CIVIL AVIATION AUTHORITY
OF NEW ZEALAND

Te Mana Rererangi Tūmatanui o Aotearoa

Bird Incident Rate Report

October to December 2016

Introduction

Bird incident rates are reported quarterly by aerodrome. This is achieved by querying the database for the number of incidents at aerodromes and summarising by quarter. The results of this query are then divided by the aircraft movements at each aerodrome for the same quarter and multiplied by 10,000 to achieve strikes per 10,000 aircraft movements. Aircraft movements at aerodromes are obtained from the ACNZ, and where available, from individual airport companies. Where no movement data are available, CAA estimates are used. Aerodrome operators are invited to supply more accurate movement data where appropriate.

Definition of 'On-Aerodrome'

Not all bird strike incidents occur within the wildlife management area that relates to the aerodrome stated in the incident report so this report breaks incidents down into 'On aerodrome', 'Off aerodrome' and 'Undefined'.

An "on airport" bird strike is defined within IBIS (ICAO Bird Strike Information System) as one which occurs between 0 to 200 ft inclusive on landing and 0 to 500 ft inclusive on take-off. This definition doesn't align well with the level of 50 ft that is widely used in NZ as the boundary between take-off and climb and between approach and landing. This misalignment makes it inappropriate to use the reported 'Phase of Flight' as the sole factor in determining whether a reported strike is on or off an aerodrome.

This report therefore makes the following assumptions:

1. If the distance from the airport is greater than 5 NM the strike is **Off Aerodrome**
2. If no altitude is reported the strike is **Off Aerodrome** if the flight phase is Cruise or Holding, **On Aerodrome** if the flight phase is Taxiing, Hover Taxi, Takeoff or Landing and **Undefined** in all other cases
3. If the altitude is reported as zero the strike is **Undefined** if the flight phase is Parked or Unknown otherwise it is **On Aerodrome**
4. If the altitude is reported as greater than zero but not greater than 200 feet the strike is **Undefined** if the flight phase is Parked, Unknown or Taxiing otherwise it is **On Aerodrome**
5. If the altitude is reported as greater than 200 ft but not greater than 500 ft the strike is **On Aerodrome** if the flight phase is Takeoff or Climb, **Off Aerodrome** if the flight phase is Approach, Descent or Landing and **Undefined** otherwise
6. If the altitude is reported as greater than 500 ft the strike is **Undefined** if the flight phase is Parked, Taxiing, Hover Taxi or Unknown and **Off Aerodrome** otherwise

These rules are applied in the above order with later rules having no effect if a strike meets the conditions of an earlier rule.

On-Aerodrome 12-Month Moving Average Strike Rate per 10,000 Aircraft Movements

The following table shows the 12-month moving average on-aerodrome strike rates for identified aerodromes for the three years ending 31 December 2016.

	Quarter											
Aerodrome	**14/1**	**14/2**	**14/3**	**14/4**	**15/1**	**15/2**	**15/3**	**15/4**	**16/1**	**16/2**	**16/3**	**16/4**
Auckland	2.3	1.7	2.1	2.0	2.2	3.1	3.1	2.9	2.4	1.6	1.2	1.4
Chatham Islands	0.0	0.0	10.0	20.0	20.0	20.0	10.0	0.0	0.0	0.0	0.0	0.0
Christchurch	2.7	2.6	2.6	2.2	2.3	2.2	2.8	3.4	2.8	3.2	3.7	3.4
Dunedin	6.4	5.1	4.9	4.8	3.1	4.0	4.3	3.9	4.9	4.1	6.0	5.4
Gisborne	5.8	5.8	7.3	10.7	9.3	8.3	6.8	3.1	4.5	5.0	4.5	4.6
Hamilton	1.3	1.6	1.5	0.9	1.0	0.9	0.8	0.9	0.9	0.8	1.0	1.1
Hokitika	3.6	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Invercargill	1.8	5.6	8.4	10.0	10.3	8.4	6.3	5.0	4.3	4.3	4.2	4.1
Kerikeri	8.8	6.3	5.0	3.8	2.5	1.3	1.3	1.3	0.0	1.3	1.3	1.3
Manapouri	0.0	0.0	0.0	0.0	27.5	27.5	27.5	27.5	0.0	0.0	27.5	27.5
Napier	6.2	6.2	6.8	7.5	7.5	6.3	8.3	7.5	10.0	8.9	8.4	10.5
Nelson	3.1	2.0	2.8	3.2	3.9	5.5	4.8	4.0	4.5	5.0	5.9	6.8
New Plymouth	3.4	1.7	3.0	4.1	6.1	5.7	5.0	4.6	2.6	3.6	3.6	3.6
Ohakea	2.0	4.2	4.3	4.9	5.0	3.2	2.8	2.4	3.4	4.0	4.4	4.4
Palmerston North	4.8	3.3	3.1	2.5	2.4	2.6	2.9	3.2	2.9	2.3	2.9	2.1
Paraparaumu	1.9	1.7	1.2	1.2	1.2	1.9	1.9	1.9	1.9	0.0	0.0	0.0
Queenstown	1.8	1.6	2.1	1.8	1.9	1.7	1.2	1.4	1.0	2.8	2.6	2.7
Rotorua	3.8	2.8	3.9	3.0	3.0	3.6	2.6	4.7	3.7	2.7	3.3	1.2
Taupo	0.9	0.9	0.4	0.4	0.4	0.5	0.9	0.9	0.9	0.4	0.5	1.0
Tauranga	2.6	3.1	2.6	1.9	2.2	1.5	1.7	1.7	1.3	2.1	2.5	2.9
Timaru	5.0	2.5	3.8	2.5	1.3	1.3	0.0	0.0	3.3	3.5	3.6	3.6
Wanganui	6.3	4.2	4.2	2.8	4.2	3.5	2.7	1.9	1.9	1.2	1.0	0.9
Wellington	2.3	2.0	1.8	2.5	2.5	3.3	3.3	2.6	2.3	1.6	1.6	1.5
Westport	0.0	4.8	4.8	9.7	14.5	9.7	14.5	9.7	4.8	4.8	0.0	0.0
Whakatane	2.5	4.2	3.3	4.2	4.2	3.3	2.5	1.7	1.7	1.7	1.7	1.7
Whangarei	6.8	5.3	1.5	2.3	2.3	1.5	1.6	0.0	0.0	1.7	1.6	1.5
Whenuapai	6.9	6.3	6.5	8.7	7.1	7.5	6.7	3.5	4.3	4.5	5.7	4.9
Woodbourne	5.5	3.3	4.3	5.4	6.8	6.1	5.1	5.4	3.1	1.8	1.9	1.0
Overall	3.1	2.8	2.9	3.0	3.1	3.2	3.1	2.8	2.6	2.4	2.6	2.6

