

Supplementary Material

Appendix S1. Table of information for weather stations used in sample day selection across the Aorangi 2014, Aorangi 2017 and Southern Remutaka 2017 operations monitored. NIWA and GWRC station data were sourced from <https://cliflo.niwa.co.nz/> and <http://graphs.gw.govt.nz/> respectively.

Station Name	Source	Agent Number	Operation used	Data	Latitude (dec. deg.)	Longitude (dec. deg.)
Martinborough Ews	NIWA	(21938)	Aorangi 2014	Mean wind speed (km h ⁻¹ , 24 h); Max wind gust (km h ⁻¹ , 24 h)	-41.25231	175.38985
Wallaceville Ews	NIWA	(17029)	Aorangi 2014	Mean wind speed (km h ⁻¹ , 24 h); Max wind gust (km h ⁻¹ , 24 h); Cumulative rainfall (mm, 24h)	-41.1354	175.05275
Masterton Aero Aws	NIWA	(36735)	Aorangi 2014	Max wind gust (km h ⁻¹ , 24 h); Cumulative rainfall (mm, 24 h)	-40.975	175.638
Lake Kohangatera	GWRC	NA	Aorangi 2017 Remutaka 2017	Cumulative rainfall (mm, 0800–0900 h NZST)	Unavailable	Unavailable
Wainuiomata River at Wainui Reservoir	GWRC	NA	Aorangi 2017 Remutaka 2017	Cumulative rainfall (mm, 0800–0900 h NZST)	Unavailable	Unavailable
Orongorongo River at Orongo Swamp	GWRC	NA	Aorangi 2017 Remutaka 2017	Cumulative rainfall (mm, 0800–0900 h NZST)	Unavailable	Unavailable
Waiorongomai at Matthews	GWRC	NA	Aorangi 2017 Remutaka 2017	Cumulative rainfall (mm, 0800–0900 h NZST)	Unavailable	Unavailable
Ruakokopatuna at Iraia	GWRC	NA	Aorangi 2017 Remutaka 2017	Cumulative rainfall (mm, 0800–0900 h NZST)	Unavailable	Unavailable
Wainuiomata at Bowling AQ	GWRC	NA	Aorangi 2017 Remutaka 2017	Windspeed at 10 m (km h ⁻¹ , 0800 h NZST)	Unavailable	Unavailable
Lake Onoke at Lake Ferry	GWRC	NA	Aorangi 2017 Remutaka 2017	Windspeed at 5 m (km h ⁻¹ , 0800 h NZST)	Unavailable	Unavailable
Lake Wairarapa at Barrage North	GWRC	NA	Aorangi 2017 Remutaka 2017	Windspeed at 6 m (km h ⁻¹ , 0800 h NZST)	Unavailable	Unavailable
Met Station at Lake Wairarapa East	GWRC	NA	Aorangi 2017 Remutaka 2017	Windspeed at 2.5 m (km h ⁻¹ , 0800 h NZST)	Unavailable	Unavailable
Met Station at Lake Wairarapa West	GWRC	NA	Aorangi 2017 Remutaka 2017	Windspeed at 2.5 m (km h ⁻¹ , 0800 h NZST)	Unavailable	Unavailable

Appendix S5. Summary statistics of raw API data for the species monitored across the Aorangi 2014 operation in treatment and non-treatment^(†) areas. Bold font highlights native species monitored.

