1: CAA Average Quarterly Bird Strike Rate 2022-2026					
Year	2022	2023	2024	2025	2026
Q1	5.04	2.65	4.22	3.79	3.99
Q2	4.38	3.35	6.19	4.31	Not available
Q3	6.24	3.22	4.47	3.05	Not available
Q4	4.12	6.27	6.70	6.94	NA
Annual Average Bird Strike Rate ¹	4.95	3.85	5.41	4.52	3.99
5-yearly Average Bird Strike Rate	4.54				
Notes:					
1. Annual Average strike rate per 10,000 aircraft movements.					
2. Table data is sourced from the CAA website on 1 September 2026					
3. Bird statistics are inclusive of all runways					
4. Bird Strike Trend Categories:					
– Low where the rate is less than 5 strikes per 10,000 movements.					
– Medium where the rate is above 5 strikes per 10,000 movements but less than 10 strikes per 10,000 movements.					
– High where the rate is above 10 strikes per 10,000 movements.					

Table 2: CIAL Species Risk Assessment Matrix – calculated using CIAL 2021-2025 bird strike data.

CIAL Species Risk Assessment Matrix						
Likelihood	Consequence					
		Very Low e.g., solitary small passerines <50 g	Low eg., small flock <0.5 kg	Moderate eg., small medium flock, 0.5 kg-2 kg	High eg., large flock, 2 kg-4 kg	Very High eg., large flock >4 kg
	Very High >10 strikes/yr					
	High 3-10 strikes/yr	House Sparrow, SWP, Welcome Swallow	Starling	Southern Black- Backed Gull		
	Moderate 1-2.9 strikes/yr	Swamp Harrier, Skylark, Goldfinch	Back-billed Gull, SIPO	Feral Pigion		
	Low 0.3-0.9 strike/yr	Black Bird	Black-fronted Tern			
	Very Low <0.2 strikes/yr	Yellow Hammer				Canadian Goose, Mallard Duck
Low Risk: (greens) effective mangement. Routine monitoring only						
Moderate Risk (yellow): acceptable but requires active monitoring						
High Risk (orange): take action to reduce risk						
High Risk (red): take immediate action to reduce risk						

Figure 1: Known feral pigeon and SBBG locations that contribute species transiting CIAL within CDP Bird Management Areas (3, 8 and 14 km) Wildlife Hazard management Plan. P 47 (2024).

