

Before the Hearings Panel At Wellington City Council

UNDER Schedule 1 of the Resource Management Act 1991
("RMA" or "the Act")

IN THE MATTER of the proposed Wellington City District Plan

**Statement of evidence of Dr Michael Anderson on behalf of Wellington
International Airport Limited (Ecology).**

Date: 23 October 2024

INTRODUCTION

- 1) My full name is Michael Gareth Anderson. I hold the position of Senior Ecologist at Bioresearches, a specialist ecology brand of Babbage Consultants Limited (“Babbage”). I have held this position since January 2023.
- 2) In my role as a Senior Ecologist, I undertake, supervise and review Ecological Impact Assessments (“EclAs”), and provide technical ecological advice to a range of clients regarding biodiversity valuation, project design and opportunities to avoid, mitigate, offset, compensate and restore environments. I specialise in terrestrial ecology, including indigenous fauna and flora, particularly regarding native birds.

QUALIFICATIONS AND EXPERIENCE

- 3) I am qualified with the degree of Doctor of Philosophy (Ph.D., Ecology) from Massey University, a Masters of Science (First class honours, Ecology) and Bachelors of Science (Biology) from the University of Auckland.
- 4) I have over 20 years’ experience studying terrestrial species and ecosystems in New Zealand.
- 5) My professional memberships include the
 - a) Environmental Institute of Australia and New Zealand and
 - b) The Ornithological Society for New Zealand/Birds New Zealand.
- 6) My previous employment and associated positions include:
 - a) Massey University:
 - i)* Senior Tutor in Ecology and Zoology (2019-2022);
 - ii)* Postdoctoral Fellow in Ecology (2016-2019);
 - iii)* Lecturer (2016);
 - iv)* Foundation of Research Science and Technology Postdoctoral Fellowship (2011-2015); and
 - v)* Research Officer, Ecology Group and New Zealand Institute for Advanced Studies (2009-2010).
 - b) University of Western Ontario, Canada: Government of Canada Postdoctoral Research Fellowship (2010-2011).
 - c) Auckland Regional Council: Research Consultant (2004).

- 7) I attended the Aviation Wildlife Safety Conference, hosted by Auckland International Airport Limited in August 2024. The conference covered wildlife risk issues to air traffic, including bird strike.

EXPERT WITNESS CODE OF CONDUCT

- 8) I have read the Code of Conduct for Expert Witnesses, contained in the Environment Court Consolidated Practice Note (2023), and I agree to comply with it. I can confirm that the issues addressed in this statement are within my area of expertise and that, in preparing my evidence, I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

PURPOSE AND SCOPE OF EVIDENCE

- 9) I was engaged by Wellington International Airport Limited (“**WIAL**”) in September 2024 to provide advice and evidence regarding the Wellington City Council (“**WCC**”) Proposed District Plan (“**PDP**”). Specifically, I was asked to assist with the provision of ornithological information relating to Wellington International Airport and to consider which land activities are most likely to act as a bird attractant given the species composition and populations present.

- 10) In brief, WIAL has sought relief for a bespoke framework to be established to manage land use activities within a fixed distance of the Airport that are considered to increase the risk of bird strike.

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, and
- g) abattoirs and freezing works.

- 11) The relief sought was subsequently refined through a Mitchell Daysh Limited Memorandum dated 17th September 2024¹. Mitchell Daysh

¹ [https://wellington.govt.nz/-/media/your-council/plans-policies-and-bylaws/district-plan/proposed-district-plan/files/hearing-streams/rapup/submitter-materials/wial-memo-section-32aa-proposed-bird-strike-provisions-\(1\).pdf](https://wellington.govt.nz/-/media/your-council/plans-policies-and-bylaws/district-plan/proposed-district-plan/files/hearing-streams/rapup/submitter-materials/wial-memo-section-32aa-proposed-bird-strike-provisions-(1).pdf)

Limited, WIAL and I collectively prepared the revised rules, drawing from our respective areas of expertise to inform which land use activities pose the greatest risk to WIAL based on the bird species present, the surrounding environment and historic development proposals that WIAL has been involved in. These rules have been further refined by Ms O’Sullivan in her evidence.

- 12) The section 42A report has recommended additional evidence be provided to the Panel, including an assessment of recorded incidents or near misses.
- 13) I have been asked to comment on the relief sought by WIAL in relation to the PDP. My evidence will address:
 - a) A summary of information regarding the breeding, roosting and feeding habits, as well as known movement patterns of the high strike risk bird species in the Wellington ecological district;
 - b) The use of shared airspace by those species and aircraft at WIAL; and
 - c) Land uses that are attractive to those birds.
- 14) In preparing my evidence, I have reviewed and considered the following:
 - a) The relevant parts of the Section 42A Report for the Wrap Up Hearing Stream dated 9 October 2024.
 - b) The evidence of Mr Jack Howarth and the evidence of Ms Kirsty O’Sullivan.

EVIDENCE SUMMARY

- 15) My evidence addresses the abundance and distribution of local bird populations in Wellington that pose a potential risk for bird strike for WIAL. This is based on baseline surveys undertaken by WIAL for key species, published literature and online databases (eBird, iNaturalist, GBIF.org).
- 16) Available information about bird abundance and bird strike records is used to inform the bird strike risk management by WIAL and in turn inform the relief that WIAL is seeking in the PDP.

- 17) WIAL's proposed provisions adopt a 0-8 and 8-13 km buffer from the Airport to define an area within which different bird strike management rules would apply. My evidence focuses on locations within the entire 13 km zone for which land use activities could contribute to the risk of bird strike.
- 18) The bird species that pose the greatest risk are generally the large and/or flocking species, which have the potential to increase in abundance with the specified activities.
- 19) The current identified high risk species include the southern black-backed gull ('**SBBG**'), goose species (Canada and Greylag Goose), mallard, rock pigeon and spur-winged plover.
- 20) The SBBG is considered an 'extreme risk' because it is a large bird and travels large distances to forage opportunistically (e.g. scavenge), whereas the others are considered 'high risk'.
- 21) WIAL bird strike records indicate that the greatest risk for bird strike is during aircraft take off and landing, with almost all incidents occurring at these times. Land use activities that encourage bird movements across these flight paths during these times have the potential to increase bird strike risk.
- 22) In addition such activities have the potential to attract additional bird species, that aren't currently considered high risk. This would increase the risk level for these species. Such species include other gull species, starlings, swans and up to 3 species of shag. Land use activities that increase population abundance, either by providing new food resources or suitable breeding locations or encourages movements across the landscape add to bird strike risk.
- 23) GPS tracking of SBBG indicate daily movements from coastal areas that are used for roosting and nesting to inland areas for foraging, such as the Southern Landfill. Although this study was on a small number of birds (5) it gave clear indications that this species has large home ranges and are capable of moving large distances, with one bird visiting the South Island. Adult birds breeding on Matiu/Somes Island frequently flew to the Southern Landfill to forage, whereas non-breeding juveniles most frequently flew from the landfill to areas on the southern coast and Miramar Peninsula.

- 24) SBBG breed throughout the Wellington coastline, with several larger colonies and individual nests interspersed between. Regular monitoring by WIAL shows that unmanaged colonies increase in size and regular culling is necessary to manage population size. Bird strike incidents by SBBG peaked in 2017 with 56 events and again 2023 with 62.
- 25) Land use activities that provide new food sources or new breeding locations have the potential to increase population abundance and hazardous movements across the landscape by SBBG. Any land use activity that provides a significant food source, such as a landfill, fish processing or abattoir/freezing works within 13 km of the airport, has the potential to attract large numbers of SBBG, which would also create new daily movements by birds that could intercept plane flight paths.
- 26) Other specified land use activities, such as sewage treatment and disposal or artificial and natural lakes/waterbodies have the potential to attract birds associated with water, such as mallards and geese. Activities producing food waste attract several species such as SBBG and rock pigeons.
- 27) As such to the extent of my expertise I can support the inclusion in the PDP the WIAL proposed bird strike rules regarding particular land uses near airports.

BIRD STRIKE

- 28) I understand that bird strike is a key issue for the safe operation of Wellington Airport. To reduce bird strike, the monitoring and management of wildlife on the airport property and in the surrounding areas is conducted in accordance with the WIAL Wildlife Hazard Management Plan (“**WHMP**”).
- 29) WIAL has sought amendments to the PDP to allow for a bespoke framework to provide a consistent and effective approach for off-airport land use activities that could comprise a bird attractant to reduce the incident of bird strikes. The framework recommends for a specific and limited list of land-use activities to be to be considered

either Restricted Discretionary, or Discretionary, based on activity type and distance from the airport (8 or 13 km).

30) The proposed framework provided by WIAL is summarised as the following:

a) Activity status: **Restricted Discretionary**. Where:

- i) Any Bird Strike Risk Activity is proposed within an 8km radius of the thresholds of the runways at Wellington International Airport (as shown on the planning maps); or

The matters of discretion are:

- ii) The extent to which the proposed activity will be designed, operated and managed to avoid attracting bird species which constitute a hazard to aircraft.
- iii) Whether a bird management plan has been prepared by a suitably qualified ornithologist that describes how the activities will be managed on site to minimise potential bird strike risk at Wellington International Airport, and whether consultation has been undertaken with the Airport Authority and feedback integrated into bird management plan;
- iv) The matter set out in INF-P7.

b) Activity status: **Discretionary**. Where:

- i) The Bird Strike Risk Activity is a landfill proposed within a 13km radius of the thresholds of the runways at Wellington International Airport, as shown on the planning maps.

