

**Before the Hearings Panel
At Wellington City Council**

Under Schedule 1 of the Resource Management Act 1991

In the matter of the Proposed Wellington City District Plan

**Statement of evidence of Rachel Katherine McClellan on behalf of Wellington
City Council (bird strike)**

Date: 31 October 2024

INTRODUCTION:

- 1 My full name is Rachel Katherine McClellan. I am a self-employed consultant specialising in bird ecology.
- 2 I have prepared this statement of evidence on behalf of the Wellington City Council (the **Council**) in respect of technical related matters arising from the submissions and further submissions on the Proposed Wellington City District Plan (the **PDP**).
- 3 Specifically, this statement of evidence relates to the bird strike risk plan provisions proposed by the Wellington International Airport Limited.
- 4 I am authorised to provide this evidence on behalf of the Council.

QUALIFICATIONS AND EXPERIENCE

- 5 I hold the qualifications of PhD in Zoology from Otago University for research on the ecology and management of tarāpuka|black-billed gull in Southland (2009), and Master of Conservation Science from Victoria University for research on the breeding biology of toanui|flesh-footed shearwater on Karewa Island, Bay of Plenty (1996).
- 6 I have been a consultant since 2009. I was Office Manager and Senior Ecologist with Wildland Consultants in Christchurch, and later, Principal Ecologist based in Wellington. I have been self-employed since mid-2022. I have also worked for BirdLife International, in Cambridge, UK.
- 7 My work has included survey and monitoring, assessments of effects, threatened species monitoring and management, development of ecological significance criteria, and strategic and restoration plan development and implementation.
- 8 I have been involved in the assessment, monitoring and management of bird strike for 15 years. I have worked on multiple wind farm projects

– assessment of effects on birds, and development, implementation and peer review of bird strike monitoring programmes – including Long Gully (Wellington), Castle Hill (Wairarapa), Turitea (Manawatū), Mt Cass and Hurunui (Canterbury), Blue Skin Bay (Dunedin), Waipipi (Whanganui), and Slopedown (Southland). I have also worked on bird strike issues at Rotorua Airport, and for Christchurch City Council and Waimakariri District Council regarding Christchurch International Airport’s requests for bird strike provisions in their respective district plans.

- 9 I have written or co-authored over 70 reports, and presented evidence at over 20 council, Environment Court, and tribunal hearings.
- 10 I am a member the Ornithological Society of New Zealand (Birds New Zealand).

Code of conduct

- 11 I have read the Code of Conduct for Expert Witnesses set out in the Environment Court's Practice Note 2023. I have complied with the Code of Conduct in preparing my evidence and will continue to comply with it while giving oral evidence before the Environment Court. My qualifications as an expert are set out above. Except where I state I rely on the evidence of another person, I confirm that the issues addressed in this statement of evidence are within my area of expertise, and I have not omitted to consider material facts known to me that might alter or detract from my expressed opinions.

SUMMARY

- 12 My name is Rachel McClellan.
- 13 I have been asked by the Council to provide rebuttal evidence in relation to bird strike risk.

14 My statement of evidence addresses Wellington International Airport Limited's request for rules for certain land uses that are considered to increase bird strike risk at the airport.

INVOLVEMENT WITH THE PROPOSED PLAN

15 I have been involved in the PDP since October 2024.

SCOPE OF EVIDENCE

16 My statement of evidence addresses the following matters:

16.1 Bird strike risk at Wellington Airport

16.2 The bird species that are considered to have the highest risk profile at Wellington Airport

16.3 The origin of the 3km, 8km, and 13 km bird strike management circles

16.4 Recommendations for rules to manage bird strike risk in the PDP.

17 I have reviewed the briefs of evidence of Dr Michael Anderson, Ms Kirsty O'Sullivan, and Mr Jack Howarth, for Wellington International Airport Limited.

BIRD STRIKE

18 Birds in flight can collide with aircraft, potentially causing aircraft damage, and at worst, causing loss of human life. A global review of aircraft bird strike studies and statistics states that 2-8% of recorded bird strikes result in aircraft damage, and that bird strikes cause annual losses of at least one billion US dollars to the worldwide commercial aviation industry. As of November 2019, bird strikes were determined

to have caused the loss of 618 aircraft and resulted in 534 fatalities since the beginning of aviation¹.

19 The severity of the damage to aircraft is largely the result of a combination of the speed of the aircraft at the time of the collision, the size of the birds involved (the larger the bird, the greater the potential for damage), the number of birds involved (e.g., a single bird versus a flock of birds), and the part of the aircraft hit.