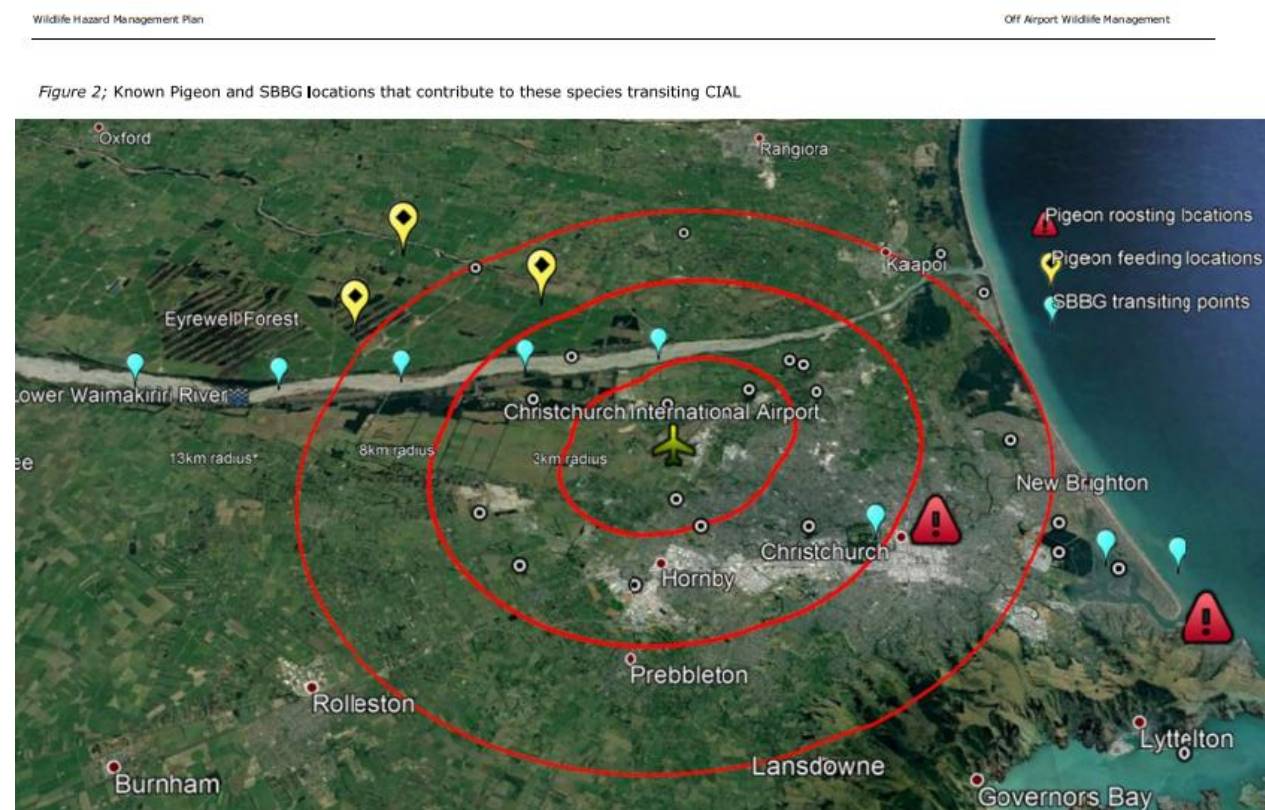


Figure 2: CCC District Plan GIS showing CIAL runways (brown), the operative 3 km BSMA (red), and the Site (black). The figure also shows the measured distance from the CIAL 02/20 runway centreline (orange and white). The non-operative 8 km Bird Strike Management Area is also shown for reference.



Figure 3: Christchurch Airport surrounding features and off-airport bird hazard locations within CDP Bird Management Areas (3, 8 and 14). *CIAL Wildlife Hazard Management Plan (2024)*, Figure 1, p. 59.

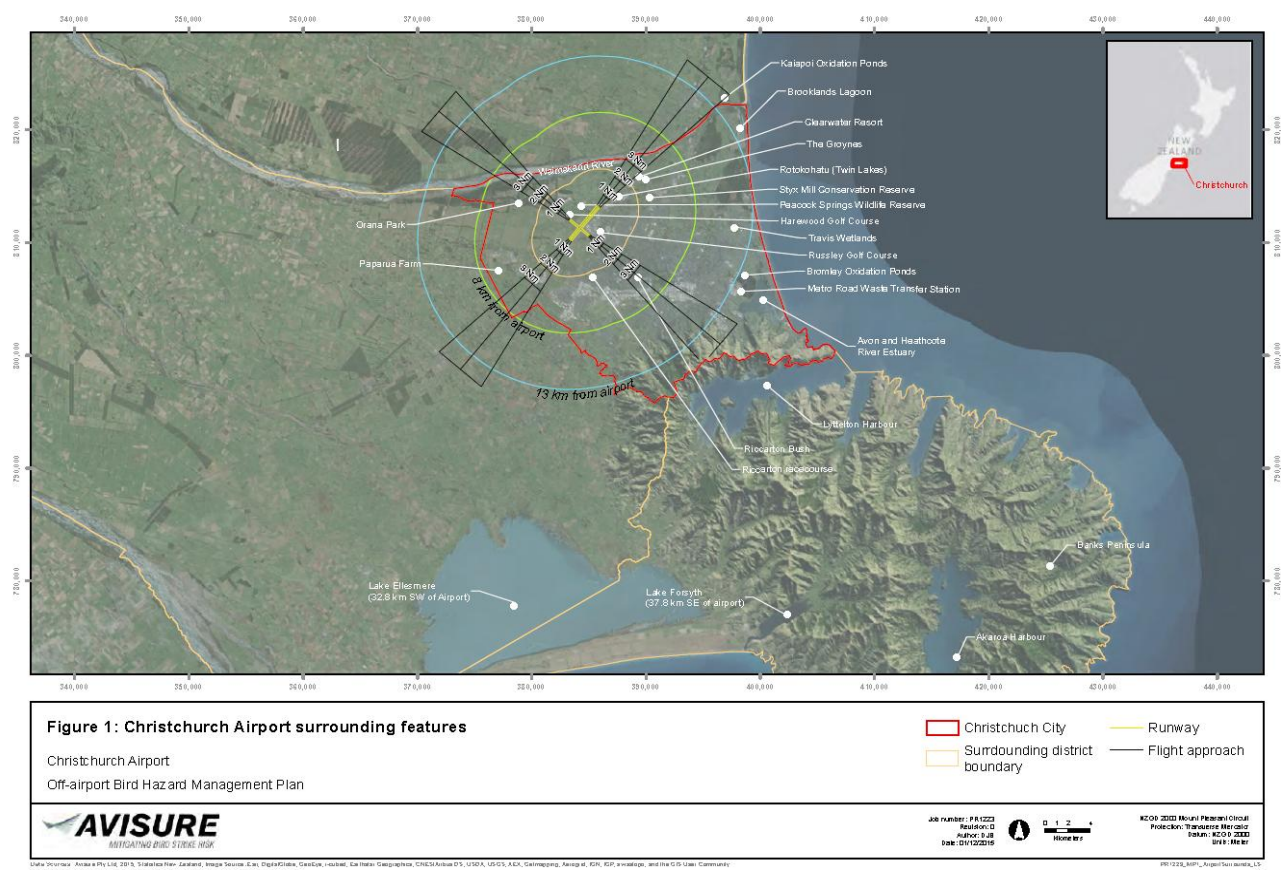


Figure 4: PC19 Area (yellow and orange), Retained Rural Urban Fringe Zone (green), Proposed Industrial General Zone (yellow) Proposed Industrial Heavy Zone (orange), stormwater swales (light blue) and bird count locations (green and orange).