31) I understand that the outer radius area of 13km is based on the airport services manual (Pt. 3, Section 7.2.2, International Civil Aviation Organization, “**ICAO**”) that states that *“it is desirable that sites be no closer than a 13 km circle centred on the ARP (aerodrome reference point) and, in some cases, further — where studies of flightlines of birds attracted to these sites prove them problematic for the airport. If a refuse site in the vicinity of an airport cannot be closed, it likely will be necessary to try to influence the operators to provide control measures at the site to reduce its attractiveness to wildlife”*

32) I further understand that the proposed inner radius area of 8 km is based the Australian aviation regulator’s (CASA) Wildlife Hazard

Management document, page 5². Specifically, the definition of an aerodrome vicinity states that *for the purposes of wildlife hazards, may be considered as being:*

- a) *for sources of attractants and wildlife movements which present a hazard — within a radius of 3 km from all the runways of an aerodrome; and*
- b) *for significant sources of attractants or hazardous wildlife movements across the aerodrome site — within a radius of 8 km from the aerodrome reference point*

33) The proposed framework provided by WIAL is aimed at the management of targeted land uses that may provide new and additional habitat that could become attractive to birds, which could subsequently increase the local population number of extreme and high-risk species and/or increasing their movements across plane flight paths especially if not managed appropriately.

34) High risk off-airport bird hazard sites within Wellington (see Appendix 1 for locations) have previously been identified by the WHMP. These vary in distance from Wellington Airport from immediately adjacent (Bridge Street garden and Lyall Bay) up to 12 km (Hutt River). A full list of these hazard sites is provided below, including a brief description of the bird species present and how they use these sites.

- a) Southern Landfill: This is one of the most significant off-airport sites for wildlife risk. It provides a significant food source for Southern Black-Backed Gulls / Karoro, which encourages movement of birds to and from the Landfill, including crossing the airport;
- b) Hue te Taka/ Moa Point: This tidal islet off the southern coast of the Miramar Peninsula has historically been a major breeding colony for SBBG for several decades;
- c) Miramar Peninsula: The Miramar Peninsula provides a range of environments that attracts a varied number of bird species that

1) ² <https://www.casa.gov.au/sites/default/files/2023-06/advisory-circular-139.c-16-wildlife-hazard-management.pdf>

WIAL considers a risk to aircraft movements, particularly SBBG, variable oystercatchers, and red-billed gulls;

- d) Local Parks: The sports fields and open spaces provide roosting sites for large numbers of SBBG and red-billed gulls / Tarāpunga (“**RBG**”). Key sports fields such as Kilbirnie Park, Crawford Green, and Seatoun Park;
- e) Local Schools: Like parks, schools provide large, open grounds for gull species to shelter and roost on, but with increased access to food;
- f) Lyall Bay: Lyall Bay is a natural habitat for a variety of bird species. SBBG, RBG and variable oystercatchers are the 3 key species that are utilise this bay for roosting and feeding;
- g) Matiu/Somes Island: The island attracts large numbers of roosting and breeding SBBG throughout the year. Their population is actively managed, to reduce impacts on other local biodiversity and reduce the risk of bird strike for Wellington Airport;
- h) Miramar Golf Course: Miramar Golf Course is the largest highly maintained body of grass and vegetation that is near Wellington Airport. Species such as blackbirds, thrushes, sparrows, and starlings commonly visit the grounds due to the shelter and food opportunities present. Spur-winged plovers, and both mallards and paradise shelducks have been seen utilising the course’s ponds. SBBG also visit but predominantly in adverse weather conditions;
- i) Wellington Harbour: A variety of small to medium large birds inhabit Wellington’s harbour, chiefly feral pigeons, RBG, SBBG, and white-fronted terns. Wellington harbour is one of the few locations near WIAL that hosts a significant sized regular grouping of white-fronted terns. This species doesn’t pose a significant historical threat to aircraft at the Airport, however have been struck by aircraft on rare occasions;
- j) Bridge Street Community Garden: The garden is adjacent to the airport used for composting airport food waste. The site is monitored closely has and therefore has not been found to be a significant attractant to birds.;

- k) Zealandia: Zealandia is a conservation project that is a refuge to a variety of species. This has increased the population of some species in the Wellington City area, such as tūī and kākā;
 - l) The Hutt River: The mouth of the Hutt River is noted for its attraction to Canada geese and black swans, species that rank highly on WIAL's species risk matrix. These two species are not often seen near the airport, yet, if struck, can cause significantly more damage to aircraft than other species due to their large mass. SBBG are also known to commonly frequent this location.;
 - m) Wellington Botanic Garden: Ducks and other birds frequent the Wellington Botanic Gardens due to the presence of bodies of water, and food availability. If startled from this location, mallards, which are of high body mass may fly east towards Wellington Airport. This is considered an unlikely, yet potentially hazardous scenario.
- 35) Of the above mentioned sites, only the Hutt River is located outside the WCC boundaries (i.e. it is in the Hutt City Council boundaries).
- 36) Mr Howarth provides details around how some high risk off airport bird hazard sites are currently managed.
- 37) WIAL has adopted the *Allan Risk Assessment method*³ to identify wildlife species risk severity. This method uses historical strike data to assign a risk level to specific bird species. Bird species are categorised in terms of their likelihood of being struck (using a five-year strike history from Wellington Airport), and the probability (consequence) of damage should they be struck (derived from the United Kingdom's bird strike database using body mass).
- 38) Based on the Allan Risk Assessment method (see Figure 1), the highest risk species are SBBG (Extreme), Goose species (High), Spur-winged Plover (High), Feral pigeon (High) and Mallard duck (High) (Figure 2).

³ Allan, J.O. 2006. A Heuristic Risk Assessment Technique for Birdstrike Management at Airports. *Risk Analysis* 26(3): 723 – 729.

Consequence of strike	Probability/ Likelihood of an incident per year				
	Almost certain	Likely	Possible	Unlikely	Very unlikely
Extreme >2000 g				Goose spp.	Gannet., Swan spp.
Very high 1000 – 2000 g	SBBG.			Mallard.	Paradise shelduck, Shag spp.
High 500g – 999g				VOC, Caspian tern, Australasian harrier.	SIPO, Kererū.
Moderate 200 -499 g	Spur-winged plover.	Feral pigeon.		RBG, Magpie.	Kākā, Bar-tailed godwit.
Low 100-199 g	Starling.		White-fronted tern.	Fairy prion.	Pied stilt, Great knot.
Very low <100g	Sparrow.	Chaffinch, Greenfinch, Goldfinch.	Black-fronted tern, Double-banded dotterel.	Thrush, Yellow hammer	Blackbird, Welcome swallow, NZ fantail, Tūi.

Figure 1. The matrix used to assign levels of risk to each bird species. The colours reflect risk levels from Extreme (upper left) to Very Low (bottom right). Figure sourced from the WIAL WHMP.



Figure 2. Examples of the five highest risk bird species identified by the Allan Risk Assessment method. Clockwise from top left: SBBG⁴ at a landfill, Canada Geese⁵ on pasture, Mallards⁶ flocking on a lake while being fed, rock pigeon's⁷ being fed in a Wellington park, spur-winged plover⁸ flocking. All photos from New Zealand.

⁴ <https://www.nzgeo.com/stories/black-backed-gulls/>

⁵ <https://www.nzbirdsonline.org.nz/species/canada-geese>

⁶ <https://www.nzbirdsonline.org.nz/species/mallard>

⁷ <https://www.nzbirdsonline.org.nz/species/rock-pigeon>

⁸ <https://www.nzbirdsonline.org.nz/species/spur-winged-plover>

BIRD STRIKE INCIDENTS AT WELLINGTON AIRPORT

- 39) Between 2013 and September 2024, there were 1251 wildlife incidents, of which 322 were bird strikes and 929 were near strikes.
- 40) The total number of bird strikes varies from 19 to 46 per year and the number of near misses varied from 26 to 115 per year (see Figure 4). Although the number of bird strikes has remained relatively stable since 2020 (19-28), the number of near misses has increased, peaking in 2022 (115).
- 41) The most recorded species in bird strike incidents was the SBBG with 563 incidents (Figure 3), considerably more than the species with the second greatest number of incidents, the starling (112).
- 42) Bird strike incidents are highest in the morning between the hours of 6-9am (Figure 5). Although there are some seasonal fluctuations in bird strike incidents by month, they occur all year round (Figure 6).
- 43) The flight phase during bird strikes is fairly evenly split between takeoff (598/1251; 47.8%) and landing (572/1251; 45.7%). Incidents during other flight phases (i.e. taxiing, 2/1251 or 0.16%; unknown 79/1251 or 6.3%) were much less common (Figure 7).