Data with a pink background is based on CAA estimates of aircraft movements for the aerodrome because the CAA has either no data or incomplete data for that aerodrome.

Analysis

Each aerodrome is assigned a risk category based on the most recent 12 month average bird strike rate per 10,000 aircraft movements. These categories are:

Low	where the rate is less than 5 strikes per 10,000 movements
Medium	where the rate is not less than 5 strikes per 10,000 movements but less than 10 strikes per 10,000 movements
High	where the rate is not less than 10 strikes per 10,000 movements.

Each aerodrome is also assigned a trend category based on a straight line approximation to the 3 year history of bird strike rates. These categories are:

Trending down	where the trend graph has a slope of less than -0.059 strikes per 10,000 movements
Constant	where the trend graph has a slope of between -0.059 and +0.059 strikes per 10,000 movements
Trending up	where the trend graph has a slope of more than +0.059 strikes per 10,000 movements

The CAA then determines what if any actions are required based on the combination of the above categories

Current details for individual aerodromes are shown in the following table.

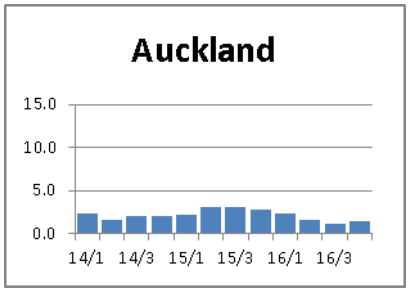
Aerodrome	Incident Rate	Trend
Auckland	Low	Constant
Chatham Islands	Low	Downward
Christchurch	Low	Upward
Dunedin	Medium	Constant
Gisborne	Low	Downward
Hamilton	Low	Constant
Hokitika	Low	Downward
Invercargill	Low	Downward
Kerikeri	Low	Downward
Manapouri	High	Upward
Napier	High	Upward
Nelson	Medium	Upward
New Plymouth	Low	Constant
Ohakea	Low	Constant
Palmerston North	Low	Downward
Paraparaumu	Low	Downward
Queenstown	Low	Upward
Rotorua	Low	Downward
Taupo	Low	Constant
Tauranga	Low	Constant
Timaru	Low	Constant
Wanganui	Low	Downward
Wellington	Low	Constant
Westport	Low	Downward
Whakatane	Low	Downward
Whangarei	Low	Downward
Whenuapai	Low	Downward
Woodbourne	Low	Downward
Overall	Low	Constant

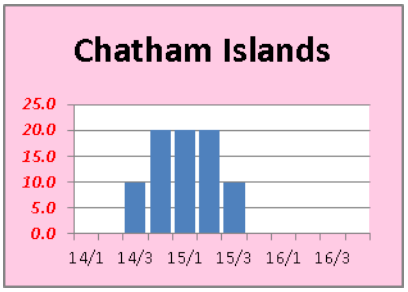
The following table summarises the numbers of aerodromes in each Risk/Trend Category.

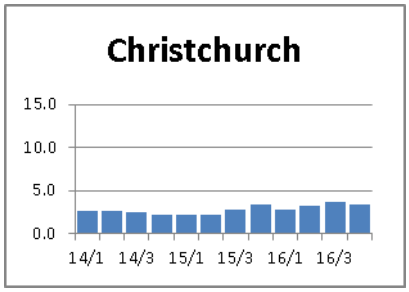
	Trend			
Risk Category	Downward	Constant	Upward	Total
Low	14	8	2	24
Medium	0	1	1	2
High	0	0	2	2
Total	14	9	5	28

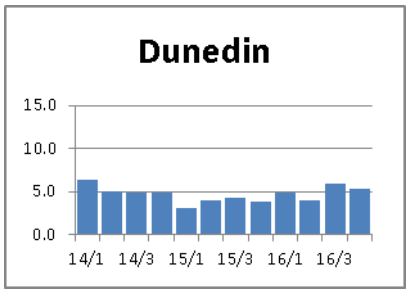
The graphs that follow show the 12 month moving average on-aerodrome bird-strike rates per 10,000 movements for each monitored aerodrome for the three year period ending 30 September 2016.

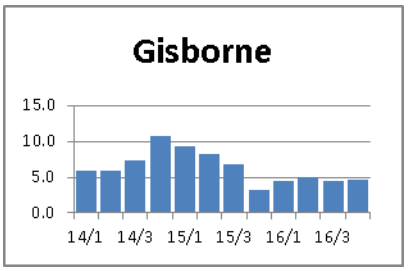
Graphs with a pink background are based on CAA estimates of aircraft movements for the aerodrome because the CAA has either no data or incomplete data for that aerodrome.

