



# Kiwi Coast Kiwi Listening Blitz #2

2020-2021



Dr Karen Verdurmen and Ngaire Sullivan, March 2021

## Introduction

The vision of Kiwi Coast is one of thriving wild kiwi, safely roaming throughout Northland, nurtured and cared for by Northlanders.

Kiwi Coast is a community-led collaborative initiative linking conservation projects, iwi and hapū, landowners, farmers, forest management companies, government agencies and schools in the shared vision of increasing kiwi numbers, creating safe ecological corridors and improving the general biodiversity values of Northland.

Kiwi Coast operates at a landscape scale, linking projects over 291km from Mangawhai at the southern limit of the Northland region to the Aupouri peninsula in the Far North. As of June 2020, over 170 entities have linked into the Kiwi Coast, 164 of which are community-led projects, collectively managing over 205,000 hectares. Kiwi Coast strategically supports predator control in key areas to link projects and create continuous trapping networks across the landscape that boost kiwi survival and allow their safe dispersal into new areas via 'kiwi corridors' (Kiwi Coast Strategic Plan, 2017).

Northland brown kiwi are found in many parts of the Kiwi Coast, at varying population densities. The need for kiwi corridors in Northland was identified in 2006 by Pierce et al. who stated that kiwi corridors were an *"urgent requirement because it is particularly important to ensure that locally viable populations of kiwi are retained in Northland."* The establishment of corridors between managed sites of Northland brown kiwi was also identified as a high priority in the Taxon Plan for Northland brown kiwi as per Objectives 6.4, 7.1, 8.2. (Craig et al., 2011).

Through supporting and linking predator control networks to create thriving kiwi corridors across Northland, Kiwi Coast aims to secure a genetically viable Northland brown kiwi population to ensure that this iconic tāonga species is here for generations to come.

## Kiwi Listening Blitz Surveys

Kiwi Coast's long-term 'Kiwi Monitoring Plan' is based on best practice kiwi monitoring protocols developed by the Department of Conservation such as the Northland Annual Kiwi Call Count Survey, as well as the use of Kiwi Listening Devices and five-yearly Kiwi Listening Blitz Surveys (Topia, 2014).

Kiwi Listening Blitz Surveys are designed to track changes in the Northland brown kiwi population and distribution within the Kiwi Coast collective project area over time, with the expectation that kiwi numbers will increase and expand into new areas in response to sustained pest control and improved dog control.

Kiwi Listening Blitz's are a key outcome monitoring tool for the Kiwi Coast. Upon five-yearly repetition, the data may show changes in kiwi distribution as kiwi populations expand and kiwi return to areas where they have currently diminished to undetectable densities or are absent.

## Kiwi Listening Blitz #2

Kiwi Coast Listening Blitz Surveys are conducted using kiwi listening devices (KLDs), or passive acoustic recording devices.

The first Kiwi Listening Blitz was carried out in 2016. The second Kiwi Listening Blitz (KLB#2) was carried out during 2020-2021. Fieldwork for KLB#2 was led by Dr Karen Verdurmen with early assistance from NorthTec Conservation Management Students.

### Survey Sites

Prior to each survey, Kiwi Coast worked with kiwi practitioners, DOC and the Northland Regional Council to prepare a pre-survey map to assist with targeting sites and fieldwork planning. Kiwi Listening Blitz survey sites were selected according to habitat, land use, ownership, ease of access and to fill the gaps in knowledge of kiwi presence in Northland. Existing human kiwi listening stations that are monitored as part of the annual Northland Kiwi Call Count Survey were excluded, as were areas defined by DOC as having high kiwi density (<http://www.doc.govt.nz/northlandbrownkiwi>) as these sites are already known to have kiwi present or not. Data are also collated from KLDs used in Northland within the previous 12 months to avoid unnecessary re-surveying of sites.