20 Internationally, certain land uses near airports, such as general waste landfills, are recognised as having the potential to increase bird strike risk. This can be from the provision of food sources, roosting habitats, and/or breeding habitats that increase numbers of birds close to airports, leading to flight paths that cross runways or take-off and landing approaches. This has led to the regulation of certain land uses in proximity to airports to manage bird strike, often within specified distances. For example, the Federal Aviation Administration (FAA) in the United States recommends variously avoiding, eliminating, or mitigating “hazardous wildlife attractants” [land uses] within:

- 10,000 feet for airports serving turbine-powered aircraft, and
- Five miles for all airports to protect approach, departure, and circling airspace².

These distances are equivalent to 3 km and 8 km from the runways.

21 The Civil Aviation Authority of New Zealand (CAA) published advice in 2011 on wildlife hazard management at airports³. The 2011 advisory

¹ Metz I.C., Ellerbroek J., Mühlhausen T., Kügler D. and Hoekstra J.M. 2020: The bird strike challenge. *Aerospace* 7: <https://doi.org/10.3390/aerospace7030026>. References within.

² FAA 2020: Advisory Circular No: 150/5200-33C - Hazardous Wildlife Attractants on or near Airports.

³ Civil Aviation Authority of New Zealand 2011: Advisory Circular QC139-16 – Wildlife Hazard Management at Aerodromes.

circular encourages airports to make submissions during urban planning or district plan reviews on land uses near airports, and to work with landowners and local authorities to manage bird strike risk. The advice emphasises the importance of reporting bird incidents to enable informed assessments of risk. However, the advice does not include any specifications on distances within which bird strike management, or regulation of land uses, should occur.

22 The CAA advice highlights multiple “hazardous land use practices” which may lead to birds making regular flights across aerodromes if they are near. The land uses are:

- Landfills – considered the greatest problem at many aerodromes
- Wastewater treatment plants
- Agriculture (crops and animals)
- Recreational activities, including golf courses, sports fields and parks, fishing and boating.

An earlier CAA guidance document from 2008 lists a larger number of hazardous land practices (Mr Jack Howarth’s evidence, paragraph 4.6).

BIRD STRIKE AT WELLINGTON AIRPORT

23 Wellington Airport is surrounded by habitats that support significant bird populations. The airport sits between Cook Strait and the Pacific Ocean immediately to the south and Te Whanganui-a-tara | Wellington Harbour immediately to the north. Extensive areas of coastline surround the airport and include a marine reserve and two predator-free islands.

- 24 The Zealandia Wildlife Sanctuary is approximately 6 km in a straight line from the airport, and the Miramar Peninsula is now considered to be largely rat, stoat and weasel-free. Combined with the efforts of 'Capital Kiwi' to the west of the city, and the extensive network of community pest control programmes throughout the wider region, it is entirely likely that, in time, Wellington City and its airport will be at the centre of what is in essence a very large wildlife refuge. Greater Wellington Regional Council's bird monitoring programme demonstrates significant increases in native bird populations since 2011. For example, counts of tūi have increased by 93%, kākā by 170%, and kererū by 243%⁴.
- 25 Large areas of maintained grass are located all around the airport which provide both food and roosts for a variety of bird species. Sites within only one kilometre of the airport include the Miramar Golf Club on the airport's eastern boundary, school fields associated with Rongotai College, Evans Bay Intermediate, Miramar Central School, Scots College, and other green space such as Kilbirnie Park. Bush and farmland cover non-residential areas.
- 26 The Southern Landfill lies five kilometres to the west of the airport and Mōa Point wastewater treatment plant is only a few hundred metres from the southern end of the runway.
- 27 Despite this, the CAA's most recent national quarterly report on bird strike (data up to June 2024) states that Wellington Airport has a 'Low' bird strike rate (less than five bird strikes per 10,000 aircraft movements), which is presently considered stable⁵.

⁴ McArthur N., Flux I. and Harvey A. 2024: State and trends in the diversity, abundance and distribution of birds in Pōneke / Wellington City. Client report prepared for Greater Wellington Regional Council, Wellington.

⁵ <https://www.aviation.govt.nz/safety/safety-advice/safety-reports/#Bird-incident-rate-reports>

- 28 Dr Anderson provides approximately 11 years of bird strike and near bird strike data from Wellington Airport in his evidence (23 October 2024). Data show that the native southern black-backed gull | karoro has a very high strike rate (134 strikes over ~11 years) compared to every other species. Starlings, spur-winged plovers, house sparrows, ‘finches’ (several small, introduced species), and rock pigeons all have similar strike rates of approximately 20-30 strikes over ~11 years. Waterfowl are rarely encountered, with one ‘goose’ and one mallard struck in 11 years.
- 29 The evidence of both Dr Anderson and Ms Kirsty O’Sullivan refer to Wellington Airport’s use of the Allan Risk Assessment method to describe the risk that different bird strike species pose to aircraft. This method was developed in the UK in 2006 and was reviewed by the original author in 2016⁶. The process combines an estimate of the probability of a strike occurring with a particular bird species (using the airports strike record over the past five years) with an estimate of the likely severity of the outcome of the strike incident (using the proportion of strikes with that species resulting in aircraft damage); the table below sets out how to use the Allan Risk Matrix (from Allan *et al.* 2016).