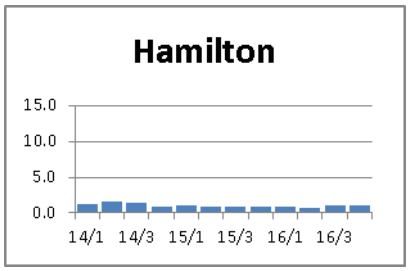


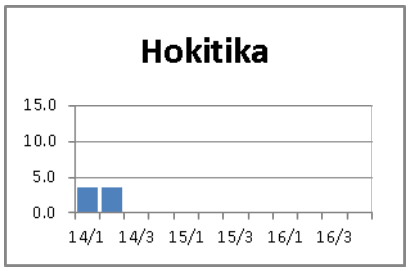


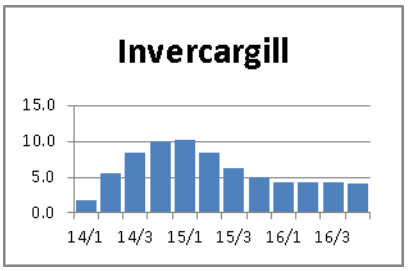


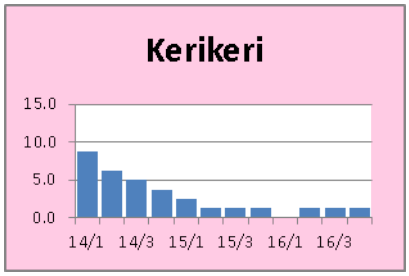


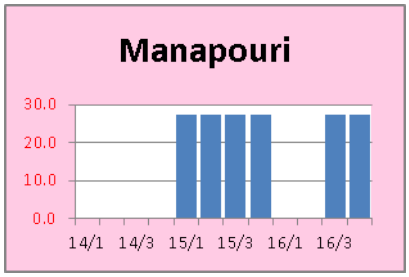


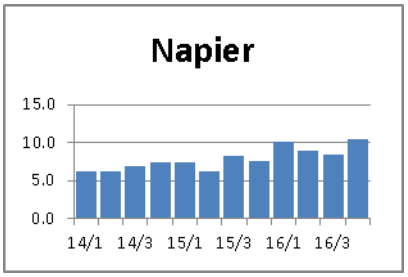


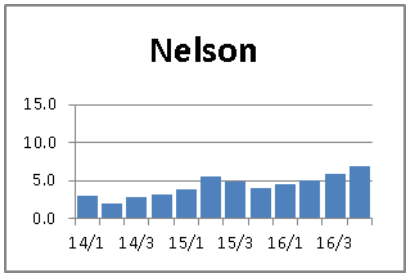


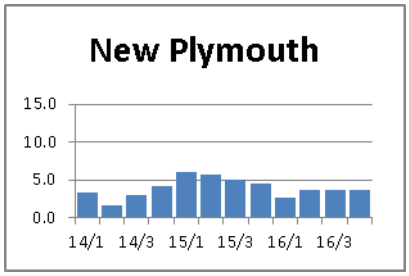








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10.0
5.0
0.0
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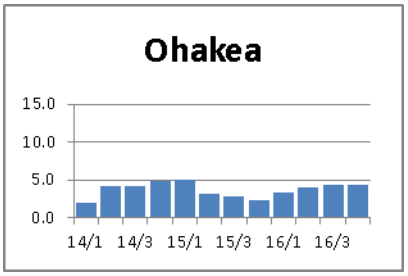
Ohakea
15.0
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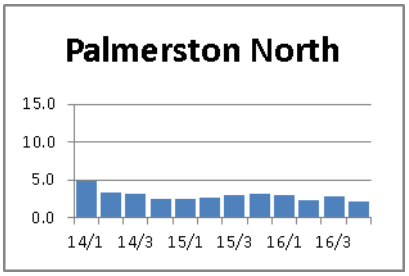
5.0
0.0
14/1 14/3 15/1 15/3 16/1 16/3