Using the pre-survey map, the number and placement of KLDs were then determined by a number of factors. Firstly, KLDs were placed at least 500m apart, at a maximum density of approximately two KLDs per 1 km<sup>2</sup>. This ensured reasonable coverage of the area of interest within logistical constraints and also prevented overlapping survey areas. The theoretical range of a KLD is approximately 1000m radius, but this is limited by any ridge or rise in the land. KLDs listen best into sites at the same, or lower, height level (\*1. I. Castro KLD research in Rawhiti, 2018).

Other factors that determined the placement of KLDs included accessibility (public land, or permission obtained from private landowners), and the availability of potentially suitable habitat.

Kiwi Listening Blitz#2 re-surveyed the 2016 sites, as well as an additional 170 sites to investigate the expanded Kiwi Coast project area of 205,000ha at the beginning of the fieldwork in 2020.

Five sites surveyed for KiwiBlitz#1, were not surveyed during KiwiBlitz#2. Three of these sites were identified as being in a High Kiwi Call area, for one site the location information was incorrect and could not be identified, another site had a change of landowner and new owners did not permit access.

GPS data from 2016 were used to ensure KLDs were placed at the same locations during KLB#2 as they had been for KLB#1. However, some changes had to be made to the exact location of the KLD within sites on some occasions. These occurred due to new Kauri Dieback Disease access restrictions, access restrictions due to change of ownership or dense vegetation regrowth preventing safe access to the site.

As the use of KLDs was relatively new in 2016, several areas were surveyed during the first Kiwi Listening Blitz by placing two KLDs on opposite sides of a high point or ridge. This was in order to

investigate if they picked up the same kiwi calls or whether the ridge top provided a sufficient barrier. As KLDs at these sites did record the same kiwi calls, they were moved further apart during KLB#2. This meant that during KiwiBlitz#1, 63 KLDs were deployed, but only listened into 48 sites. By moving KLDs further apart for KLB#2, the same overall areas were re-surveyed, but this time 58 KLDs listened into 58 sites, each with a greater probability of recording different kiwi.

In addition to the 2016 survey sites, KLB#2 included an additional 170 sites to take the total number of sites surveyed to 228. This increased number of survey sites reflects the increasing expansion of the collective Kiwi Coast project area as new groups start and further projects link in. While in 2016 the Kiwi Coast project area was 75,000ha, in 2020 it had expanded to 205,000ha. Further, the increased use of KLDs throughout Northland by DOC, NRC and other organisations meant that relevant data could be collated for sites surveyed within 12 months of KLB#2. This included KLDs used during the 2020 Northland Annual Kiwi Call Count Listening Survey, as well as those used during 2020-21 by Kiwi Coast, DOC, Fish and Game, Hancock Forestry Management and NRC.

### Survey Methods

KLB#2 repeated survey methods established during the first Kiwi Listening Blitz. These methods are based on DOC Best Practice KLD protocols and consistent with those established in Northland to reliably detect kiwi presence (P. Graham, Northland Regional Council, personal communication).

Each KLD was deployed for at least six hours per night for seven consecutive nights. Recording times varied through the seasons as surveys extended from dusk till dawn. This meant that in winter KLDs recorded up to 12 hours of data, while in summer the number of hours reduced to eight. Recording through the extended hours of darkness during winter, which coincides with the peak breeding season of Northland brown kiwi, ensured that nesting kiwi with reduced activity would still be detected.