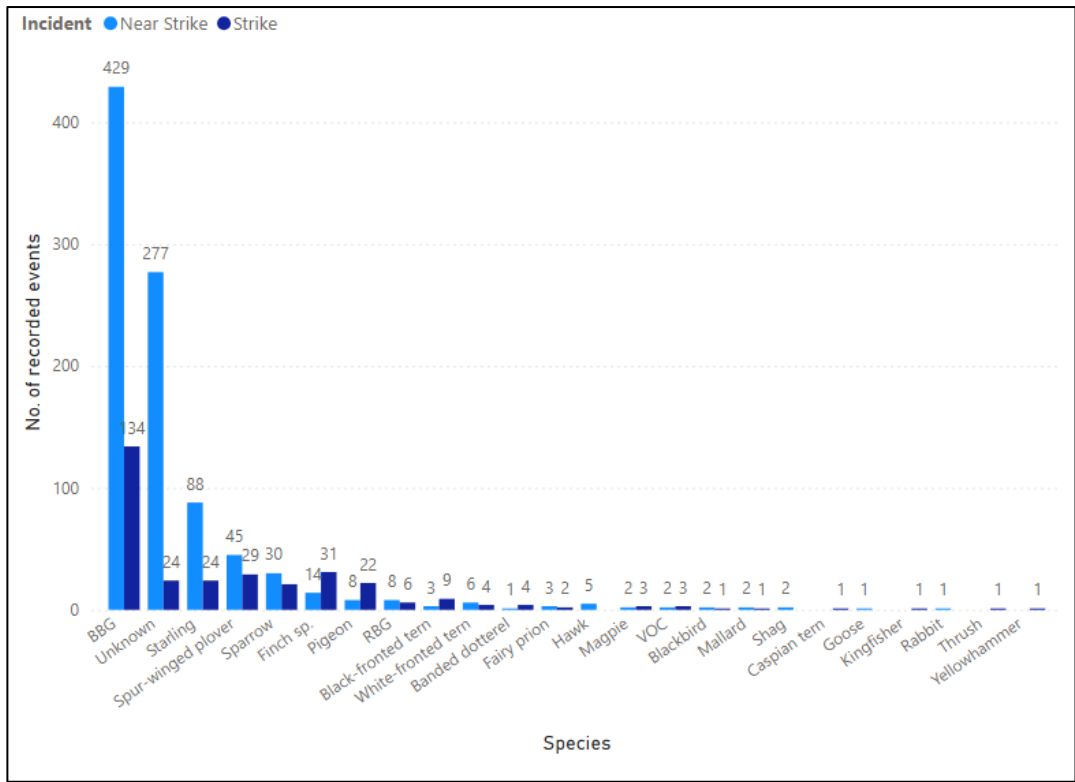


Figure 3. Number of recorded bird strike incidents at WIAL for each species recorded. Note that BBG = Southern Black-Backed Gull, RBG is Red-Billed Gull and VOC is Variable Oystercatcher.

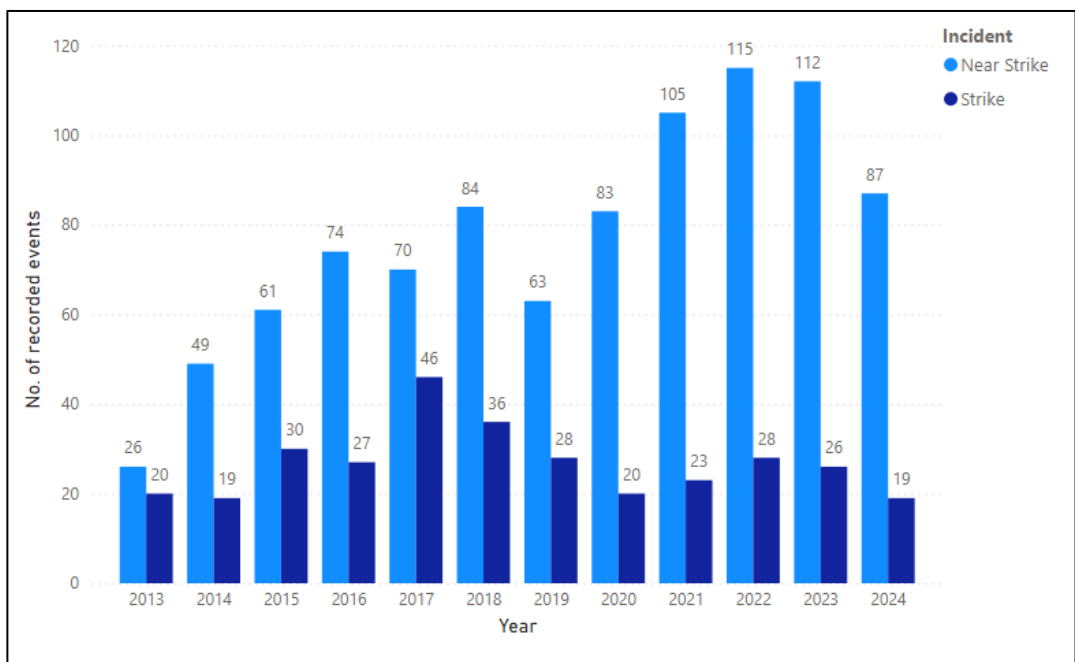


Figure 4. Bird strike records at WIAL from 2013-2024 (last updated September 2024). Data is separated into records of near strikes and strikes.

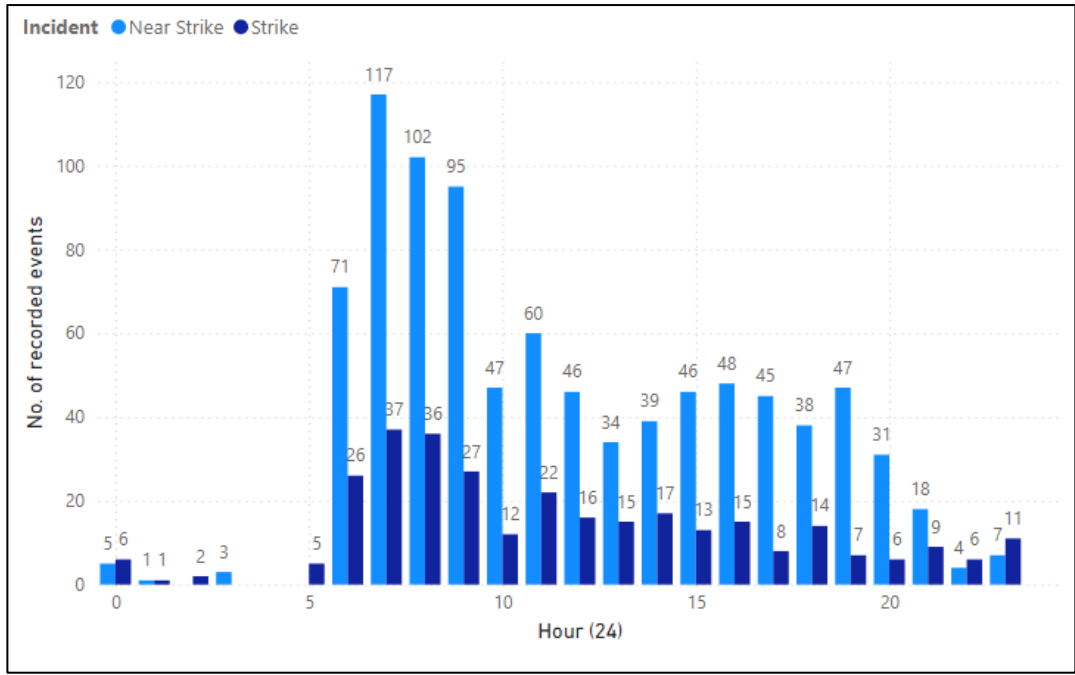


Figure 5. Bird Strike incidents by time of day from 2013-2024. Data is separated into records of near strikes and strikes.

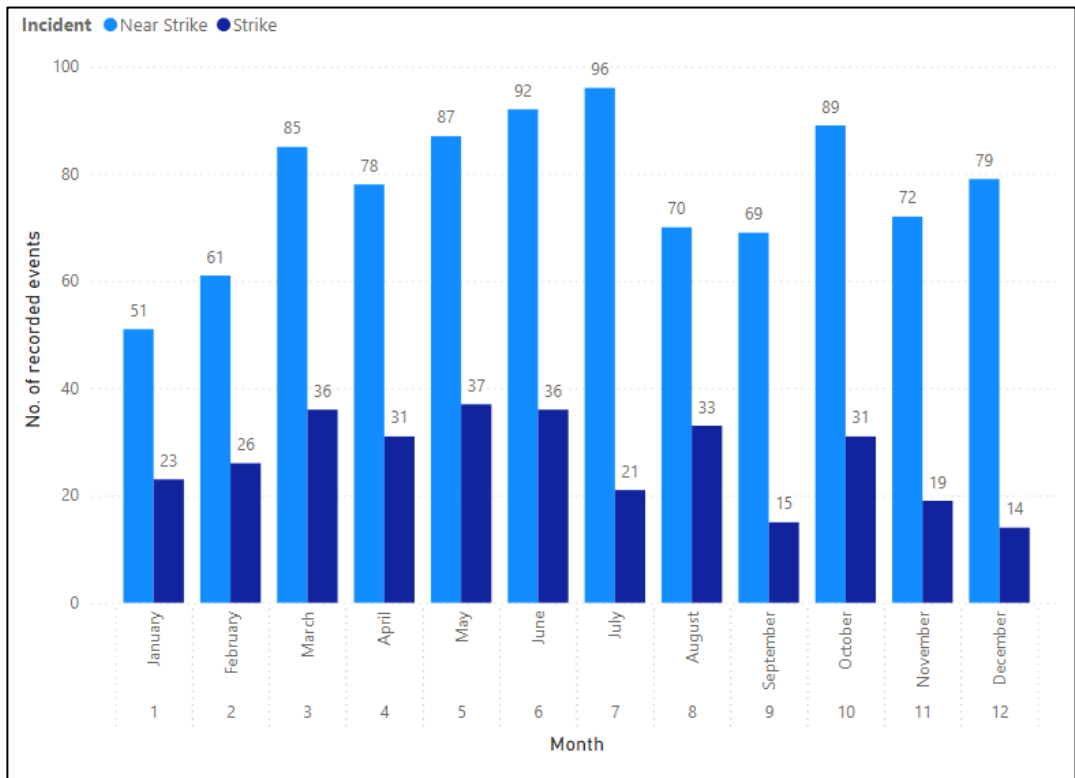


Figure 6. Bird strike incidents at WIAL by month of the year.