Palmerston North
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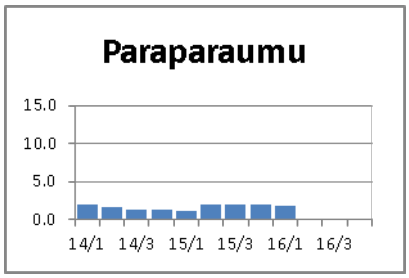
Paraparaumu
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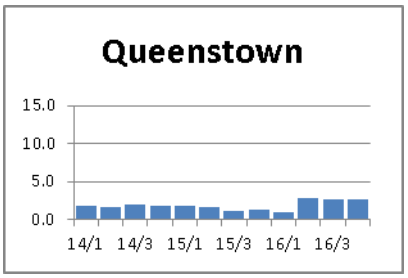
Queenstown
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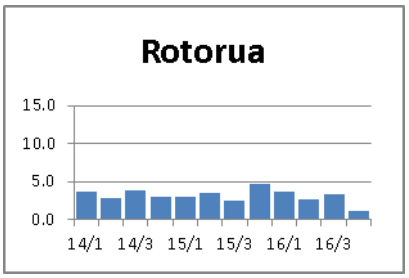
Rotorua
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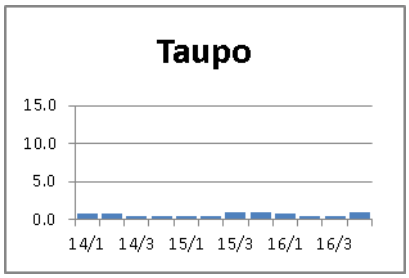
Taupo
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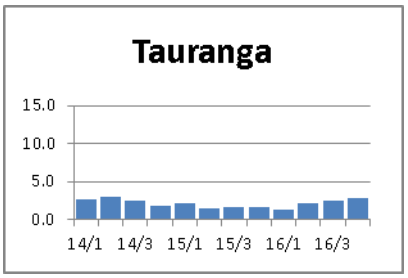
Tauranga
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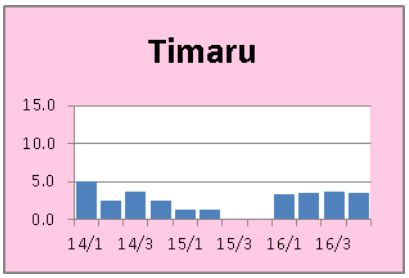
Timaru
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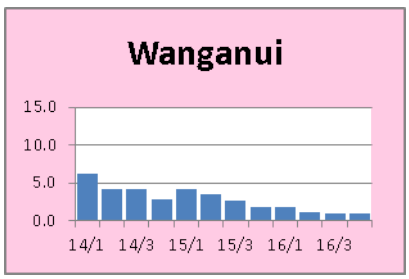
Wanganui
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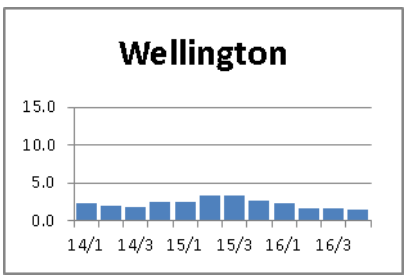
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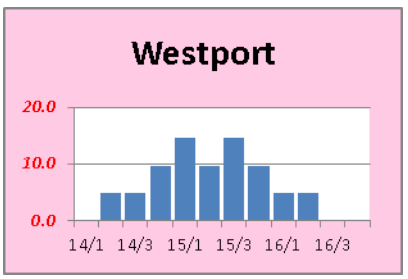
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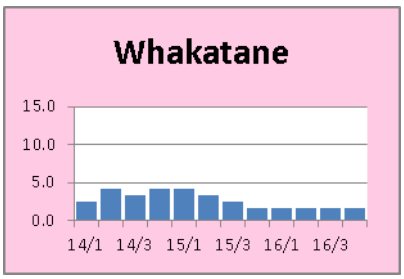
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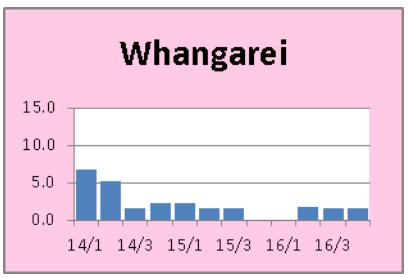
Whangarei
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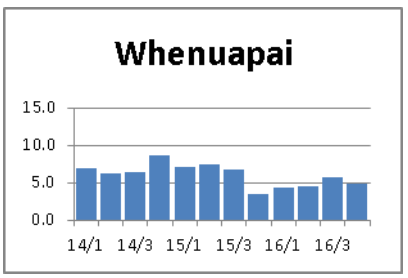
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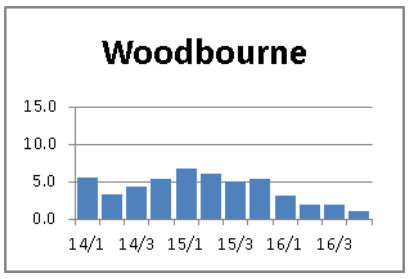
Woodbourne
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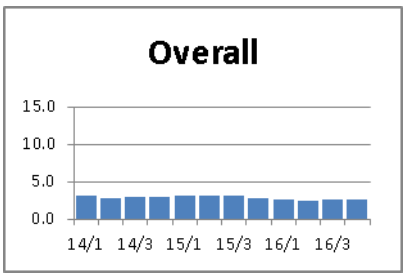
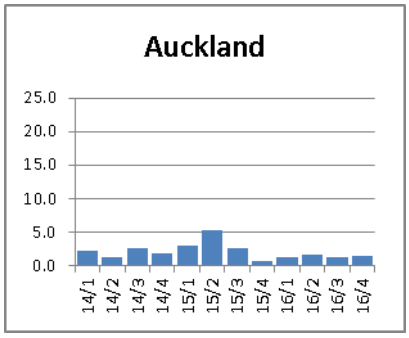

Overall
15.0
10.0
5.0
0.0
14/1 14/3 15/1 15/3 16/1 16/3

On-Aerodrome Quarterly Strike Rate per 10,000 Aircraft Movements

The following table and graphs show the quarterly on-aerodrome strike rates for identified aerodromes for the three year period ending 31 December 2016.