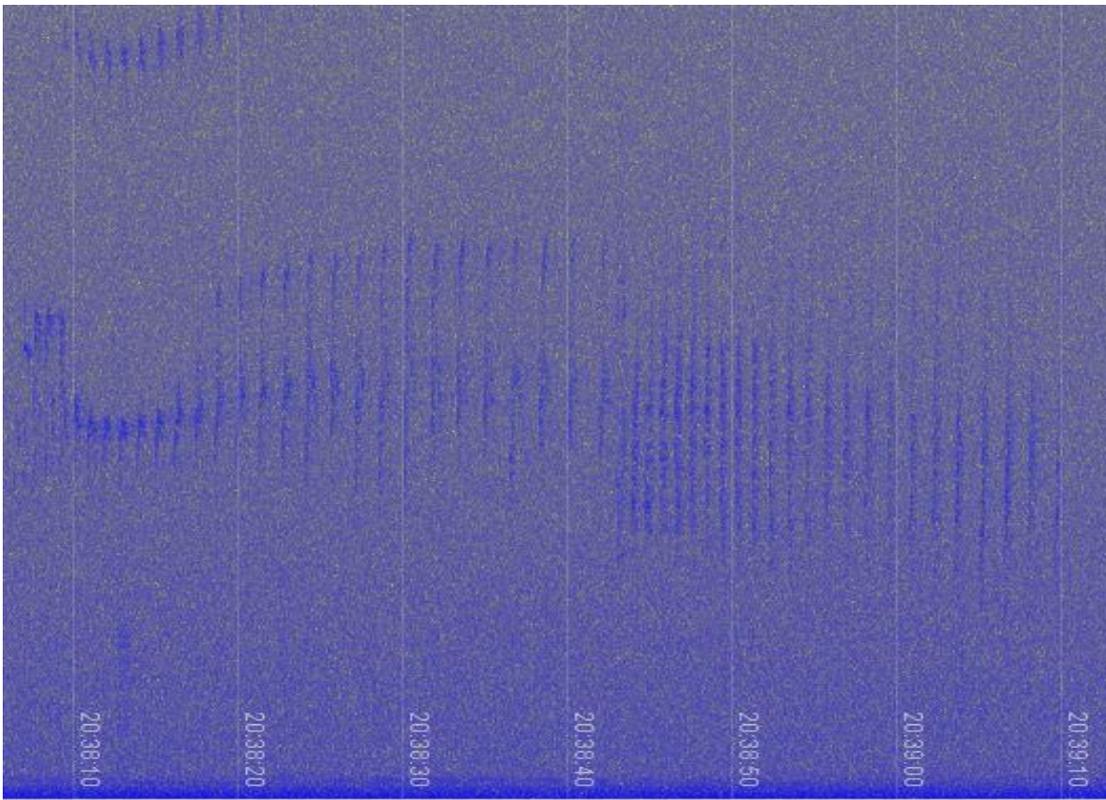
Each KLD was affixed to a narrow tree using a bungee cord, approximately just above head height (Figure 2). KLDs were placed in locations that maximised the area listened into and gave the best likelihood of recording kiwi calls clearly. To avoid excessive wind noise interference, KLDs were placed below peaks or ridges rather than at the top. Also, where possible, KLDs were not set out in the open. 'Noisy' vegetation was also avoided where possible, including poplars, pines, eucalyptus, lone tall trees, and pampas. Locations close to other noise-generating features such as ocean waves, waterfalls and waterways were also avoided as much as possible.



**Figure 2: KLD attached to narrow tree with bungee cord**

## Data Analysis

The software program Freebird was used to analyse KLD recordings and determine kiwi presence. Recordings were viewed as spectrograms (soundwave pictures). As kiwi calls have identifiable soundwave pictures, they are able to be distinguished from other night sounds and bird calls. In addition, male kiwi calls can be further distinguished from those made by females (Figure 3).



**Figure 3: Male followed by Female Kiwi Call.**

KiwiBlitz#2 analysis determined kiwi “presence” or “non-detection” at each site. Kiwi were regarded as “not-detected” at sites, rather than as being “absent” to allow for the possibility that kiwi may still have been present, but did not call or that calls were unable to be detected due to distance, background noise, interference or the analyser failing to detect a call.

All KLDs were analysed until the first point of kiwi detection, whether male or female. This means that the recorded time analysed varied from 15 minutes to the full seven nights.

In addition to the data analysis for KLB#2, further analysis was undertaken for sites managed by active Kiwi Coast groups or projects. For these sites, if kiwi were detected a Kiwi Call Log Table was created for five nights, showing dates and times of each kiwi call, along with whether the calls were male or female. These Kiwi Call Logs are not a part of this Kiwi Listening Blitz #2 Report, but were provided directly to the relevant community groups and landowners involved. For a number of groups this provided the first evidence of kiwi presence at their site.