Common/Māori name	Species name	Mean	Median	Interquartile Range	Min–Max
Bellbird/Korimako	<i>Anthornis melanura</i>	Monitored as Bellbird/ Tūi	Monitored as Bellbird/ Tūi	Monitored as Bellbird/ Tūi	Monitored as Bellbird/ Tūi
Chaffinch	<i>Fringilla coelebs</i>	0.154 0.023 [†]	0.033 0.000 [†]	0.000–0.225 0.000–0.000 [†]	0.000–0.833 0.000–0.567 [†]
Dunnock	<i>Prunella modularis</i>	0.007 0.002 [†]	0.000 0.000 [†]	0.000–0.000 0.000–0.000 [†]	0.000–0.200 0.000–0.100 [†]
Eastern Rosella	<i>Platycercus eximius</i>	0.006 0.000 [†]	0.000 0.000 [†]	0.000–0.000 0.000–0.000 [†]	0.000–0.333 0.000–0.000 [†]
New Zealand Falcon/Kārearea	<i>Falco novaeseelandiae</i>	0.000 0.000 [†]	0.000 0.000 [†]	0.000–0.000 0.000–0.000 [†]	0.000–0.000 0.000–0.000 [†]
Fantail/Pīwakawaka	<i>Rhipidura fuliginosa</i>	0.048 0.007 [†]	0.000 0.000 [†]	0.000–0.067 0.000–0.000 [†]	0.000–0.400 0.000–0.300 [†]
Grey warbler/Riroriro	<i>Gerygone igata</i>	0.122 0.037 [†]	0.067 0.000 [†]	0.000–0.158 0.000–0.067 [†]	0.000–0.933 0.000–0.500 [†]
Kākā	<i>Nestor meridionalis</i>	0.000 0.001 [†]	0.000 0.000 [†]	0.000–0.000 0.000–0.000 [†]	0.000–0.000 0.000–0.067 [†]
Red-crowned Parakeet/Kākāriki	<i>Cyanoramphus novaezelandiae</i>	0.000 0.002 [†]	0.000 0.000 [†]	0.000–0.000 0.000–0.000 [†]	0.000–0.000 0.000–0.033 [†]
Long-tailed Cuckoo/Koekoē	<i>Eudynamys taitensis</i>	0.000 0.000 [†]	0.000 0.000 [†]	0.000–0.000 0.000–0.000 [†]	0.000–0.000 0.000–0.000 [†]
Rifleman/Titipounamu	<i>Acanthisitta chloris</i>	0.012 0.026 [†]	0.000 0.000 [†]	0.000–0.000 0.000–0.000 [†]	0.000–0.500 0.000–0.400 [†]
Shining Cuckoo/Pipīwharau	<i>Chrysococcyx lucidus</i>	0.000 0.000 [†]	0.000 0.000 [†]	0.000–0.000 0.000–0.000 [†]	0.000–0.000 0.000–0.000 [†]
Silvereye/Tauhō	<i>Zosterops lateralis</i>	0.143 0.036 [†]	0.067 0.000 [†]	0.000–0.233 0.000–0.067 [†]	0.000–0.833 0.000–0.400 [†]
North Island Tomtit/Miromiro	<i>Petroica macrocephala toitoi</i>	0.133 0.098 [†]	0.017 0.000 [†]	0.000–0.200 0.000–0.100 [†]	0.000–0.733 0.000–0.767 [†]
Tūi	<i>Prothemadera novaeseelandiae</i>	Monitored as Bellbird/Tūi	Monitored as Bellbird/Tūi	Monitored as Bellbird/Tūi	Monitored as Bellbird/Tūi
Whitehead/Pōpokatea	<i>Mohoua albicilla</i>	0.110 0.052 [†]	0.000 0.000 [†]	0.000–0.158 0.000–0.000 [†]	0.000–0.867 0.000–0.767 [†]
New Zealand Woodpigeon/Kererū	<i>Hemiphaga novaeseelandiae</i>	0.007 0.004 [†]	0.000 0.000 [†]	0.000–0.000 0.000–0.000 [†]	0.000–0.133 0.000–0.067 [†]
Bellbird/Tūi	<i>Anthornis melanura/</i> <i>Prothemadera novaeseelandiae</i>	0.138 0.129 [†]	0.067 0.050 [†]	0.000–0.200 0.000–0.175 [†]	0.000–0.767 0.000–0.800 [†]
Blackbird/Song Thrush	<i>Turdus merula/</i> <i>Turdus philomelos</i>	0.246 0.143 [†]	0.067 0.000 [†]	0.000–0.500 0.000–0.133 [†]	0.000–1.000 0.000–1.000 [†]

Appendix S6. Summary statistics of raw API data for the species monitored across the Aorangi 2017 operation in treatment and non-treatment^(†) areas. Bold font highlights native species monitored.