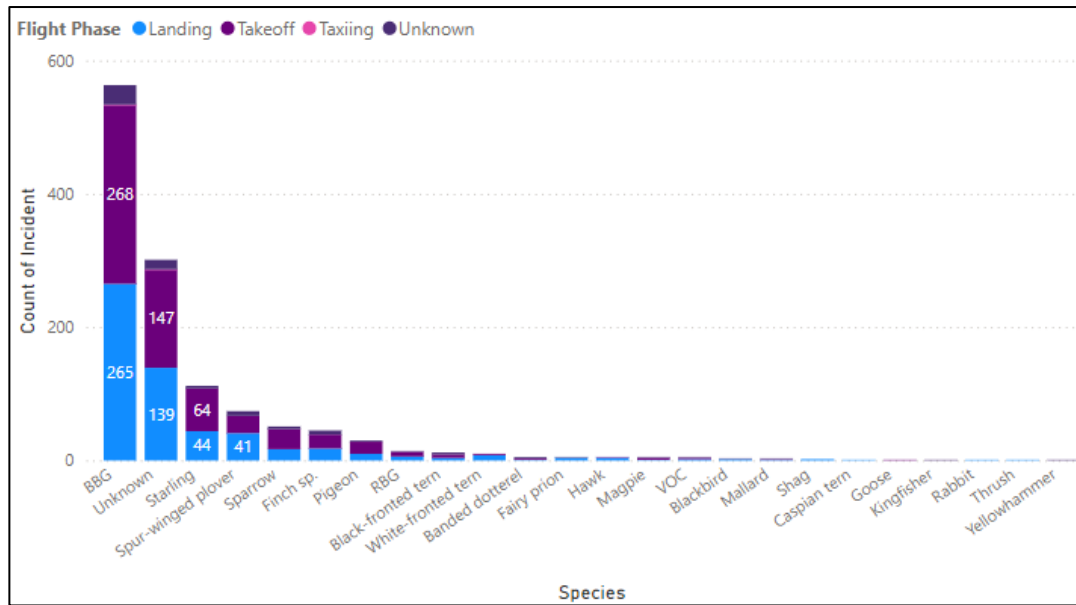


Figure 7. Frequency of bird strike incidents during different flight phases (takeoff, landing, taxiing, or unknown), for bird species at Wellington Airport.

BIRD POPULATIONS IN WELLINGTON

44) WIAL undertakes regular monitoring of the SBBG populations around the Wellington region by Wildlife Management International⁹¹⁰. These monitoring surveys have been carried out to monitor the abundance, distribution and breeding activity of SBBG at key sites in Wellington City, and the wider Wellington region.

45) Additional surveys of coastal birds in the vicinity of the airport have also been undertaken by the National Institute of Water and Atmospheric Research Ltd (NIWA) during 2020-2021¹¹.

46) I have also reviewed additional reports of avian surveys within the Wellington City District¹²¹³.

⁹ Bell, E.A. & Lamb, S.D. 2021. Population trends and breeding activity of southern black-backed gulls/karoro (*Larus dominicanus*) in the Wellington region: 2020/2021 Season. Client report prepared for Wellington International Airport Ltd. Wildlife Management International Ltd, Blenheim.

¹⁰ Bell, E. 2020. Population trends and breeding activity of southern black-backed gulls/karoro (*Larus dominicanus*) in the Wellington region: 2019/2020 Season. Client report prepared for Wellington International Airport Ltd. Wildlife Management International Ltd, Blenheim.

¹¹ Thompson, D. 2021. Wellington International Airport Coastal Bird Survey. Report prepared for Wellington International Airport Ltd. NIWA Taihoro Nukurangi, Wellington.

¹² Burgin, D., and Ray, S (2020) 2019 Operational report on Petone Beach to Oteronga Bay, Wellington coastal bird survey. Client report prepared for Greater Wellington Regional Council, Wildlife Management International Ltd, Blenheim.

¹³ McArthur, N.; Ray, S.; Crowe, P. and Bell, M. 2019. A baseline survey of the indigenous bird values of the Wellington region coastline. Client report prepared for Greater Wellington Regional Council, Wildlife Management International Ltd, Blenheim.

Southern Black-Backed Gull (SBBG) - Koraro

- 47) The SBBG (*Larus dominicanus*) is classified as *Not Threatened* on both a national and regional basis. The SBBG has a wide distribution with 5 sub-species distributed across the Southern Hemisphere.
- 48) The SBBG is one of only two native bird species that are not protected under the Wildlife Act (1953). SBBG are often considered pests, especially near airports due to high risk of bird strike. Their large size, population abundance, wide distribution, and large daily movements make them one of the largest risks for hazardous bird strikes.
- 49) SBBG are one of the most abundant and familiar larger bird species found throughout New Zealand. They are the only large gull species found in New Zealand (weighing ~1 kg).
- 50) Within New Zealand, they use almost all non-forested habitats, both coastal and inland, as well as human-modified habitats.
- 51) Within the Wellington Region, the most significant breeding colonies are predominantly in coastal areas, on islands or well protected headlands. The primary breeding colonies are around Miramar Peninsula (Hue-te-taka/Moa Point), along the Wellington south coast (Tapu-te-Ranga Island and Siren Rocks), Pencarrow/Baring Head coastline, and Matiu/Somes Island. Nesting sites are also scattered along the Wellington coastline and on roofs of industrial buildings within the CBD, but at a lower concentration.
- 52) The population abundance and breeding colonies are monitored by WIAL, with culling events occurring when the number of nests exceed a pre-determined threshold (Figure 8).

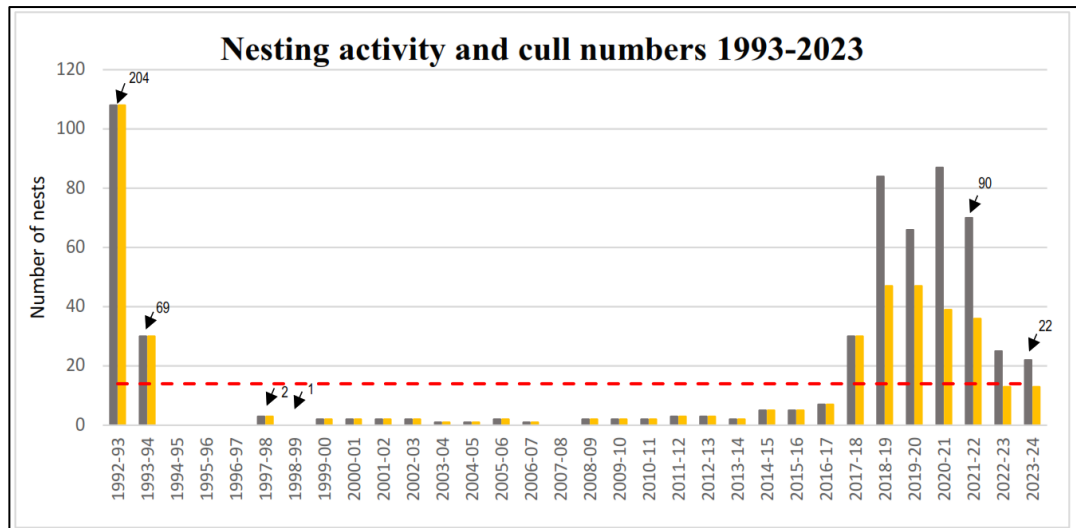


Figure 8. Number of SBBG nests found each year on Hue-te-taka/Moa Point from 1992 to 2024 (reproduced from WIAL, 2024¹⁴). Grey bars indicate total nest numbers and orange bars indicate active nests (i.e. contain eggs). Red dashed line represents the 15-year average of 14 nests. Arrows indicate when culls took place with numbers representing the number of adults culled.