## Results

Map 1 shows the results of the two Kiwi Coast Listening Blitz's in 2016 and 2020. The location of human Kiwi Listening Sites as well as high and low known kiwi density areas depicts the current known distribution of kiwi within the Kiwi Coast project area.

During the first Kiwi Listening Blitz in 2016, the Kiwi Coast collective project area was 75,000 hectares. Fifty-eight sites were surveyed, with kiwi detected at 65% of them.

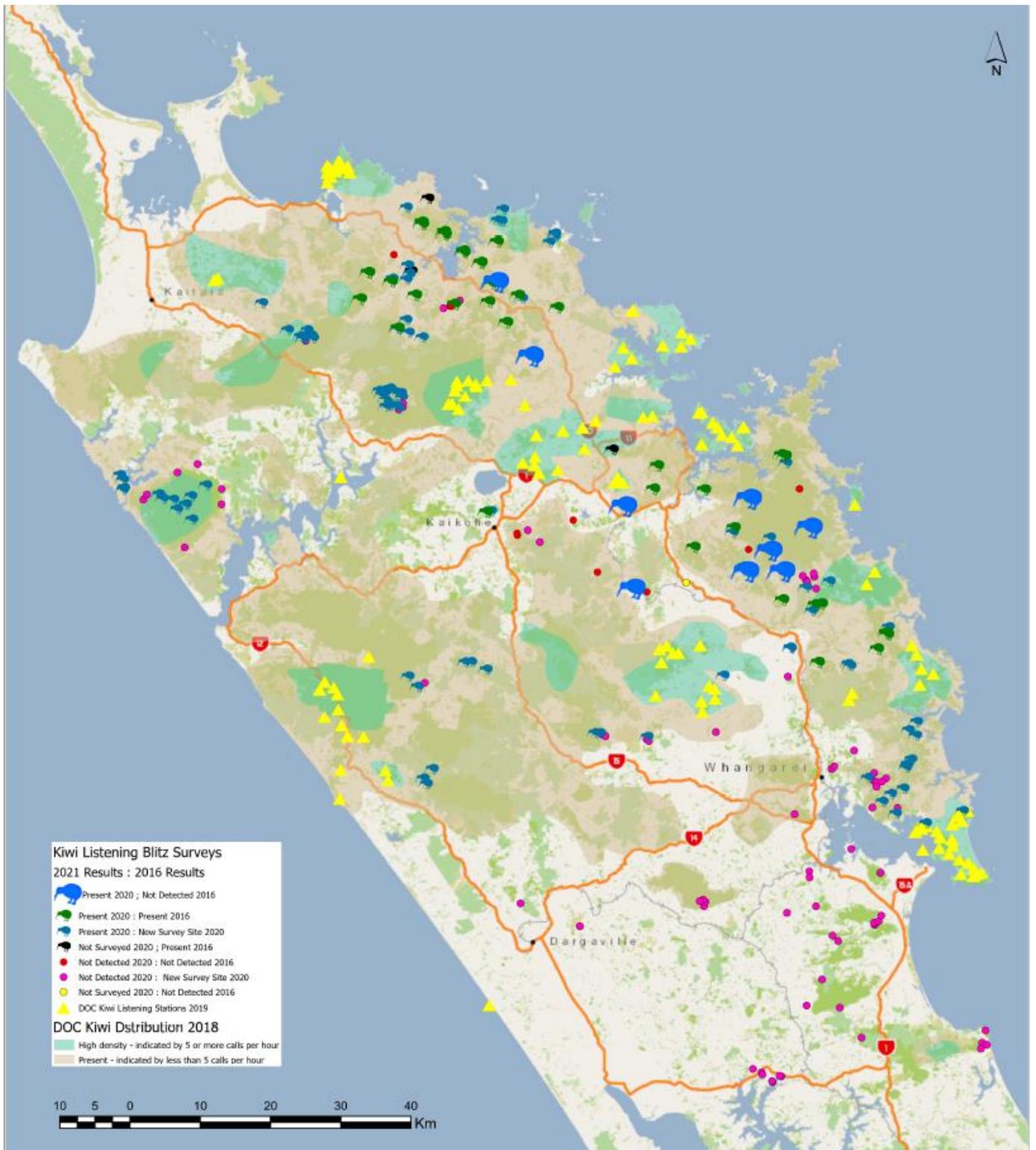
Kiwi Listening Blitz#2 re-surveyed the 2016 sites, as well as an additional 170 sites to investigate the expanded Kiwi Coast project area of 205,000ha.