Table 1
Showing the category boundaries for the probability and severity measures used to position bird species in the risk assessment matrix (after Allan (2006)).

(a) Probability categories					
5-year rolling mean of no. of strikes per year for each species (airport data)	>10	3–10	1–2.9	0.3–0.9	0–0.2
Probability category	Very high	High	Moderate	Low	Very low
(b) Severity categories					
Percentage of strikes with a species causing damage (national data)	>20%	10–20%	6–9.9%	2–5.9%	0–1.9%
Severity category	Very high	High	Moderate	Low	Very low

- 30 However, the risk matrix shown in Dr Anderson’s evidence (his Figure 1) appears to be only loosely based on the Allan Risk Assessment. Firstly, it does not appear to use the same probabilities as

⁶ Allan J., Baxter A. and Callaby R. 2016: The impact of variation in reporting practices on the validity of recommended birdstrike risk assessment processes for aerodromes. *Journal of Air Transport Management* 57: 101-106

the Allan Risk Assessment which would have ranked goose species and mallard in the lowest probability category. The airport's risk matrix has also categorised the probability of strike with black-backed gull as equal to the strike rate of spur-winged plover, starling and house sparrow when it is considerably higher. Regarding severity of strike, it uses six weight categories instead of five damage categories.

31 Nevertheless, the airport's risk matrix clearly shows that black-backed gull is the key species of concern at the airport. Other species such as Canada goose, mallard, spur-winged plover, starling, and house sparrow may all have lower risk categories if the Allan Risk Matrix methodology had been closely adhered to.

32 In summary, Wellington Airport considers black-backed gull to have an 'Extreme' risk rating, no species are in the 'Very High' risk category, and spur-winged plover, feral pigeon, mallard and goose species are in the 'High' risk category. These are the species I will address in my rebuttal evidence.

SUMMARY OF WELLINGTON AIRPORT SUBMISSION

33 The airport is requesting the establishment of a 'bespoke' framework in the District Plan that sets rules for specific land uses or activities within a fixed distance of Wellington International Airport that are considered to increase the risk of bird strike at the airport.

34 However, the definition for Bird Strike Risk Activity is not set out in Ms O'Sullivan's evidence.

35 The Mitchell Daysh Limited memorandum dated 17 September 2024 states the following: "Bird Strike Risk Activity means a new or extension to an existing:

- a. Permanent artificial water body resulting in a surface area exceeding 1,000 m²

- b. Marine food processing activity with external food storage or waste areas accessible to birds
- c. Sewage treatment and disposal facility
- d. Abattoir or freezing works
- e. Landfill, waste management facility or composting facility.”

36 In contrast, Dr Anderson’s evidence states (paragraph 10), “Specifically, these activities include:

- a. Refuse dumps and landfills
- b. Outdoor sewage treatment and disposal
- c. Cattle feed lots
- d. Pig farming
- e. Fish processing
- f. Artificial and natural lakes/waterbodies
- g. Abattoirs and freezing works.”

37 Mr Howarth’s evidence refers to a third list; CAA’s list of potentially hazardous activities (paragraph 4.6):

- a. Refuse dumps and landfills
- b. Sewage treatment and disposal
- c. Agricultural – cultivation of land, types of activity e.g. pig farming

- d. Fish processing plants
- e. Cattle feed lots
- f. Wildlife refuges
- g. Artificial and natural lakes
- h. Animal farms
- i. Abattoirs and freezing works

But then indicates that he and Dr Anderson have refined the list to those that pose risk in a Wellington context, which has removed some activities such as agriculture and wildlife refuges (paragraph 6.15).

38 Dr Anderson states that he supports the bird strike rules regarding particular land uses proposed by the airport (his paragraph 27), and so I will work with the definition put forward in the memorandum dated 17 September 2024 (see my paragraph 35).

39 Ms O'Sullivan's evidence summarises and discusses the tiered approach where specified land uses are regulated according to their distance from the airport runways. These 3 km, 8 km, and 13 km circles are not bespoke as they are based on bird strike data from the USA and Britain.