- 53) Roosting locations are distributed throughout the Wellington district. Large numbers of SBBG roost together at sports fields, schools, beaches (e.g. Lyall Bay) and rooftops of large buildings.
- 54) SBBG are both predators and scavengers and have been recorded consuming a wide range of food types. Large numbers of SBBG are attracted to locations with a high concentration of food, scavenging organic waste from landfills, farms, fishing boats and processing factories. One of the most significant areas for attracting SBBG to forage within the Wellington City district is the Southern Landfill, where birds will commute to from throughout the district to forage daily.
- 55) In 2020 WIAL contracted Avisure to conduct a GPS tracking study of SBBG¹⁵. Five birds were captured at Lyall Bay, Owhiro Bay and the Southern Landfill and then tracked for 6-24 months (Appendix 3).
- 56) The most frequently visited sites were Matiu/Somes Island for breeding and the Southern Landfill for feeding. However, birds moved as far north as Paraparaumu and as far south as Seddon (South Island).

¹⁴ Wellington International Airport, (2024). Karoro/southern black-backed gull, *Larus dominicanus*, breeding season cull, 2023-2024. Hue te Taka.

¹⁵ Avisure (2020). Wellington International Airport Black-Backed Gull Program: Movement study final report.

57) Many of the tracks passed nearby WIAL or directly crossed the runway (Figure 9).



Figure 9. GPS fixes and main tracks that crossed the WIAL runway from the 5 tracked SBBG (reproduced from Avisure, 2020).

58) SBBG are the bird species that causes the greatest number of bird strike incidents at WIAL, accounting for 563 incidents (429 near strike,

134 strikes) since 2013 (Figure 10). This accounts for 45% (563/1251, including incidents with unidentified species) of all incidents during this period. The number of total incidents peaked in 2023 with 62, but the number of strikes was highest in 2017 with 18.

59) A culling event at local breeding colonies has been undertaken in response to high colony numbers and strike incidents in 2023.

60) Bird strike incidents by SBBG are highest in the morning (6-8am), with a second peak in the evening (7pm) (Figure 11). This is likely a combination of the rate of flight activity and increased movements by SBBG from overnight roosting/breeding sites to inland foraging events.

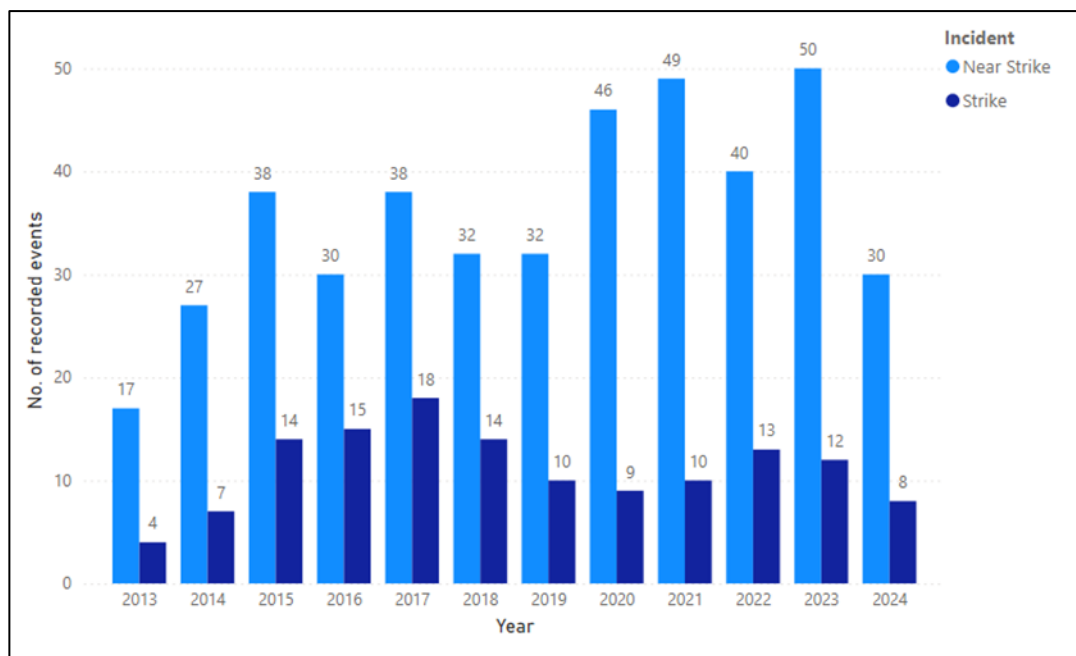


Figure 10. The number of bird strike incidents involving SBBG at WIAL. The total number of incidents peaked in 2023 with 62. Note that data for 2024 is up to September 15 only.

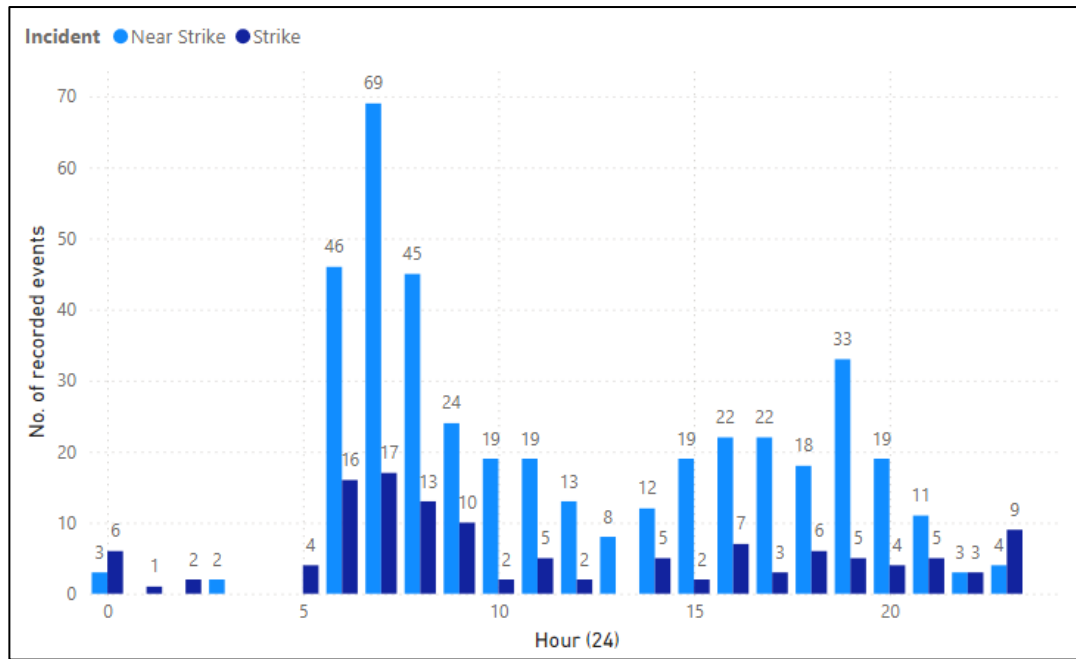


Figure 11. Number of bird strike incidents by SBBG at WIAL by time of day.

61) Land use activities that provide new food sources or new breeding locations have the potential to increase population abundance and hazardous movements across the landscape by SBBG. Any land use activity that provides a significant food source, such as a landfill, fish processing or abattoir/freezing works, has the potential to attract large numbers of SBBG, creating new daily movements by birds within 13 km that could intercept plane flight paths.

Goose species

62) The Canada Goose (*Branta canadensis*) and Greylag Goose (*Anser anser*) are both introduced species to New Zealand.

63) Canada Goose are a large (4.5-5.5 kg) flocking bird that grazes on pasture, young crops and aquatic plants. Their preferred habitat is primarily pastureland and locations next to large freshwater lakes and ponds. The total New Zealand population is estimated to be ~60,000¹⁶.

64) Within the Wellington Region, Canada Geese have only been recorded in eBird in low numbers (1-3 birds) in a few locations near Wellington City (Zealandia, Botanic Gardens and Wellington Harbour). Higher

¹⁶ Williams, M.J. 2013 [updated 2022]. Canada goose | Kuihi. In Miskelly, C.M. (ed.) *New Zealand Birds Online*. www.nzbirdsonline.org.nz

numbers have been recorded on Matiu Somes Island (Maximum: 25), Te Awa Kairangi/Hutt River (69), and near Pencarrow (Lake Kohangapiripiri: 43, Lake Kohangatera: 36).

65) Greylag geese are often referred to as domestic or feral geese. They are smaller than the Canada Goose, only weighing about 3 kg. They are frequently found in urban parks, pasture grass or adjacent to ponds in farmland. There are no current population estimates, but they are considered widespread, but likely to be in the low thousands¹⁷.

66) Within the Wellington Region, Greylag Geese have only been recorded in eBird in low numbers (1-3 birds) in a few locations near Wellington City (Zealandia, Botanic Gardens and Wellington Harbour) and the Te Awa Kairangi/Hutt River.

67) Only one incident with a goose (species not identified) has been recorded at WIAL from 2013-2024. This was a near miss that occurred in 2022.

68) Although incidents are infrequent, this species remain as a high risk, due to severity of a bird strike should it occur, due to their large size.

Mallard

69) Mallards (*Anas platyrhynchos*) are a duck species introduced to New Zealand from England. They are the most numerous and widespread duck species in New Zealand and weigh from 1-1.3 kg. They are most abundant in pastoral environments near water and feed on plant material, including seeds, grains, grasses, aquatic plants and human food scraps. They can also feed on freshwater and estuarine invertebrates¹⁸.