A total of 228 sites were surveyed during Kiwi Listening Blitz #2. Kiwi were detected at 137 or 60% of the sites surveyed. All sites surveyed in 2016 that recorded kiwi, still had kiwi in 2021.

58 sites were re-surveyed from KiwiBlitz#1, 2016 (Table 1). 44 of these 58 sites recorded kiwi presence.

50% of sites that did not detect kiwi in 2016 were found to have kiwi in 2021.

171 new sites were surveyed in 2020-21. 93 of these new sites recorded kiwi presence (Table 2). Thirty-seven of the sites where kiwi were not detected occur south of Whangarei (South of SH14), between the coast and the Kaipara harbour. The absence of kiwi in this area had been noted by previous studies (For example, Miller and Pierce, 1995).



Map 1: Kiwi Listening Blitz Results 2016 & 2021. Map: A Duxfield

Table 1: Kiwi Listening Blitz #2 Results, 2020-2021, including 58 re-surveyed sites from Kiwi Listening Blitz #1, 2015-2016.

<b>Area</b>	<b>GPS Site Name</b>	<b>KLB#2 2020-21</b>	<b>KLBI#1 2016</b>
<b>Far North</b>			
Whangaroa	Whangaroa1	Present	Present
Whangaroa	Whangaroa2	Present	Present
Otangaroa	Tara	Not Detected	Not Detected
Otangaroa	Otangaroa1	Present	Present
Otangaroa	Otangaroa2	Present	Present
Otangaroa	Tarataracle	Present	Present
Pupuke	Coppermine2	Not Detected	Not Detected
Kaeo	WildKiwiGirls2 =Old Coppermine1	Present	Present
Pupuke	Te Ranga	Present	Present
Kaeo	Te Huia1	Present	Not Detected
Kaeo	Te Huia2	Present	Present
Totara North	Salvation1	Present	Present
Totara North	Salvation2	Present	Present
Totara North	Ranfurly1	Present	Present
Totara North	Ranfurly2	Present	Present
Kaeo	Topp	Present	Present
Pupuke	Takakuri	Present	Present
Whangaroa	Bennett	Present	Present
Whangaroa	Bennett2	Present	Present
Matangirau	Rush	Present	Present
<b>Mid North</b>			
Motatou	Wetland	Present	Not Detected
Moerewa	Moerewa	Present	Not Detected
Pakaraka	Jack	Not Detected	Not Detected

Ngawha	Cumbertrig	Not Detected	Not Detected
Ngawha	Cumbertrig2	Not Detected	Not Detected
Kaikohe	Reservoir1	Present	Present
Otao-Opua	Opua	Present	Present
Whangae	Whangae	Present	Present
Orotere	Taraire	Present	Present
Takou Bay	Takou	Present	Present
Waiare	Waiare	Present	Present
Pungaere	Pungaere	Present	Not Detected

**Whangarei+West+Russell**

Hikurangi	Gomez	Present	Present
Whakapara	Otonga	Not Detected	Not Detected
Whananaki	Hailes1	Present	Present
Whananaki	Hailes2	Present	Present
Ngaiotonga	Ngaio1	Present	Present
Ngaiotonga	Ngaio2	Present	Present
Kaimamaku	Kaimamaku1	Present	Present
Kaimamaku	Kaimamaku2	Present	Present
Tapuhi	Waiotu1	Present	Not Detected
Tapuhi	Waiotu2	Not Detected	Not Detected
Tapuhi	Tahiwi1	Present	Not Detected
Tapuhi	Tahiwi2	Not Detected	Not Detected
Tapuhi	NelsonRd	Not Detected	Not Detected
Kawakawa	Pakaru1	Present	Present
Puhipuhi	Mine Rd	Present	Present
Puhipuhi	Mine RdUpper	Present	Not Detected
Karetu	Waikino	Present	Present
Motatou	Motatou	Not Detected	Not Detected
Pokapu	Pokapu	Not Detected	Not Detected