40 Dr Anderson considers that the 13 km circle is based on guidance from the International Civil Aviation Organization (paragraph 31), and the 8 km circle from the Australian regulations (paragraph 32). These organisations may indeed recommend these circles, but Dr Anderson's evidence does not set out the data that justify such an approach.

41 The 3 km circle comes from United States bird strike data. Biologist Richard Dolbeer analysed 15 years of bird strike data from the United States Federal Aviation Administration's (FAA) wildlife strike database. He found that 74% of bird strikes occurred within 500 ft (152 m) of the

ground, and that aircraft descended to this height on approach approximately 10,000 ft (3,048 m) from the runway⁷.

- 42 FAA documents refer to the 10,000 ft/3 km measure as a 'separation distance' from the airport, and a second separation distance of five miles, equating to 8 km. However, I have not been able to find the justification for this second circle but assume that it also comes from the United States. The FAA does not use the 13 km circle.
- 43 Regarding the 13 km circle, the United Kingdom's Civil Aviation Authority 'Birdstrike risk management for aerodromes' states "The 13 km circle is based on a statistic that 99% of birdstrikes occur below a height of 2,000 ft, and that an aircraft on a normal approach would descend into this circle at approximately this distance from the runway."⁸ Though the measure is used in several countries, I have not been able to find the research on which it is based.
- 44 I note also that Dr Anderson states that the greatest risk for bird strike at Wellington Airport is during take-off and landing, which is supported by national data published by the CAA which shows almost all bird strikes occur "on airport". This raises the question of why land uses out to 13 km need regulation, when one of the key concerns is "land use activities that encourage bird movements across [aircraft] flight paths (evidence of Dr Anderson, paragraph 21).
- 45 In my opinion, these management circles are not relevant to New Zealand or Wellington as they are based on bird communities from other countries. An analysis of 30 years of US bird strike data (1990-2020) amounting to over 230,000 bird strikes shows that 608 species of

⁷ Dolbeer R.A. 2006: Height distribution of birds recorded by collisions with civil aircraft. *Journal of Wildlife Management* 70: 1345-1350

⁸ UK Civil Aviation Authority 2008: CAP 772 Birdstrike Risk Management for Aerodromes. First edition March 2007, Amendment 1 incorporated 1 September 2008.

birds were recorded⁹. In comparison, New Zealand has just over 200 breeding species of introduced and native bird species *in total*.

- 46 Raptors (e.g., eagles, falcons, and vultures), were the most reported group of species involved in bird strike in the US, involving 34 different species, whereas New Zealand has only two species of raptors (kahu | Australasian harrier, and karearea | New Zealand falcon), and neither are considered a problem at Wellington Airport. The US dataset contains strikes for 17 gull species; in contrast, New Zealand has only three species of gulls, and only black-backed gull is considered a problem at Wellington Airport.
- 47 A much more useful approach would be to consider the distribution, ecology, and population trajectories of the key risk species. Wellington Airport has an excellent understanding of these aspects of black-backed gull ecology.

KARORO | BLACK-BACKED GULL

- 48 The southern black-backed gull or karoro is a native species, common throughout much of the southern hemisphere at similar latitudes to New Zealand. It is classified as Not Threatened and is one of only two native bird species that have no protection under the Wildlife Act 1953.
- 49 Black-backed gulls are often referred to as 'super-abundant'. Their opportunistic feeding habits have seen the species benefit spectacularly from human habitation, in particular, the way we manage waste. Little is known of the size of the Wellington population when Europeans began to arrive in the early to mid-1800s, but it was likely only a few hundred birds. Numbers began to increase almost immediately. The first study of Wellington's black-backed gulls was

⁹ Dolbeer R.A., Begier M.J., Miller P.R., Weller J.R. and Anderson A.L. 2021: Wildlife Strikes to Civil Aircraft in the United States, 1990-2019 (No. DOT/FAA/TC-21/19). United States. Department of Transportation. Federal Aviation Administration. William J. Hughes Technical Center. 106pp.

undertaken in the 1960s, and reported 31 breeding colonies on the mainland, and 10 on islands, the largest being 2,000 pairs on Mana Island¹⁰. Two pairs were reported on the Miramar Peninsula. Solitary nests were present around the coast. The population south of Waikanae and Kapiti Island on the west coast and Cape Palliser on the southeast coast was estimated at between 12,000 and 17,000 birds. Aerial surveys in the 1960s indicated that half of the population was located at or near landfills or meat works.