70) Mallards are found throughout Wellington City in coastal areas and urban parks and ponds. They are predominantly found in low numbers, with most ebird records being between 1-3 birds, with a maximum of 66 recorded in the upper dam at Zealandia.

¹⁷ Southey, I. 2013 [updated 2022]. Greylag goose | kuihi. In Miskelly, C.M. (ed.) *New Zealand Birds Online*. www.nzbirdsonline.org.nz

¹⁸ Williams, M.J. 2013 [updated 2022]. Mallard | rakiraki. In Miskelly, C.M. (ed.) *New Zealand Birds Online*. www.nzbirdsonline.org.nz

71) Bird strike incidents are not common with only two near strikes recorded (2016 and 2021) and one strike (2016). They remain as a high risk species due to severity of a bird strike should it occur, due to their large size.

Rock Pigeon

72) Rock pigeons (*Columba livia*), also known as feral pigeons, are an introduced species to New Zealand and found throughout the country. They are typically confined to towns, cities, and agricultural land, where they breed on ledges of buildings or in caves or cliffs. They feed on a wide variety of foods, particularly human foods, which explains their successful colonisation of most continents and climates. They are a widespread species and their populations are increasing¹⁹.

73) Rock pigeons are abundant throughout the Wellington City district, particularly within the CBD.

74) Bird strikes are semi-regular with 1-4 strikes recorded per year. Since 2013, there have been 8 near misses and 22 strikes recorded.

Spur-winged Plover

75) Spur-winged plover (*Vanellus miles*) considered a native species, but along with the SBBG, are not protected by the Wildlife Act. They were first recorded breeding in New Zealand near Invercargill in 1932 and have since spread throughout the rest of the country. They are a large, stocky wader, weighing 350-370 grams²⁰.

76) Spur-winged plovers are now widespread and found in a wide range of open habitats, usually with low vegetation. They succeed in human modified habitats, which is responsible for their success in colonising New Zealand. There are no accurate population estimates, but they are likely to still be increasing in number.

¹⁹ Powlesland, R.G. 2013 [updated 2022]. Rock pigeon | kererū aropari. In Miskelly, C.M. (ed.) *New Zealand Birds Online*. www.nzbirdsonline.org.nz

²⁰ Woodley, K. 2013. Spur-winged plover in Miskelly, C.M. (ed.) *New Zealand Birds Online*. www.nzbirdsonline.org.nz

77) They are common around the Wellington City district, predominantly in open sports fields, parks and areas with pasture. Although less common in the central city, they are a common sight in urban areas.

78) They are a well-known risk for bird strike, with their frequency increasing over time, with CAA records showing that the proportion of incidents nationwide where spur-winged plovers were involved increased from 8% in 1988 to 22% in 1991.

79) At WIAL, spur-winged plovers have accounted for 5.9% (74/1251) of all incidents, but 9% (29/322) of all strikes. The number of incidents is likely increasing over time with 3 in 2013, then peaking at 17 in 2022 (16 in 2023).

CONCLUSION

80) Overall, I consider that:

- a) the activities specified as a Bird Strike Risk Activity can contribute to bird strike risk in the context of Wellington Airport; and
- b) the 13km and 8 km radii are supportable based on the known habitat use, current distribution, and movements of the bird species in question as described above.

Dr Michael Anderson

23 October 2024

Appendix 1. Proposed 8 and 13 km zones around WIAL that would limit land-use activities. Key off-airport locations that are currently monitored for bird population abundance are also indicated.



Legend

Wellington Airport Property

Off-airport monitoring sites

Bird Strike Risk Activity Zones

8km buffer

13km buffer

Proposed Bird Strike Risk Activity Zones
(Wellington International Airport Limited)

23/10/2024 Map:MA | Scale @ A3: 100000

Bioresearches  

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all information should be independently verified.

Appendix 2: Heatmap of Southern Black Backed Gull records (Citizen science data, source: GBIF.org) within the proposed 8, and 13 kilometre buffer zones. Heatmap is weighted by the number of individual birds counted for each record, not just the number of records.

Note that this data should be interpreted with caution, as data is sourced from all available citizen science projects (e.g. eBird, inaturalist, Landcare backyard survey) and other records (e.g. Museum records) from 1872-2023. The accuracy of each record regarding the location or the numbers of birds counted is also not verified.



Legend

Wellington Airport Property	SBBG_Heatmap
Off-airport monitoring sites	<= 2549
Bird Strike Risk Activity Zones	2549 - 5098
3km Buffer	5098 - 7647
13km buffer	7647 - 10196
	10196 - 12745
	12745 - 15293
	15293 - 17842
	17842 - 20391
	20391 - 22940
	> 22940

Proposed Bird Strike Risk Activity Zones
(Wellington International Airport Limited)

17/09/2024 Map:MA	Scale @ A3: 100000
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Appendix 3: Maps of SBBG tracking study for 5 individual birds. Each map is for an individual bird and indicate track density and frequency of movements between key sites.

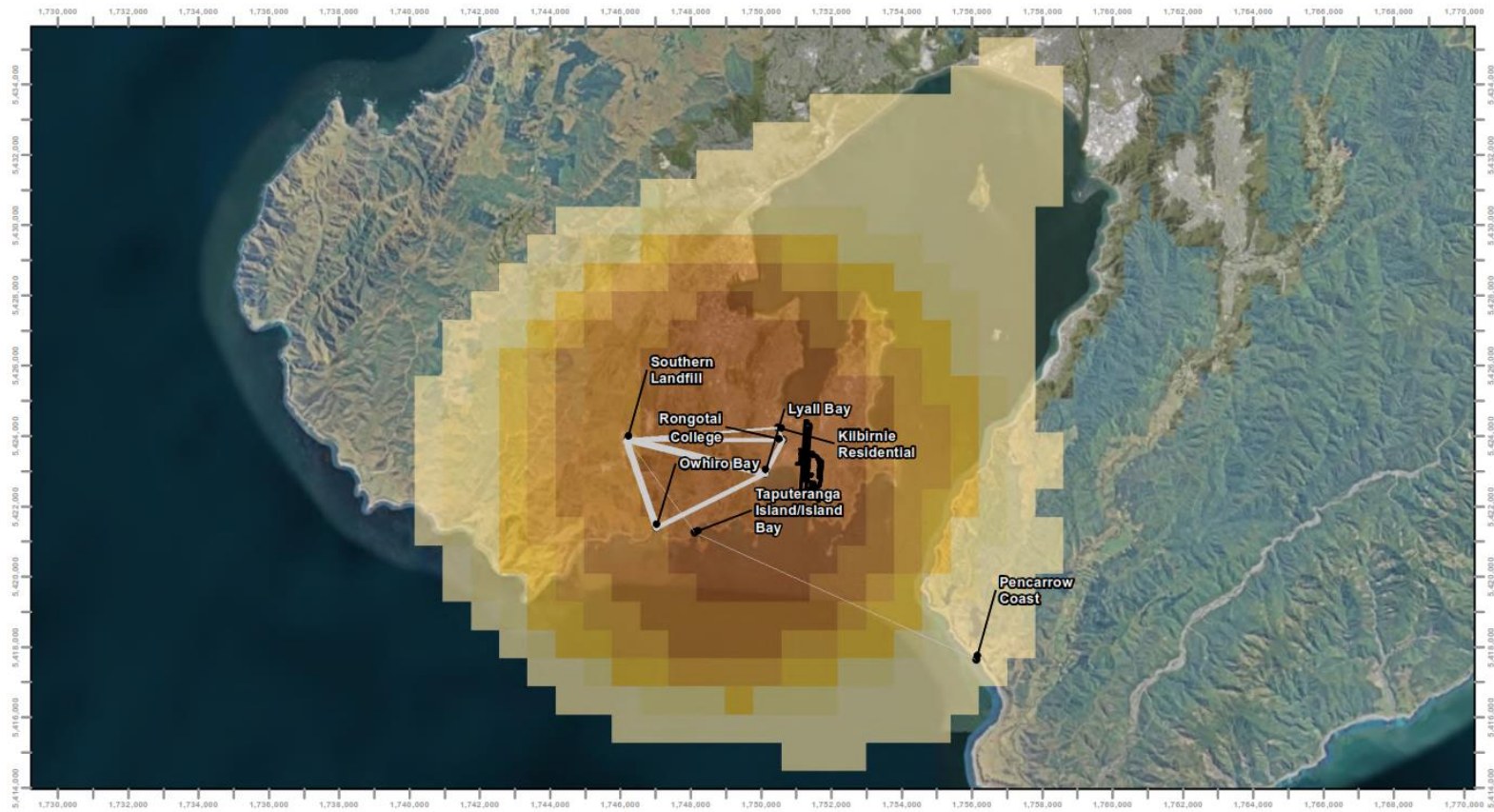


Figure 7: BAGU01 tracks

Wellington International Airport
 Black-backed Gull Movement Study DRAFT



Job number: PR2738
 Revision: 0
 Author: EK
 Date: 5/02/2020



NZGD 2000 New Zealand Transverse Mercator
 Projection: Transverse Mercator
 Datum: NZGD 2000
 Units: Meter