Whangaruru	Papakauri	Not Detected	Not Detected
Whangaruru	Papakauri2	Not Detected	Not Detected
Punaruks	Punaruks1	Present	Not Detected
Punaruks	Punaruks2	Not Detected	Not Detected
Karetu	Waikare	Present	Not Detected
Ruapekapeka	Ruapeka	Present	Present
Marua-Whananaki	Waipipi	Present	Present

Table 2: Kiwi Listening Blitz #2 Results, 2020-2021: 170 new sites, 93 with kiwi present.

<b>Area</b>	<b>GPS Site Name</b>	<b>Present/ Not Detected</b>
<b>Far North</b>		
Kaeo	WildKiwiGirls1	Not Detected
Pupuke	Coppermine1	Not Detected
Pupuke	Coppermine3	Not Detected
Pupuke	Te Ranga2	Present
Pupuke	Te Ranga3	Present
Pupuke	Takakuri2	Present
Pupuke	Takakuri3	Present
Otangaroa	Otangaroa3	Present
Otangaroa	Otangaroa4	Present
Otangaroa	Stevoscle	Present
Otangaroa	Danscle	Present
Otangaroa	Clecle	Present
Matauri Bay	Lonsdale	Present
Matauri Bay	MataurBF1	Present
Matauri Bay	MatauriBF2	Present
Matauri Bay	MatauriBF3	Present
Taemaro	Cemetery	Present
Mahinepua	Mahinepua1	Present

Mahinepua	Mahinepua2	Present
Mahinepua	Mahinepua3	Present
Warawara	WaraDoC1	Not Detected
Warawara	WaraDoC2	Present
Warawara	WaraDoC3	Present
Warawara	WaraDoC4	Present
Warawara	WaraDoC5	Present
Warawara	Dariusz1	Present
Warawara	Dariusz2	Present
Warawara	Dariusz3	Present
Warawara	Dariusz4	Present
Warawara	Dariusz5	Present
Warawara	Dariusz6	Present
Warawara	WaraNRC1	Not Detected
Warawara	WaraNRC2	Not Detected
Warawara	WaraNRC3	Not Detected
Warawara	WaraNRC4	Not Detected
Warawara	WaraNRC5	Not Detected
Warawara	WaraNRC6	Not Detected
Whangape	WaraNRC7	Present
Whangape	WaraNRC8	Present
Whangape	WaraNRC9	Present
Whangape	WaraNRC10	Present
Honeymoon Valley	Honey1	Present
Honeymoon Valley	Honey2	Present
Honeymoon Valley	Honey3	Present
Honeymoon Valley	Honey5	Present
Honeymoon Valley	Honey7	Not Detected
Honeymoon Valley	Honey8	Present

Honeymoon Valley	Honey9	Present
Honeymoon Valley	Honey10	Present
Honeymoon Valley	HoneyPuhoi	Present
Fairburn	Kaiaka	Present
Taupo Bay	Erica	Present
Omahuta Forest	1	Present
Omahuta Forest	9	Present
Omahuta Forest	8	Present
Omahuta Forest	4	Not Detected
Omahuta Forest	7	Present
Omahuta Forest	5	Present
Omahuta Forest	3	Not Detected
Omahuta Forest	15	Present
Omahuta Forest	2	Not Detected
Omahuta Forest	6	Present
Omahuta Forest	10	Present
Omahuta Forest	11	Present
Omahuta Forest	12	Present
Omahuta Forest	13	Present
Omahuta Forest	14	Present