	Quarter											
Aerodrome	**14/1**	**14/2**	**14/3**	**14/4**	**15/1**	**15/2**	**15/3**	**15/4**	**16/1**	**16/2**	**16/3**	**16/4**
Auckland	2.3	1.7	2.1	2.0	2.2	3.1	3.1	2.9	2.4	1.6	1.2	1.4
Chatham Islands	0.0	0.0	10.0	20.0	20.0	20.0	10.0	0.0	0.0	0.0	0.0	0.0
Christchurch	2.7	2.6	2.6	2.2	2.3	2.2	2.8	3.4	2.8	3.2	3.7	3.4
Dunedin	6.4	5.1	4.9	4.8	3.1	4.0	4.3	3.9	4.9	4.1	6.0	5.4
Gisborne	5.8	5.8	7.3	10.7	9.3	8.3	6.8	3.1	4.5	5.0	4.5	4.6
Hamilton	1.3	1.6	1.5	0.9	1.0	0.9	0.8	0.9	0.9	0.8	1.0	1.1
Hokitika	3.6	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Invercargill	1.8	5.6	8.4	10.0	10.3	8.4	6.3	5.0	4.3	4.3	4.2	4.1
Kerikeri	8.8	6.3	5.0	3.8	2.5	1.3	1.3	1.3	0.0	1.3	1.3	1.3
Manapouri	0.0	0.0	0.0	0.0	27.5	27.5	27.5	27.5	0.0	0.0	27.5	27.5
Napier	6.2	6.2	6.8	7.5	7.5	6.3	8.3	7.5	10.0	8.9	8.4	10.5
Nelson	3.1	2.0	2.8	3.2	3.9	5.5	4.8	4.0	4.5	5.0	5.9	6.8
New Plymouth	3.4	1.7	3.0	4.1	6.1	5.7	5.0	4.6	2.6	3.6	3.6	3.6
Ohakea	2.0	4.2	4.3	4.9	5.0	3.2	2.8	2.4	3.4	4.0	4.4	4.4
Palmerston North	4.8	3.3	3.1	2.5	2.4	2.6	2.9	3.2	2.9	2.3	2.9	2.1
Paraparaumu	1.9	1.7	1.2	1.2	1.2	1.9	1.9	1.9	1.9	0.0	0.0	0.0
Queenstown	1.8	1.6	2.1	1.8	1.9	1.7	1.2	1.4	1.0	2.8	2.6	2.7
Rotorua	3.8	2.8	3.9	3.0	3.0	3.6	2.6	4.7	3.7	2.7	3.3	1.2
Taupo	0.9	0.9	0.4	0.4	0.4	0.5	0.9	0.9	0.9	0.4	0.5	1.0
Tauranga	2.6	3.1	2.6	1.9	2.2	1.5	1.7	1.7	1.3	2.1	2.5	2.9
Timaru	5.0	2.5	3.8	2.5	1.3	1.3	0.0	0.0	3.3	3.5	3.6	3.6
Wanganui	6.3	4.2	4.2	2.8	4.2	3.5	2.7	1.9	1.9	1.2	1.0	0.9
Wellington	2.3	2.0	1.8	2.5	2.5	3.3	3.3	2.6	2.3	1.6	1.6	1.5
Westport	0.0	4.8	4.8	9.7	14.5	9.7	14.5	9.7	4.8	4.8	0.0	0.0
Whakatane	2.5	4.2	3.3	4.2	4.2	3.3	2.5	1.7	1.7	1.7	1.7	1.7
Whangarei	6.8	5.3	1.5	2.3	2.3	1.5	1.6	0.0	0.0	1.7	1.6	1.5
Whenuapai	6.9	6.3	6.5	8.7	7.1	7.5	6.7	3.5	4.3	4.5	5.7	4.9
Woodbourne	5.5	3.3	4.3	5.4	6.8	6.1	5.1	5.4	3.1	1.8	1.9	1.0
Overall	3.1	2.8	2.9	3.0	3.1	3.2	3.1	2.8	2.6	2.4	2.6	2.6