- 50 Surveys of Wellington Harbour undertaken by the Ornithological Society of New Zealand (now Birds New Zealand) in 1975-77 and 1986-88 indicate that the increase continued into the 1970s (c.8,000 birds around the harbour)¹¹. However, significantly fewer birds were counted in the second set of surveys, thought to be because the gulls had been drawn away from the harbour by the new Silverstream landfill, where up to 20,000 birds had been recorded on single occasions. In contrast, numbers increased between Moa Point and Ōwhiro Bay, where untreated sewage was being released into the sea. At the same time, the Southern Landfill was also in operation, less than 3 km from Ōwhiro Bay. Today, flocks of more than 1,000 black-backed gulls are often present at the Southern Landfill¹².
- 51 The abundance of black-backed gulls is not only a problem at New Zealand airports. The species feeds on farmland, taking invertebrates, particularly from ploughed fields, but also scavenging lambs' tails, afterbirth, and occasionally targeting sick lambs and cast sheep. They are known to be an important vector for pathogens such as *Salmonella* due to their scavenging habits and extensive movements. The species

¹⁰ Fordham R.A. 1956: History and status of the Dominican gull in Wellington. *Notornis* 14: 144-153.

¹¹ Robertson H.A. 1992: Trends in the numbers and distribution of coastal birds in Wellington Harbour. *Notornis* 39: 263-289.

¹² Biz Bell, *pers. comm* in Miskelly C.M., Bell B.D. and Bishop D.M. 2023: Changes in a New Zealand wetland bird community following creation of a predator-fenced sanctuary. *Notornis* 70: 160-169.

can roost and nest on rooftops, damaging infrastructure and causing a nuisance.

- 52 From an ecological perspective, black-backed gulls also have significant impacts on other native bird species throughout New Zealand. During research for my PhD on the endemic tarāpuka | black-billed gull, I was witness to the complete collapse and abandonment of black-billed colonies on Southland's rivers from general harassment by the much larger black-backed gull, and the predation of eggs and chicks.
- 53 Wellington Airport has been at the forefront of managing black-backed gull numbers in the region. In 2000, a Masters was completed on black-backed gull movements at the airport¹³. The airport has also contracted ecologists to monitor the breeding population of black-backed gull around the airport and coastlines for many years.
- 54 The airport contracted Australian company Avisure, a global specialist in managing bird populations at airports, to write the Black-backed gull Interim Management Plan (2018). Many actions recommended in the plan have since been implemented, such as establishing a black-backed gull working group, which includes Wellington City Council and Greater Wellington Regional Council in the same year.
- 55 The airport has worked closely with the Department of Conservation to reduce the large black-backed gull population nesting on Matiu | Somes Island by funding extensive native planting to modify the breeding habitat of the species. Elsewhere, it has worked closely with the Department and local authorities to control black-backed gull numbers. The following page shows a screenshot of a webpage from the airport's

¹³ Shorter C. 2000: Black-backed gulls at Wellington Airport: daily, seasonal and weather trends in numbers and activity, and relationship to bird strike risk. Victoria University Master of Arts (unpublished).

website on “Wildlife Management” which summarises aspects of the airport’s management of black-backed gull.



WILDLIFE MANAGEMENT

Keeping birds away from the runway is important for the safety of planes and passengers.

The Civil Aviation Authority considers Wellington Airport to be low risk for wildlife incidents due to the low number that occur for the volume of traffic we experience.

Of biggest concern is the black-backed gull, which is a scavenger bird and the most widespread coastal bird in Wellington.



These birds are unwelcome and not just because of the risk they pose to planes. They also carry bacteria and are a threat to many of our native bird species.

Sometimes you may hear sirens, bangs, horns, and even fake bird calls coming from the airport. These are all auditory dispersal methods that Wellington Airport uses to disperse wildlife without causing harm.

What we are doing

Every year we invest considerable time and resources to manage and monitor the local gull populations. This includes:

- Using GPS tracking to monitor gull movements.
- Keeping grass short and using a special grass on the runway and taxiway areas to repel birds.
- Equipping airside vehicles and the roof of our main terminal with distress calling systems to deter birds.
- Monitoring and managing nests to ensure they do not increase to levels that create an unacceptable risk of bird strike.
- Working with landfill operators to reduce the amount of food available to opportunistic species such as seagulls from unnatural sources.
- Supporting revegetation programmes in the Miramar Peninsula and Greater Wellington region to alter the habitat available to gulls.
- Work with the Black-Backed Gull Working Group which includes airlines, councils, land owners, conservation groups and Victoria University.

What you can do to help

- Please don't feed black-back gulls or leave food lying around.
- Conceal food waste by tightly covering.