Data Sources: Avisure, 2019; Image Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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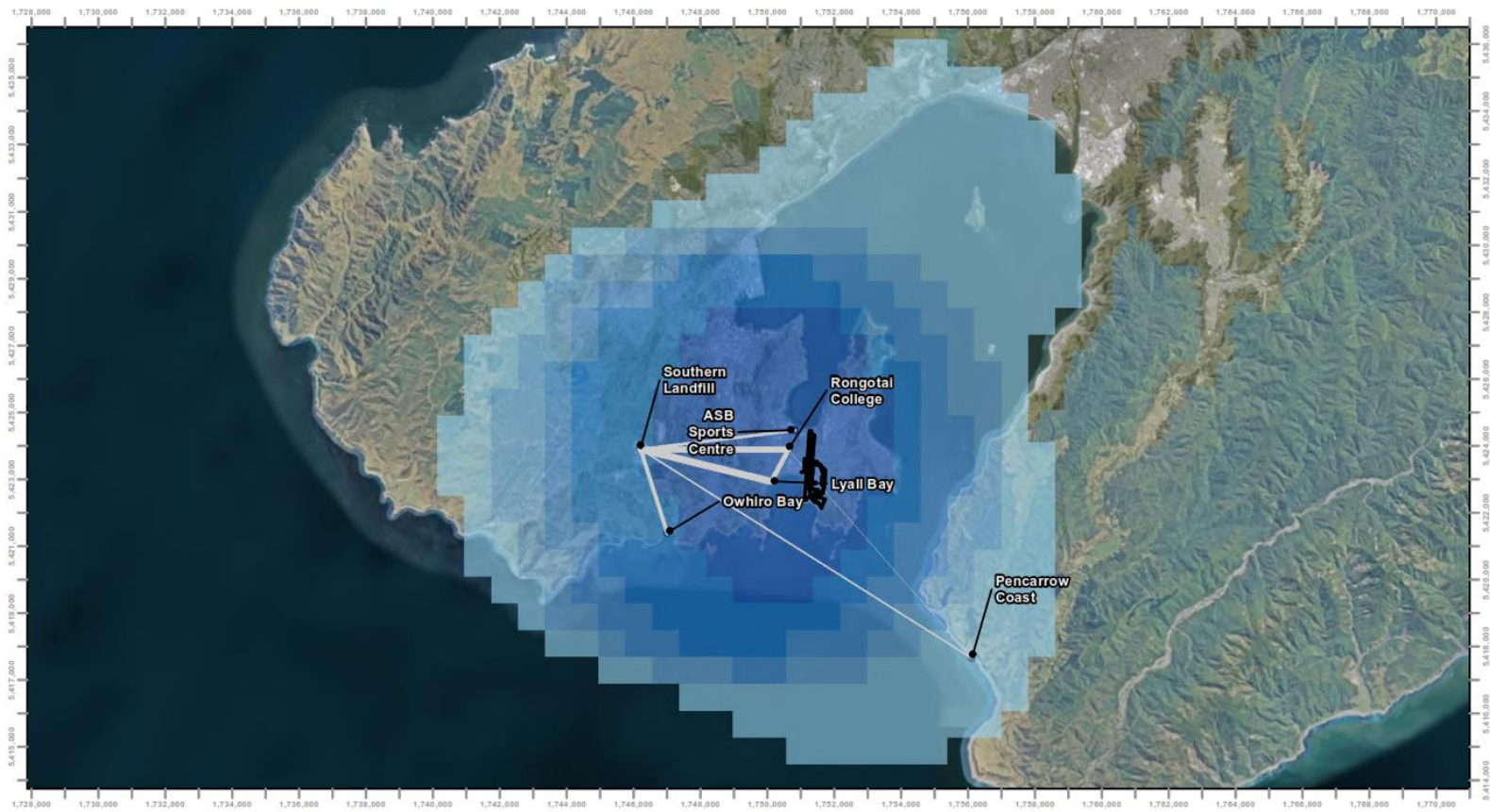
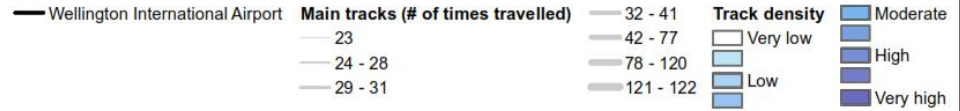


Figure 8: BAGU02 tracks

Wellington International Airport
 Black-backed Gull Movement Study DRAFT



Job number: PR2736
 Revision: 0
 Author: EK
 Date: 9/02/2020

NZGD 2000 New Zealand Transverse Mercator
 Projection: Transverse Mercator
 Datum: NZGD 2000
 Units: Meter

Data Sources: Avisure, 2019. Image: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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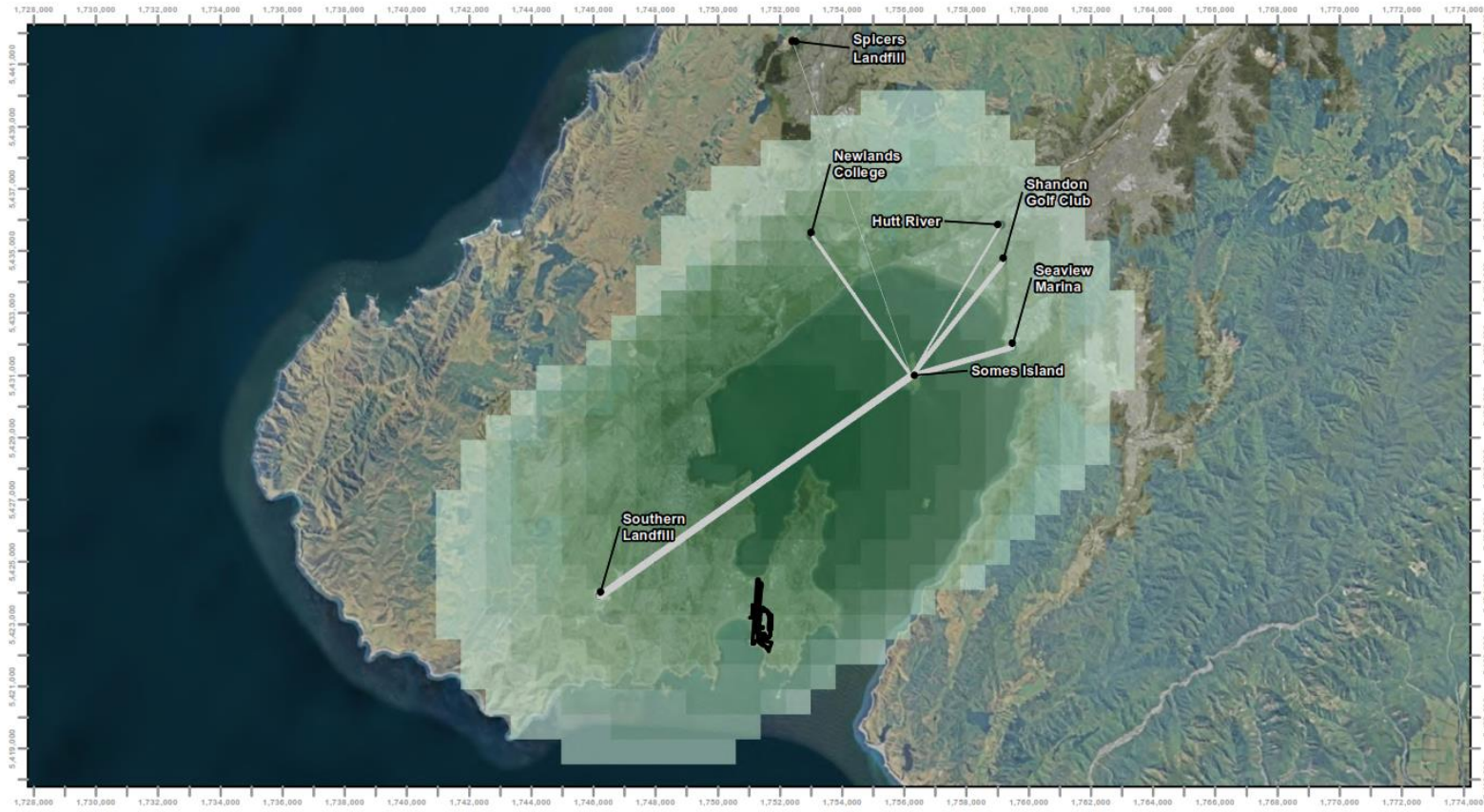
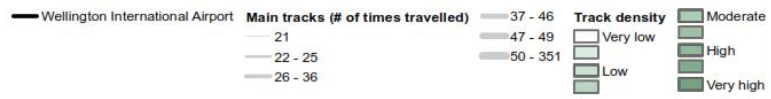


Figure 9: BAGU03 tracks

Wellington International Airport
 Black-backed Gull Movement Study DRAFT



Job number: PR2738
 Revision: 0
 Author: EK
 Date: 5/02/2020

NZGD 2000 New Zealand Transverse Mercator
 Projection: Transverse Mercator
 Datum: NZGD 2000
 Units: Meter