Data with a pink background is based on CAA estimates of aircraft movements for the aerodrome because the CAA has either no data or incomplete data for that aerodrome.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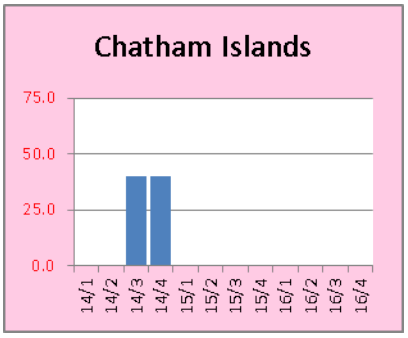
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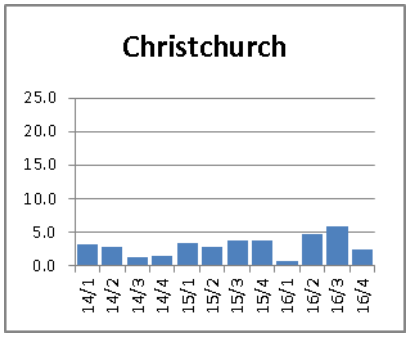
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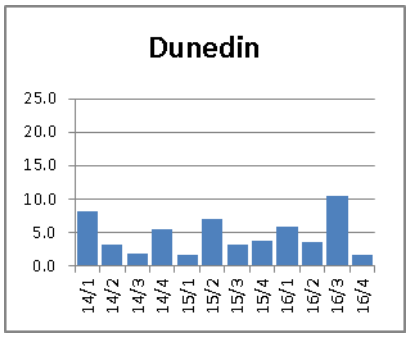
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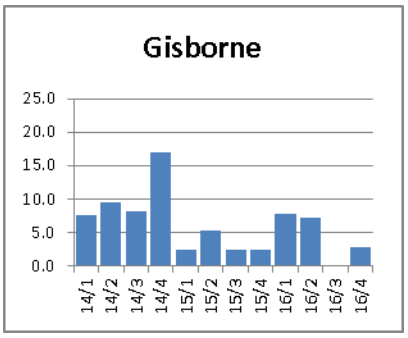
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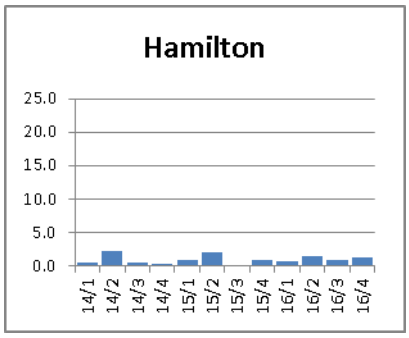
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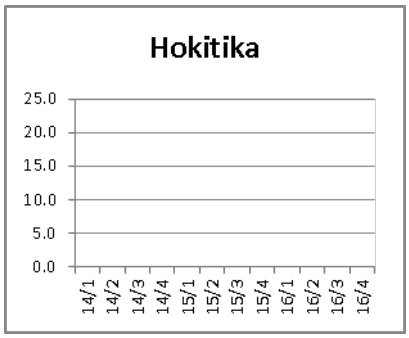
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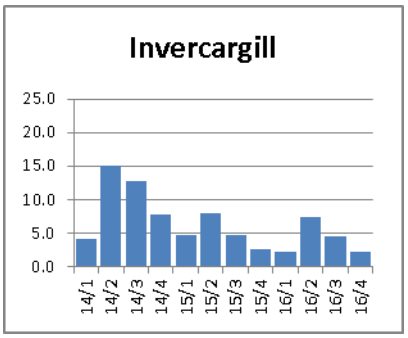
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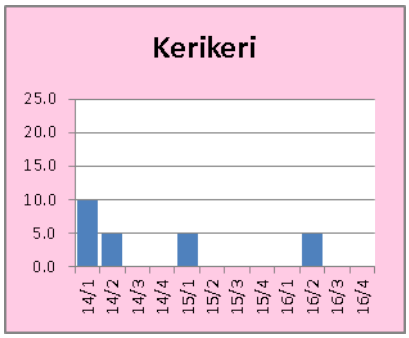
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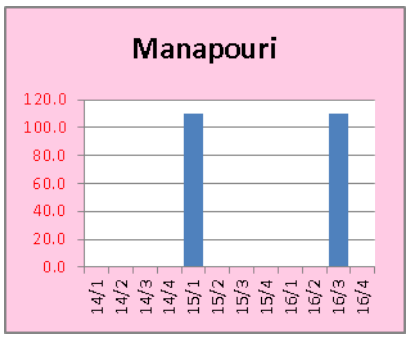
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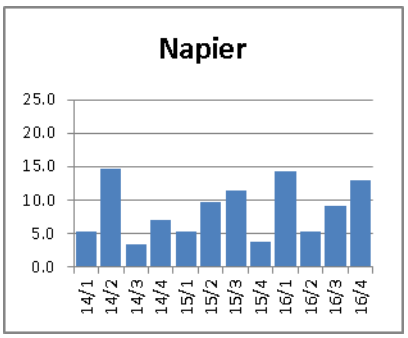
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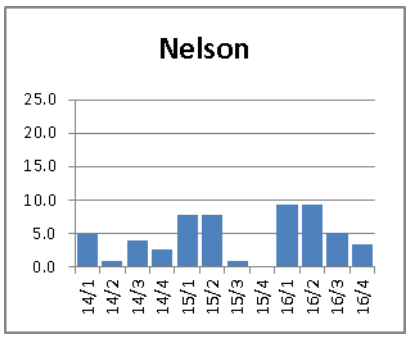
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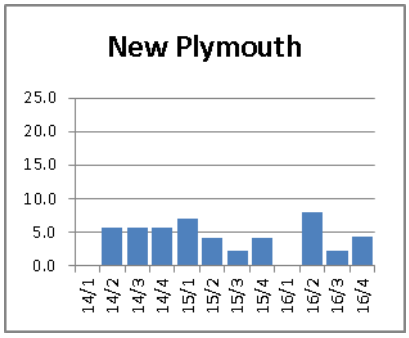
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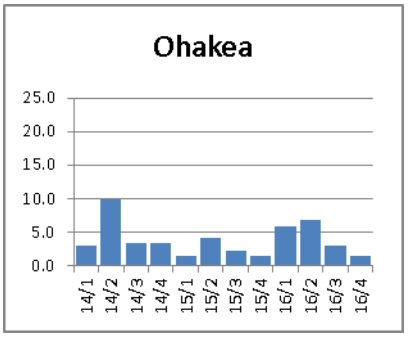
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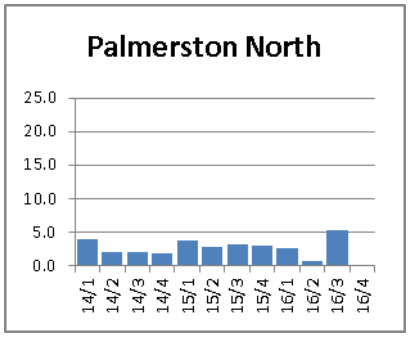
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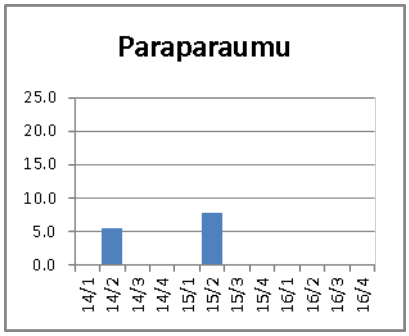
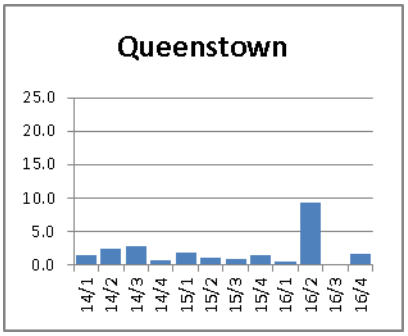
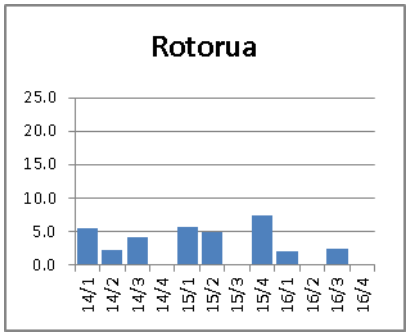
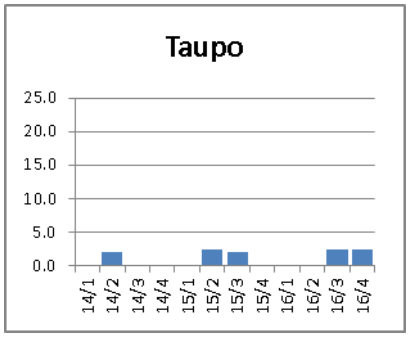
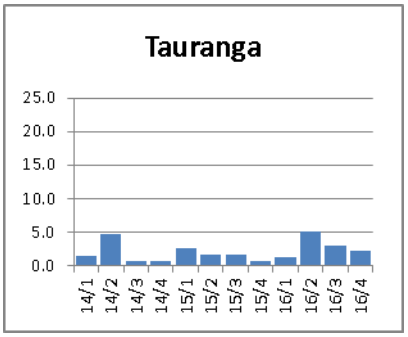
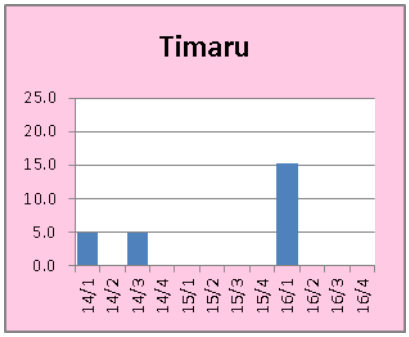