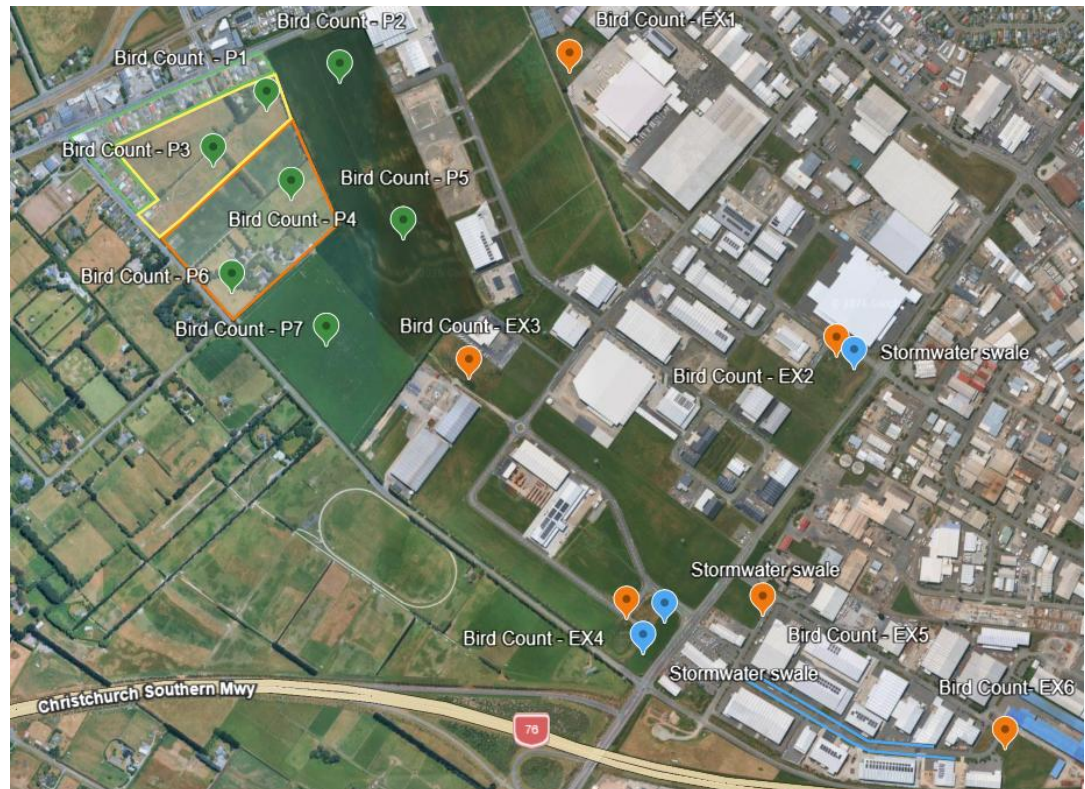


Table 3: Five-Minute Bird Count Data, species counted within PC19 area (P1-P7) existing industrial area (EX1-6), over all species totals per site, bird activity totals per count location, bird activity mean per count location and overall area, and CIAL bird species strike risk (green- low, yellow – moderate and orange – high).

21/08/2026	P1	P2	P3	P4	P5	P6	P7	Overall PC19 Species Total	EX1	EX2	EX3	EX4	EX5	EX6	EX Total	Overall Existing Industrial Species Total
Canada Goose				1				1							0	2
Chaffinch			7					7							0	14
Dunnoek								0	1						1	1
Blackbird	2		1			3		6		2		1			3	15
Fantail						2		2							0	4
Greenfinch								0	1						1	1
Sparrow	11	40	13	12		8	24	108	2	2	50		5	1	60	276
Magpie			2					2		1					1	5
Paradise Shelduck					4		2	6			4				4	16
Pukeko	3		1	22	3	30	40	99			4				4	202
Kingfisher			2					2							0	4
Silvereye			2				1	3	1	1					2	8
Skylark			6	2		4	2	14	2	4	1	3	3		13	41
Thrush	1		2		1			4							0	8
SBBG				1	5		2	8	5	5	1	1			12	28
SIPO					2			2			2				2	6
SWP							2	2				1	1	2	4	8
Starling						12	3	15					1		1	31
Swamp Harrier			1					1				1			1	3
Activity Totals	17	40	37	37	15	59	76	281	12	15	62	7	10	3	109	
Mean Activity Total	2.4	5.7	5.3	5.4	2.1	8.4	11	40	2	2.5	10	1.2	1.7	0.5	18	

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