- 56 Wellington Airport undertook research of black-backed gull movements between major landfills in the greater Wellington region in collaboration with local councils. Hundreds of black-backed gulls were colour-marked *en masse* at Silverstream (Hutt Valley), Spicer (Porirua), and Southern landfills. GPS tags were also attached to five individual birds. As expected, most gulls observed at the airport were also foraging at the closest Southern Landfill. However, GPS data indicated that individual gulls foraged at all three landfills. Dr Anderson provides further detail on the GPS results, noting that the five gulls travelled as far as Paraparaumu to the north, and Seddon in the South Island (his paragraph 56).
- 57 Mr Howarth considers management of black-backed gull a priority (paragraph 4.13). He is concerned that the airport needs to rely on non-regulatory means to manage hazardous land uses “off-airport”. However, it seems likely that most land uses that attract black-backed gulls within Wellington City will remain largely the same and that the best management tool available to the airport will be to continue working with the Department of Conservation, local authorities and landowners to reduce the risk to the airport.
- 58 When I presented evidence at the Christchurch and Waimakariri District Plan hearings in 2016 and 2024 respectively, the same 3 km, 8 km, and 13 km circles were proposed by Christchurch International Airport Limited. In both cases I recommended that the regulation of landfills should cover everywhere in the districts, not just out to 13 km. This is because landfills have the potential to provide the greatest supply of anthropogenic-sourced food for black-backed gulls within the landscape, and gulls are capable of movements much further than 13 km management circle to forage. The extensive movements of black-backed gulls are supported by Wellington Airport’s research. My recommendation was adopted in the Christchurch District Plan (see Appendix, Ms O’Sullivan’s evidence). The Waimakariri District Plan is not yet finalised.

- 59 In my opinion, bird strike management plans should be required for all waste management facilities, including human sewage facilities, in the Wellington District. This can exclude cleanfills. These facilities do not just attract black-backed gulls, causing movements across the landscape, but can act as major food sources leading to increased populations.
- 60 In comparison, the other land uses highlighted by Wellington Airport such as fish processing and freezing works pose less risk as they provide a lesser food source for black-backed gulls. Furthermore, these types of land uses produce food for human consumption, and it is in the best interest of landowners/companies to avoid attracting black-backed gulls which are known vectors of human pathogens.
- 61 For the Christchurch District Plan, I recommended that these land uses were regulated, but only within the 3 km management circle (see appendix attached to Ms O’Sullivan’s evidence). This addresses the potential for increasing the risk of movements of black-backed gulls near and over the airport which is where almost all incidents occur (evidence of Dr Anderson, paragraph 21).
- 62 Ms O’Sullivan has requested regulations out to 8 km, but there is no ecological justification provided for this departure from the Christchurch rules.
- 63 I can support in principle the use of the 3 km management circle in the Wellington District Plan for freezing works and fish processing. However, I note that environs within the 3 km management circle vary significantly between Wellington and Christchurch airports. Land uses around Christchurch Airport have undergone immense changes over the last few decades and development is continuing. In contrast, Wellington Airport sits within an urban area which seems to be relatively stable, and which may not have such a need for regulating land uses like freezing works.

WATERFOWL: MALLARD AND CANADA GOOSE

- 64 Wellington Airport considers that the introduced mallard and geese species have a 'High' risk profile, though there has only been one mallard strike and two near strikes and only one near strike with a goose (species unknown) in 11 years. This is due to the large size of the species, as an impact has the potential to cause significant damage.
- 65 However, in contrast, there have been 134 strikes and 429 near strikes with black-backed gulls in the same timeframe.
- 66 These vastly different strike rates clearly show that focusing on the management of black-backed gull populations will have the greatest influence on overall strike rates and damaging strikes at the airport.
- 67 Dr Anderson mentions two high risk sites within Wellington that provide ponds or lakes for waterfowl: the Miramar Golf Course, and the Wellington Botanic Gardens. He also lists Zealandia, although not in reference to the water reservoirs which are the largest freshwater ponds or lakes in the vicinity of Wellington City.
- 68 The populations of mallards are well documented at Zealandia. The upper lake is 1.1 ha, and the lower lake is 2.7 ha. Counts of wetland birds on the upper and lower lakes have been undertaken quarterly during 1995-1998 (before the predator-proof fence was constructed), 2002-2005, 2013-2016, and 2020-2023. The eradication of predators has had no significant effect on mallard numbers within the lakes, and numbers remained unchanged at an average count of approximately 49 birds per count until 2016, after which they declined significantly to an average of 11, for reasons that are not understood¹⁴.

¹⁴ Miskelly C.M., Bell B.D. and Bishop D.M. 2023: Changes in a New Zealand wetland bird community following creation of a predator-fenced sanctuary. *Notornis* 70: 160-169.