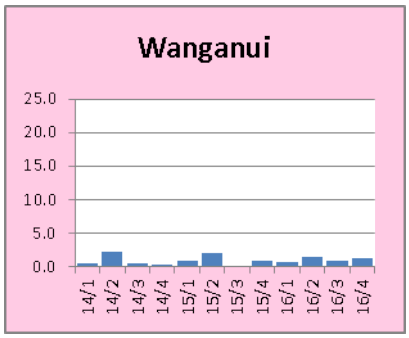


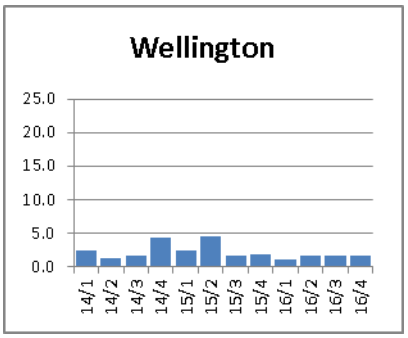


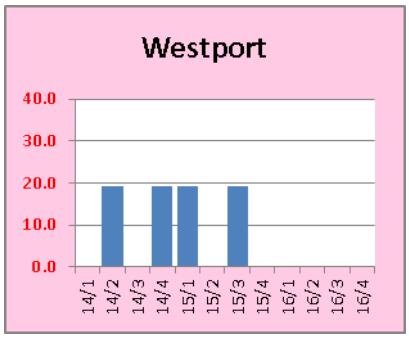


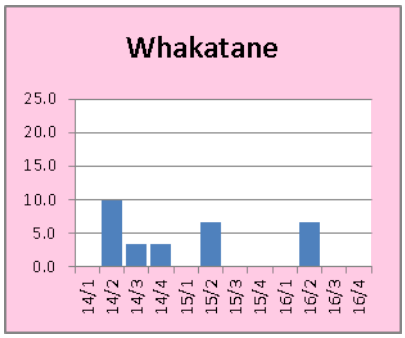


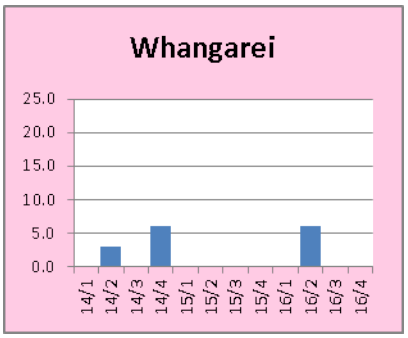


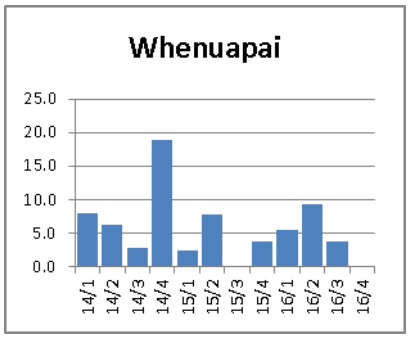


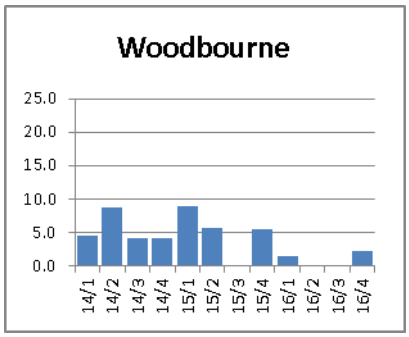








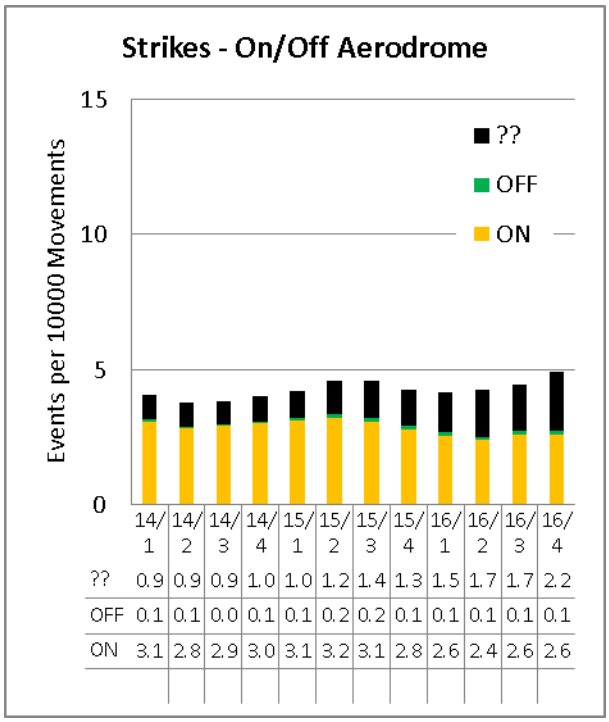




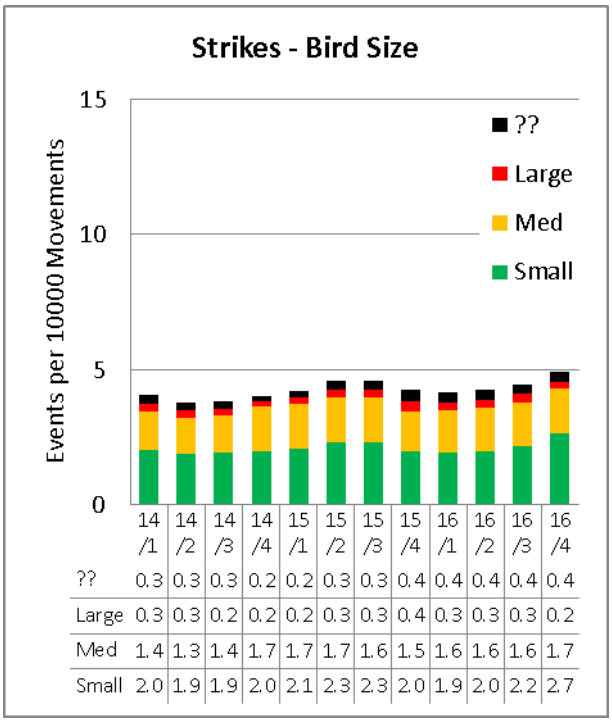
The remainder of this report records the results of analysis of individual aerodromes' reported bird strikes and near strikes broken down by on-/off-aerodrome and separately by bird size. One page is also included to cover the same information averaged across all monitored aerodromes.