Common/Māori name	Species name	Mean	Median	Interquartile Range	Min–Max
Bellbird/Korimako	<i>Anthornis melanura</i>	0.092 0.049 [†]	0.067 0.000 [†]	0.000–0.133 0.000–0.067 [†]	0.000–0.500 0.000–0.533 [†]
Chaffinch	<i>Fringilla coelebs</i>	0.111 0.064 [†]	0.100 0.033 [†]	0.033–0.167 0.000–0.100 [†]	0.000–0.433 0.000–0.467 [†]
Dunnock	<i>Prunella modularis</i>	0.006 0.009 [†]	0.000 0.000 [†]	0.000–0.000 0.000–0.000 [†]	0.000–0.233 0.000–0.267 [†]
Eastern Rosella	<i>Platycercus eximius</i>	0.009 0.005 [†]	0.000 0.000 [†]	0.000–0.000 0.000–0.000 [†]	0.000–0.300 0.000–0.267 [†]
New Zealand Falcon/Kārearea	<i>Falco novaeseelandiae</i>	0.001 0.001 [†]	0.000 0.000 [†]	0.000–0.000 0.000–0.000 [†]	0.000–0.100 0.000–0.033 [†]
Fantail/Pīwakawaka	<i>Rhipidura fuliginosa</i>	0.073 0.141 [†]	0.000 0.033 [†]	0.000–0.067 0.000–0.233 [†]	0.000–0.967 0.000–0.833 [†]
Grey warbler/Riroriro	<i>Gerygone igata</i>	0.087 0.057 [†]	0.067 0.033 [†]	0.000–0.133 0.000–0.067 [†]	0.000–0.500 0.000–0.433 [†]
Kākā	<i>Nestor meridionalis</i>	0.002 0.000 [†]	0.000 0.000 [†]	0.000–0.000 0.000–0.000 [†]	0.000–0.167 0.000–0.033 [†]
Red-crowned Parakeet/Kākāriki	<i>Cyanoramphus novaeseelandiae</i>	0.001 0.005 [†]	0.000 0.000 [†]	0.000–0.000 0.000–0.000 [†]	0.000–0.067 0.000–0.200 [†]
Long-tailed Cuckoo/Koekoē	<i>Eudynamys taitensis</i>	0.000 0.000 [†]	0.000 0.000 [†]	0.000–0.000 0.000–0.000 [†]	0.000–0.033 0.000–0.033 [†]
Rifleman/Titipounamu	<i>Acanthisitta chloris</i>	0.030 0.046 [†]	0.000 0.000 [†]	0.000–0.033 0.000–0.033 [†]	0.000–0.333 0.000–0.533 [†]
Shining Cuckoo/Pipīwharau	<i>Chrysococcyx lucidus</i>	0.003 0.001 [†]	0.000 0.000 [†]	0.000–0.000 0.000–0.000 [†]	0.000–0.167 0.000–0.033 [†]
Silvereye/Tauhou	<i>Zosterops lateralis</i>	0.568 0.430 [†]	0.600 0.433 [†]	0.367–0.733 0.200–0.633 [†]	0.033–1.000 0.000–1.000 [†]
North Island Tomtit/Miromiro	<i>Petroica macrocephala toitoi</i>	0.196 0.172 [†]	0.133 0.100 [†]	0.033–0.267 0.033–0.258 [†]	0.000–0.933 0.000–0.833 [†]
Tūi	<i>Prothemadera novaeseelandiae</i>	0.050 0.171 [†]	0.000 0.067 [†]	0.000–0.067 0.000–0.267 [†]	0.000–0.733 0.000–1.000 [†]
Whitehead/Pōpokatea	<i>Mohoua albicilla</i>	0.128 0.008 [†]	0.000 0.000 [†]	0.000–0.167 0.000–0.000 [†]	0.000–0.867 0.000–0.367 [†]
New Zealand Woodpigeon/Kererū	<i>Hemiphaga novaeseelandiae</i>	0.021 0.009 [†]	0.000 0.000 [†]	0.000–0.033 0.000–0.000 [†]	0.000–0.267 0.000–0.100 [†]
Bellbird/Tūi	<i>Anthornis melanura/</i> <i>Prothemadera novaeseelandiae</i>	0.352 0.319 [†]	0.333 0.267 [†]	0.142–0.525 0.100–0.500 [†]	0.000–0.967 0.000–0.900 [†]
Blackbird/Song Thrush	<i>Turdus merula/</i> <i>Turdus philomelos</i>	0.537 0.593 [†]	0.600 0.683 [†]	0.167–0.892 0.267–1.000 [†]	0.000–1.000 0.000–1.000 [†]

Appendix S7. Summary statistics of raw API data for the species monitored across the Southern Remutaka 2017 operation in treatment and non-treatment^(†) areas. Bold font highlights native species monitored.