Little else is known of the Wellington mallard population, though it may be that the local city population is relatively small if the largest wetlands available support an average of only 49 birds. Interestingly, eBird data suggest that many mallard sightings around Wellington city are associated with the coastline and not with ponds and other standing water (Figure 1).

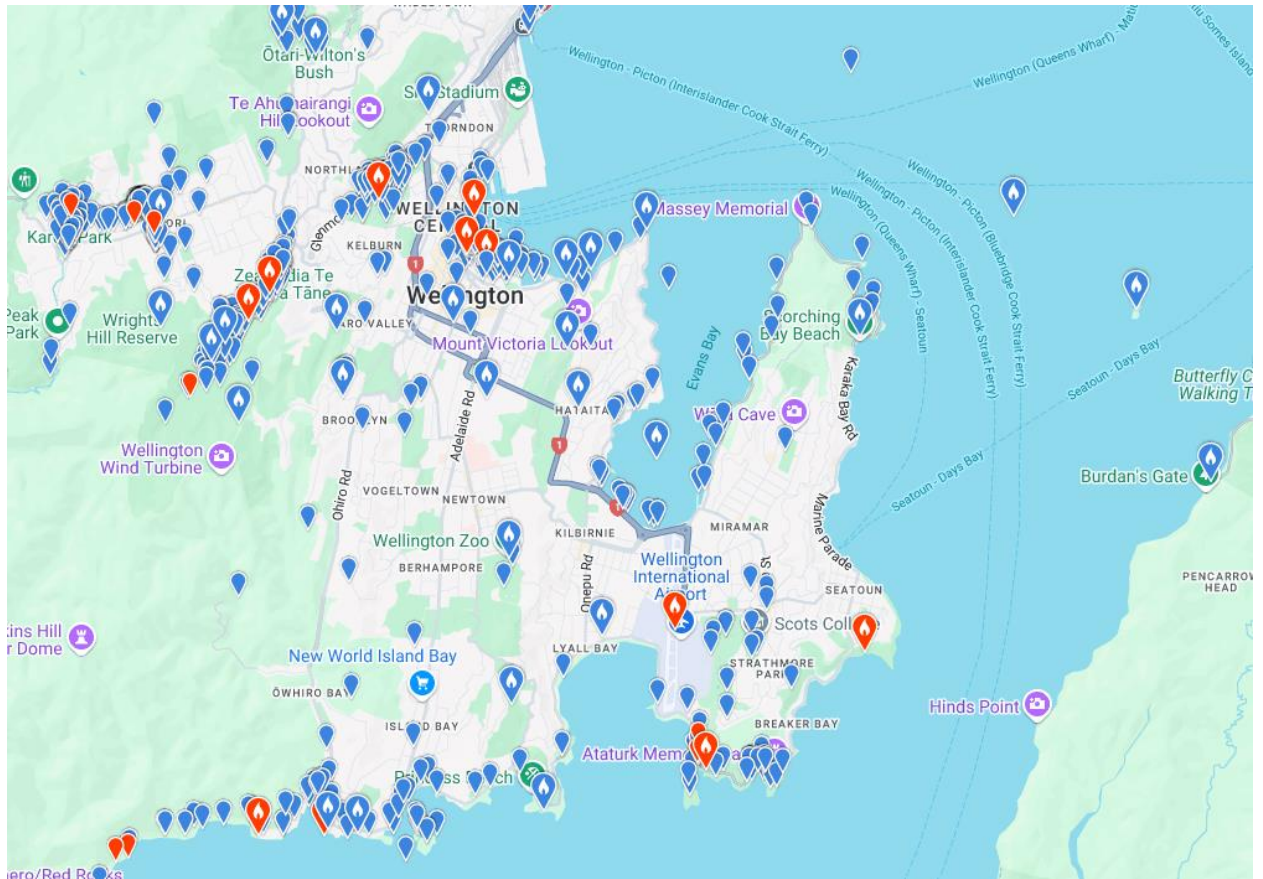


Figure 1: eBird records for mallard in the vicinity of Wellington City. Red markers are the most recent records. Marker location does not necessarily denote where the records were made, as some records are of bird sightings that were made while walking considerable distances. eBird is the global citizen science online database of bird sightings.

As Dr Anderson indicates, Canada geese are rarely seen in the vicinity of Wellington Bay City. Porirua City supports a population of less than 200 birds, which are almost entirely associated with the city's harbour and associated green spaces. The geese are believed to cause considerable damage to the rare saltmarsh habitat of the harbour and compete with other shorebirds and waders for roosting and nesting space. I understand there have been recent culls. Little suitable habitat – such

as large waterbodies with adjacent grassed areas where human disturbance is low – exists for the geese in Wellington City.