Data Sources: Avisure, 2019. Image: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community. AVISURE does not warrant the accuracy or completeness of information displayed in this map and any person using it does so at their own risk. AVISURE shall bear no responsibility or liability for any errors, faults, defects, or omissions in the information. PR2738_MPX_BAGU03_01maintracks A4

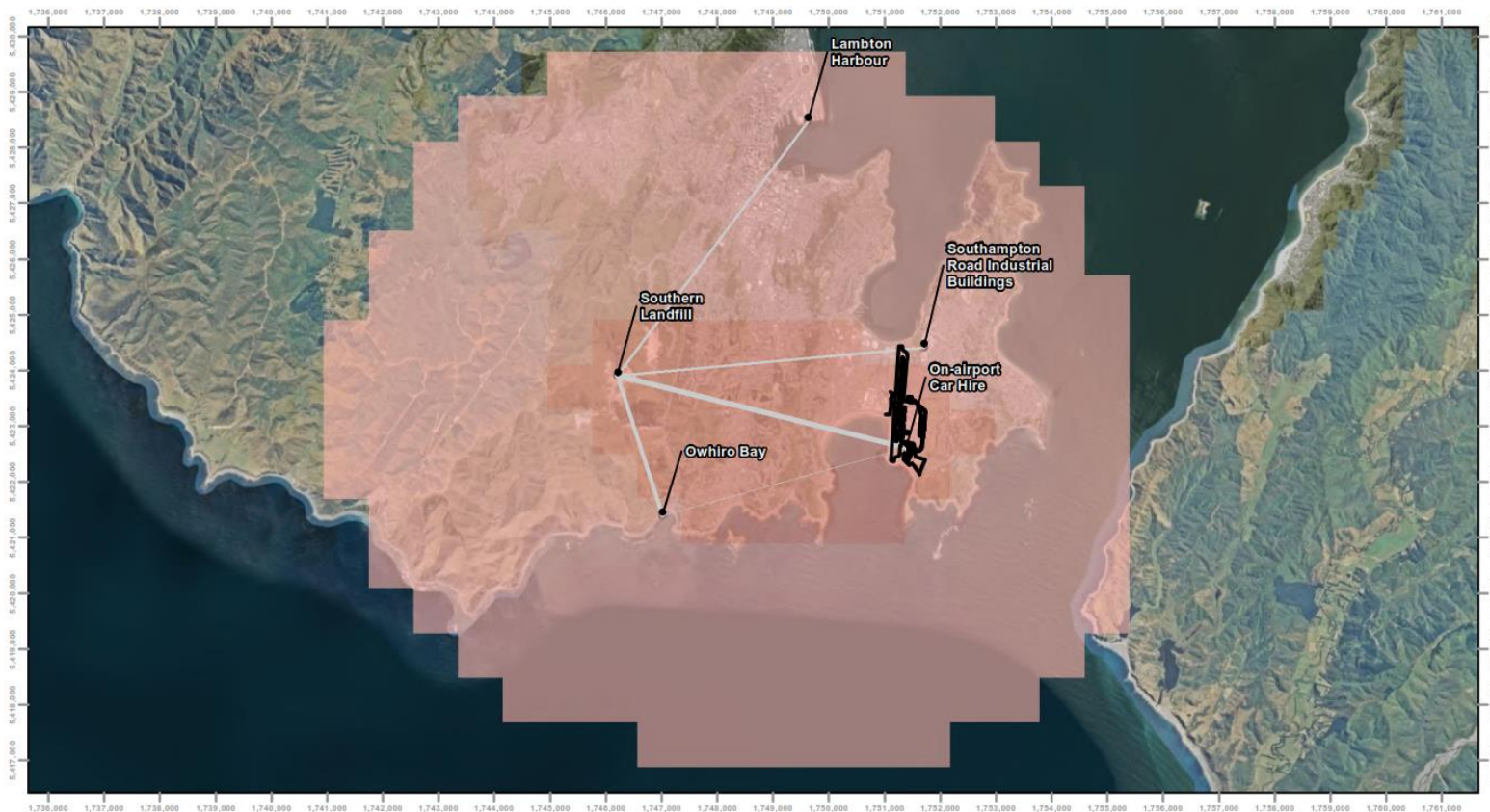
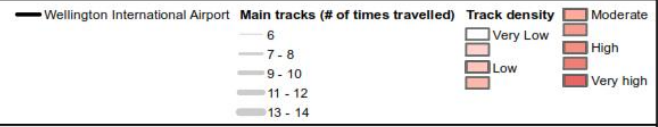


Figure 10: BAGU04 tracks

Wellington International Airport
 Black-backed Gull Movement Study DRAFT



Job number: PR2735
 Revision: 0
 Author: EK
 Date: 5/02/2020

0 1 2 4
 Kilometers

NZGD 2000 New Zealand Transverse Mercator
 Projection: Transverse Mercator
 Datum: NZGD 2000
 Units: Meter

Data Sources: Avibase, 2019; Image: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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PR2735_MPA_BAGU04_maintrack 24

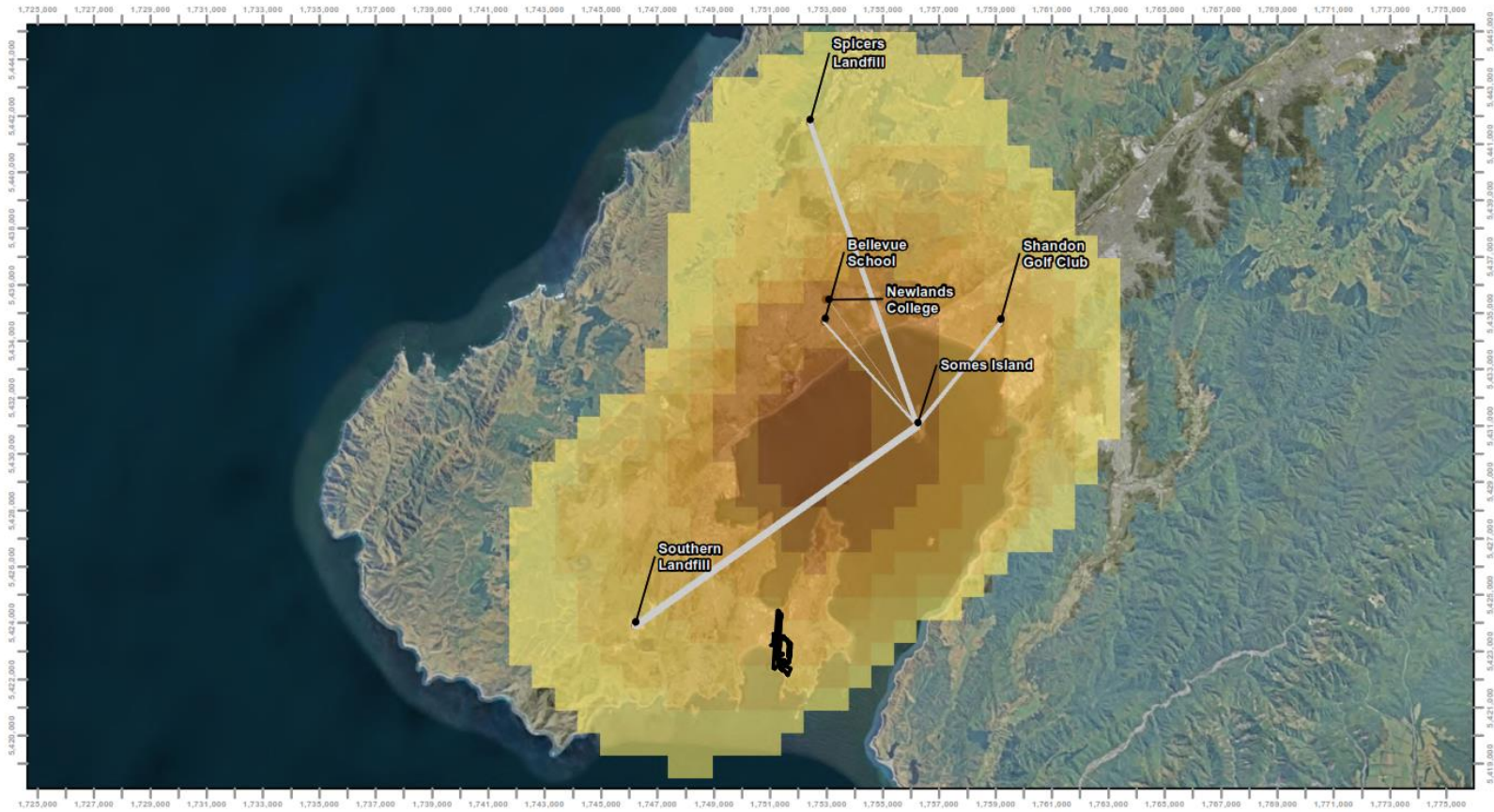


Figure 11: BAGU05 tracks

Wellington International Airport
 Black-backed Gull Movement Study DRAFT



Job number: PR2735
 Revision: 0
 Author: EK
 Date: 9/02/2020

NZGD 2000 New Zealand Transverse Mercator
 Projection: Transverse Mercator
 Datum: NZGD 2000
 Units: Meter

Data Sources: Avisure, 2019; Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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