The version of the report distributed internally within the CAA includes a separate page for each monitored aerodrome but the version delivered to each aerodrome operator carries only the pages relevant to that operator. The version delivered to the NZAFSC and DOC carries none of these individual pages.

Strike Rates per 10000 Movements - All Monitored Aerodromes (12 month moving averages)

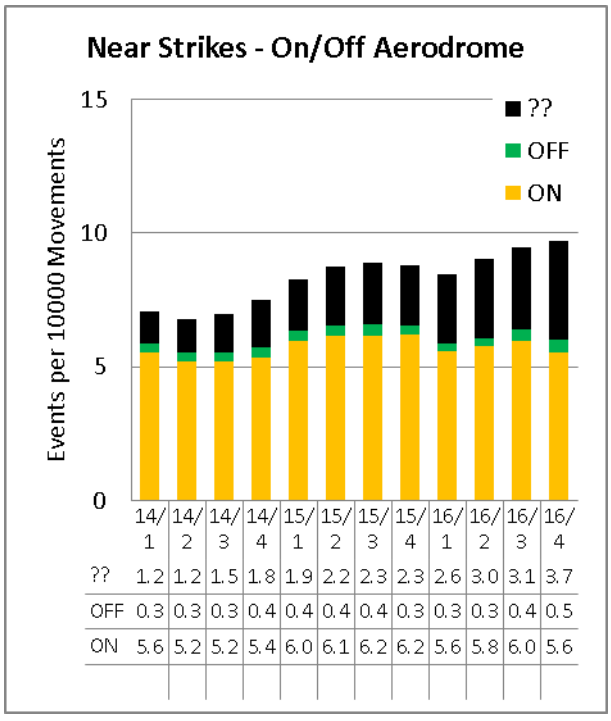


	14/1	14/2	14/3	14/4	15/1	15/2	15/3	15/4	16/1	16/2	16/3	16/4
??	0.9	0.9	0.9	1.0	1.0	1.2	1.4	1.3	1.5	1.7	1.7	2.2
OFF	0.1	0.1	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1
ON	3.1	2.8	2.9	3.0	3.1	3.2	3.1	2.8	2.6	2.4	2.6	2.6

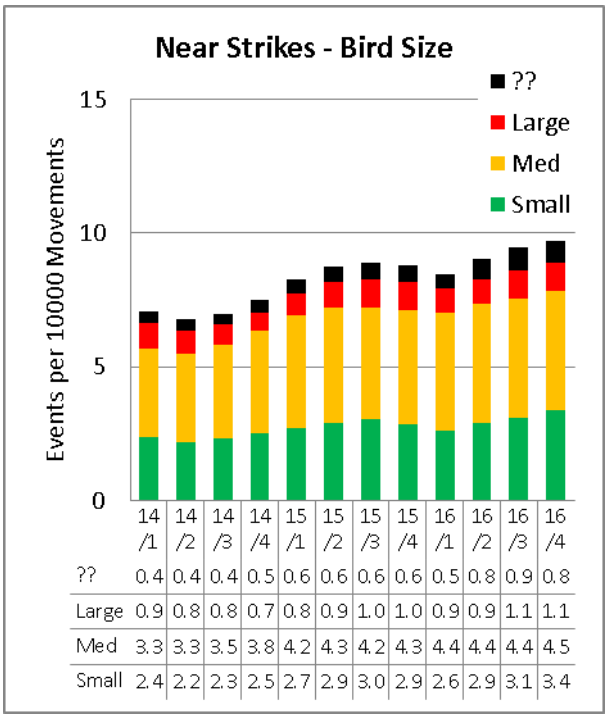


	14/1	14/2	14/3	14/4	15/1	15/2	15/3	15/4	16/1	16/2	16/3	16/4
??	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4
Large	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.3	0.2
Med	1.4	1.3	1.4	1.7	1.7	1.7	1.6	1.5	1.6	1.6	1.6	1.7
Small	2.0	1.9	1.9	2.0	2.1	2.3	2.3	2.0	1.9	2.0	2.2	2.7

Near Strike Rates per 10000 Movements - All Monitored Aerodromes (12 month moving averages)



	14/1	14/2	14/3	14/4	15/1	15/2	15/3	15/4	16/1	16/2	16/3	16/4
??	1.2	1.2	1.5	1.8	1.9	2.2	2.3	2.3	2.6	3.0	3.1	3.7
OFF	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.5
ON	5.6	5.2	5.2	5.4	6.0	6.1	6.2	6.2	5.6	5.8	6.0	5.6



	14/1	14/2	14/3	14/4	15/1	15/2	15/3	15/4	16/1	16/2	16/3	16/4
??	0.4	0.4	0.4	0.5	0.6	0.6	0.6	0.6	0.5	0.8	0.9	0.8
Large	0.9	0.8	0.8	0.7	0.8	0.9	1.0	1.0	0.9	0.9	1.1	1.1
Med	3.3	3.3	3.5	3.8	4.2	4.3	4.2	4.3	4.4	4.4	4.4	4.5
Small	2.4	2.2	2.3	2.5	2.7	2.9	3.0	2.9	2.6	2.9	3.1	3.4