**Mid North**

Ngawha	Ngawha1	Not Detected
Ngawha	Ngawha2	Not Detected
Kaikohe	Reservoir2	Present

**Whangarei+West+Russel**

Whakapara	Corbett	Present
Whakapara	Corbett2	Present

Whananaki	Hailes3	Present
Ngaiotonga	Ngaiotonga3	Present
Kaimamaku	Mick	Present
Kaimamaku	Geoff	Present
Tapuhi	Mandeno	Present
Tapuhi	Tahiwi3	Present
Kawakawa	Pakaru2	Present
Whakapara	Peach	Not Detected
Whakapara	Peach2	Not Detected
Whakapara	Foote1	Not Detected
Kaimamaku	Foote2	Not Detected
Huruiki	Foote3	Not Detected
TeaTree Flat-PuhiPuhi	Murray	Not Detected
Whakapara	Pablo	Present
Parihaka	Pari1	Not Detected
Parihaka	Pari2	Not Detected
Riponui	Otakairangi	Present
Ruatangata	Colymbrosa	Not Detected
Titoki	WUH1	Not Detected
Titoki	WUH2	Not Detected
Titoki	WUH3	Present
Tangowahine	Drinnon1	Not Detected
Tangowahine	Drinnon2	Present
Tangowahine	Drinnon3	Present
Tangowahine	Drinnon4	Not Detected
Tangihua	Tangihua1	Not Detected
Tangihua	Tangihua2	Not Detected
Tangihua	Tangihua3	Not Detected
Tangihua	Tangihua4	Not Detected

Dargaville	HoangaUnderwood	Not Detected
Dargaville	WaihueFlaxmillWetland	Not Detected
Hikurangi	Lowe1	Present
Hikurangi	Lowe2	Present
Hikurangi	Hikurangi1	Not Detected
Waipunga Forest	Rhine	Present
Waipunga Forest	Volga	Not Detected
Waipunga Forest	Volga Bush	Present
Owhiwa	Peterson	Present
Owhiwa	Mullooly	Present
Owhiwa	SimonCraig	Not Detected
Owhiwa	BobAndCarol	Present
Parua Bay	BarryJoblin	Not Detected
Parua Bay	PepiRd	Present
Taraunui	Le Shultz	Present
Taheke	Saparelli	Present
Waikaraka	Waikaraka	Not Detected
Kauri Mt	KauriMt3	Present
Nook	Nook1	Present
Mt Tiger Forest	MtTigerForestNRC	Present
Mt Tiger	RobAndRosie	Not Detected
Whareora	MSR1	Not Detected
Whareora	MSR2 RegAndKahu	Not Detected
Whareora	MSR3 AboveHomeStream	Not Detected
Whareora	HolwellRidge	Not Detected
Gammons Forest	Lotus	Present
Gammons Forest	Henley	Present
Gammons Forest	Lupin	Present
Whatoro Forest	Hayward	Present

Whatoro Forest	Cook	Present
Whatoro Forest	Ruapehu	Present
Whanui Forest	Mussel	Present
Whanui Forest	Oyster	Present
Whanui Forest	Toheroa	Present
Ngunguru Ford	SteveMcQuids	Present
Ngunguru Ford	RobbiesDriveway	Present
Harris Rd	HarrisRd	Not Detected

### **South**

Mangapai	Mangapaicaves1	Not Detected
Waipu	Waipucave1	Not Detected
Waipu	Waipucave2	Not Detected
Maretu	Millbrook	Not Detected
Maretu	FinlaysonBrook	Not Detected
Piroa Falls	Piroa	Not Detected
Taipuha	Cross	Not Detected
Bream Tail Farm	Breamtail1	Not Detected
Bream Tail Farm	Breamtail2	Not Detected
Bream Tail Farm	Breamtail3	Not Detected
Bream Tail Farm	Breamtail4	Not Detected
Otaika	Otaika1	Not Detected
Otaika	Otaika2	Not Detected
Wilson Dam	Wilsondam	Not Detected
Wilson Dam	Wilsondam2	Not Detected
Wilson Dam	Prescot1	Not Detected
Wilson Dam	Prescot2	Not Detected
Wilson Dam	Prescot3	Not Detected
Oakleigh	McCullough	Not Detected