71 I recommended regulating waterbodies in Christchurch out to 3 km. However, freshwater lake and pond habitat is abundant around Christchurch airport, and Canada goose and other waterfowl populations are considerably higher, as are strike rates.

72 In my opinion, the need for regulation of waterbodies around Wellington Airport seems unnecessary for several reasons:

- The existing scarcity of ponds and lakes in Wellington City
- The use of coastal habitat by mallards (in Wellington) and Canada geese (in Porirua) making regulation of freshwater habitats less useful
- The lack of suitable habitat (wetlands in association with grassland) for Canada geese in Wellington City
- The likelihood that the mallard population is relatively stable
- The very low risk of bird strike.

SPUR-WINGED PLOVER

73 Spur-winged plover is a native species that self-introduced from Australia in about the 1930s. It is the only other unprotected native bird species in New Zealand.

74 Dr Anderson discusses spur-winged plover as the airport classifies them in the same risk category as feral pigeon, mallard and Canada goose. They are the cause of many strikes and near strikes at the airport. It is

not clear however, what, if anything, the airport is requesting regarding managing strike risk from spur-winged plover in the district plan.

- 75 The species associates with extensive grasslands like parks and farms, and other than Mr Howarth's mention of farming as a bird strike activity, there is nothing in the definition of bird strike activity given in the memorandum that applies to spur-winged plover.
- 76 My understanding from my involvement in the Christchurch and Waimakariri District Plan hearings, where spur-winged plover was not discussed at the hearing despite being a major cause of bird strike (at similar levels to black-backed gull), is because the airport considers the species is best managed "on airport", and it is not addressed in Chapter 7 "off-airport wildlife management" in the airport's Wildlife Hazard Management Plan.
- 77 Mr Phillip Shaw, Director of Avisure, a global specialist in wildlife management at airports, stated in evidence presented for the airport at the Selwyn District Plan hearing (8 September 2021):
- 77.1 "Other species listed in the risk matrix are better managed in other ways. For instance, the Harrier operates over large territories so culling would only open a niche for new hawks to enter. Management of this species is best handled on-airport. In addition, the spur-winged plover is highly territorial, particularly during breeding season, and is best managed at the airport itself with habitat modification. Reducing food for ducks in public spaces such as the Groynes, Styx Mill and Roto Kohatu is the primary control measure for those species."
- 78 On this basis, in my opinion, spur-winged plover does not need to be addressed at this hearing.

FERAL PIGEON

- 79 The introduced feral pigeon (or rock pigeon) is poorly studied in New Zealand. International research shows that individuals can fly several kilometres to foraging opportunities, but there are few data to describe movements in this country. Dr Anderson notes that they are abundant in Wellington and particularly the central business district but provides little further information on Wellington populations.
- 80 Masters research has been undertaken on central Wellington pigeons. Birds were banded at several central city locations and then searched for at multiple sites around Wellington city¹⁵. Though lacking the accuracy of GPS tracking technology, the research indicated birds often travelled very short distances from their roosts to forage – often only a few hundred metres – indicating abundant local food sources in the city.
- 81 Controlling pigeon numbers, particularly in city environs, can be difficult as culling is a controversial topic amongst the public. Likewise, limiting food supply in a city is difficult due to rubbish and people purposefully feeding them.
- 82 I have recommended regulation of landfills throughout the Wellington District, which will also have the effect of reducing the attractiveness of these facilities to feral pigeons.

CONCLUSION

- 83 The risk of strike events involving black-backed gulls at Wellington Airport is extremely high. The species is the highest priority for management at the airport and this is the appropriate focus.

¹⁵ Ryan A.C. 2011: The distribution, density and movements of feral pigeons *Columba livia* and their relationship with people. Master of Science in Ecology and Biodiversity, Victoria University, Wellington.

- 84 Waste management facilities like Southern Landfill, Spicer Landfill, and Silverstream Landfill provide the largest human-sourced food supply for black-backed gulls in the wider Wellington region. Extensions to these landfills, or the establishment of new waste facilities including composting facilities (but excluding cleanfill), should be subject to a bird strike management plan anywhere in the Wellington District given the long distances over which black-backed gulls are known to forage.
- 85 Freezing works and fish processing facilities are lesser potential food sources and could be regulated within 3 km of Wellington Airport's runways to reduce the risk of bird movements across the airport where almost all strikes are known to occur if the potential for such land uses in this urban area exists.
- 86 Waterbodies do not need to be regulated, as the mallard population in Wellington is likely stable and relatively small and appears to be strongly associated with coastal habitats. The strike rate for mallard is very low. Canada geese are largely absent from Wellington City.

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