Common/Māori name	Species name	Mean	Median	Interquartile Range	Min–Max
Bellbird/Korimako	<i>Anthornis melanura</i>	0.012 0.026 [†]	0.000 0.000 [†]	0.000–0.000 0.000–0.000 [†]	0.000–0.167 0.000–0.667 [†]
Chaffinch	<i>Fringilla coelebs</i>	0.009 0.061 [†]	0.000 0.000 [†]	0.000–0.000 0.000–0.100 [†]	0.000–0.100 0.000–0.667 [†]
Dunnock	<i>Prunella modularis</i>	0.000 0.022 [†]	0.000 0.000 [†]	0.000–0.000 0.000–0.000 [†]	0.000–0.000 0.000–0.433 [†]
Eastern Rosella	<i>Platycercus eximius</i>	0.000 0.002 [†]	0.000 0.000 [†]	0.000–0.000 0.000–0.000 [†]	0.000–0.000 0.000–0.067 [†]
New Zealand Falcon/Kārearea	<i>Falco novaeseelandiae</i>	0.000 0.001 [†]	0.000 0.000 [†]	0.000–0.000 0.000–0.000 [†]	0.000–0.000 0.000–0.033 [†]
Fantail/Pīwakawaka	<i>Rhipidura fuliginosa</i>	0.003 0.135 [†]	0.000 0.067 [†]	0.000–0.000 0.000–0.200 [†]	0.000–0.133 0.000–0.667 [†]
Grey warbler/Riroriro	<i>Gerygone igata</i>	0.072 0.118 [†]	0.033 0.100 [†]	0.000–0.100 0.033–0.167 [†]	0.000–0.500 0.000–0.633 [†]
Kākā	<i>Nestor meridionalis</i>	0.000 0.000 [†]	0.000 0.000 [†]	0.000–0.000 0.000–0.000 [†]	0.000–0.000 0.000–0.000 [†]
Red-crowned Parakeet/Kākāriki	<i>Cyanoramphus novaeseelandiae</i>	0.007 0.004 [†]	0.000 0.000 [†]	0.000–0.000 0.000–0.000 [†]	0.000–0.067 0.000–0.200 [†]
Long-tailed Cuckoo/Koekoē	<i>Eudynamis taitensis</i>	0.000 0.000 [†]	0.000 0.000 [†]	0.000–0.000 0.000–0.000 [†]	0.000–0.000 0.000–0.033 [†]
Rifleman/Tītipounamu	<i>Acanthisitta chloris</i>	0.088 0.043 [†]	0.067 0.000 [†]	0.000–0.125 0.000–0.033 [†]	0.000–0.400 0.000–0.600 [†]
Shining Cuckoo/Pīpīwharau	<i>Chrysococcyx lucidus</i>	0.000 0.001 [†]	0.000 0.000 [†]	0.000–0.000 0.000–0.000 [†]	0.000–0.000 0.000–0.033 [†]
Silvereye/Tauhou	<i>Zosterops lateralis</i>	0.075 0.295 [†]	0.033 0.200 [†]	0.000–0.125 0.067–0.500 [†]	0.000–0.300 0.000–0.900 [†]
North Island Tomtit/Miromiro	<i>Petroica macrocephala toitoi</i>	0.326 0.206 [†]	0.300 0.100 [†]	0.100–0.508 0.000–0.300 [†]	0.000–0.967 0.000–1.000 [†]
Tūi	<i>Prothemadera novaeseelandiae</i>	0.005 0.061 [†]	0.000 0.000 [†]	0.000–0.000 0.000–0.033 [†]	0.000–0.133 0.000–0.933 [†]
Whitehead/Pōpokatea	<i>Mohoua albicilla</i>	0.029 0.005 [†]	0.000 0.000 [†]	0.000–0.000 0.000–0.000 [†]	0.000–0.400 0.000–0.167 [†]
New Zealand Woodpigeon/Kererū	<i>Hemiphaga novaeseelandiae</i>	0.002 0.007 [†]	0.000 0.000 [†]	0.000–0.000 0.000–0.000 [†]	0.000–0.033 0.000–0.100 [†]
Bellbird/Tūi	<i>Anthornis melanura</i> / <i>Prothemadera novaeseelandiae</i>	0.036 0.165 [†]	0.000 0.067 [†]	0.000–0.033 0.000–0.233 [†]	0.000–0.267 0.000–0.900 [†]
Blackbird/Song Thrush	<i>Turdus merula</i> / <i>Turdus philomelos</i>	0.268 0.442 [†]	0.100 0.367 [†]	0.000–0.500 0.067–0.767 [†]	0.000–1.000 0.000–1.000 [†]