Oakleigh	Ruarangi	Not Detected
Oakleigh	Stalman	Not Detected
Takahiwai	Rangiora Pa1	Not Detected
Takahiwai	Rangiora Pa2	Not Detected
Hewlett Point	Hewlett1	Not Detected
Hewlett Point	Hewlett2	Not Detected
Pahi	Pahi1	Not Detected
Pahi	Pahi2	Not Detected
Pahi	Pahi3	Not Detected
Pahi	Pahi4	Not Detected
Pahi	Pahi5	Not Detected
Pahi	Pahi6	Not Detected
Pahi	Pahi7	Not Detected

## Discussions and Recommendations

Two five-yearly Kiwi Listening Blitz surveys have assisted with understanding changes in Northland brown kiwi distribution within the Kiwi Coast project area. The differences found in kiwi presence at a number of re-surveyed sites between 2016 and 2021 suggests that the monitoring is successfully detecting changes and that kiwi distribution is indeed expanding.

All sites found to have kiwi present in 2016, still had kiwi present in 2021. This is testament to the dedicated efforts of Northlanders to care for their kiwi and help them flourish. The positive trend in the Northland brown kiwi population is also evident in the long term monitoring data from the Annual Kiwi Call Count Surveys (Craig, 2021).

50% of sites that did not detect kiwi in 2016 were found to have kiwi in the second Kiwi Listening Blitz. These results were of great delight to the landowners and communities involved who had been working hard to 'get kiwi back' with intensive predator control and improved dog control.

The biggest cluster of sites surveyed during the second listening blitz that did not detect kiwi (37 sites) were located in the area between Whangarei and Waipu. The absence of kiwi in this area has been noted since at least 1995 (eg, Miller and Pierce) and may be due to the lower number of active projects and groups in the area, as well as the increased presence of ferrets. Hopefully, the emergence of further community-led projects in this area will help to restore kiwi to this area in time.

The detection of kiwi at a number of new survey sites between Whangarei Heads and Tutukaka are an indication that Kiwi Coast's first kiwi corridor could be beginning to work as kiwi disperse into the area from the neighbouring strongholds.

It is hoped that Kiwi Coast's next Kiwi Listening Blitz in 2025 will find further positive trends in Northland kiwi distribution and dispersal.

## Acknowledgements

Kiwi Coast thanks Dr Verdurmen for leading the KLB#2 field crew, deploying the bulk of the KLDs and meticulously analysing the many hours of data. The professionalism shown at all times, dedication to ensuring the best results possible were obtained, and improvements made to data management are all greatly appreciated.

Dr Verdurmen:

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There are all the landowners who welcomed us on their land, accompanied us to the survey sites, shared their knowledge about the history of the land, Kiwi, other wildlife, plants, waterways, many wonderful personal stories and mostly their passion for looking after the land. It genuinely has been a privilege meeting you all. In no particular order: Yvonne Steinman and family, Beth, Jacqueline Knight, Sharlene Lord, Bryan Reynolds, Greg at Wilson Dam, Robert Browne, Simon Walker and Adele, Pauline at the Tangihua Lions Lodge, Rowan Stanley and family, Bruce Linsey and Soozee McIntyre, Kevin Judkins and family, Barry and Judy Foote, Sherry and John Doevendans, David Rathe and Karen, Alexandra Ashkettle, Sheryl on Corbett Rd, John Cash, Alec Jack, Brydie at Lonsdale Park, Roger Kingi, Jo and Steve Bennett, Aaron Martin, Daniel Lloyd and Ange, Ben Tau, Jeanie Murdoch and Shamare, Ellyett Hayes, Ross Guy, Mark and Jacqui, the Wild Kiwi Girls Nina, Jessie, Katarina and Paul Quinlan.

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