



KIWI COAST CALL COUNT REPORT 2014



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1.0 INTRODUCTION

The Kiwi Coast is a large landscape scale conservation connectivity project that aims to create a kiwi corridor along the eastern coastline of Northland. It stretches over 175km from Bream Head in the south to the Hihi peninsula in the Far North.

The vision of the Kiwi Coast is to *‘support and connect community-led kiwi recovery along the east coast of Northland’* and achieve linkages at three scales:

- Landowner to landowner → creating new Landcare and conservation groups
- Project to project → creating entities that coordinate a number of local projects and create additional biodiversity strongholds
- Stronghold to stronghold → creating corridors between strongholds

(For more information about the Kiwi Coast please click on the following link, [Kiwi Coast Project Plan](http://www.kiwicoast.org.nz), or go to <http://www.kiwicoast.org.nz>)

1.1 Northland brown kiwi call count monitoring

Call count surveys are the main tool used to assess trends in kiwi populations by providing an index of relative abundance to monitor population trends over time. Kiwi listening has been conducted annually in Northland using the best practice call count survey method since 1995. As community groups have become established more kiwi listening stations have been added to the original 24 stations that were set up in 1993. In 2014 a total of 105 stations were listened at throughout the range of Northland brown kiwi and 73 of those stations were within the Kiwi Coast (figures from kiwi listening data sent to DOC). That means approximately 70% of the kiwi listening that occurs in Northland happens within the Kiwi Coast!

Figure 1. The Kiwi Coast Area and groups involved as at July 2014.



1.2 Kiwi Coast kiwi monitoring plan

The Kiwi Coast kiwi monitoring plan was developed to allow the Kiwi Coast project to identify areas where gains have been made and focus attention on areas that need further management. The monitoring plan outlines three methods to provide the Kiwi Coast with way to measure what effect predator control and advocacy is having on the distribution and abundance of Northland brown kiwi. The three methods are:

1. Kiwi listening from existing stations
2. Rolling Front
3. 5 year kiwi listening blitz

1.3 Report objective

The objective of this report is to summarise the results of the 2014 call count monitoring of Northland brown kiwi (*Apteryx mantelli*) from existing stations within the Kiwi Coast area. Data from unmanaged sites in the 'rolling front' method are not currently available for analysis and the 5 year kiwi listening blitz is scheduled for 2015. Accordingly, outcome monitoring for methods two and three are not included in this year's report.

This report looks at population trends across the Kiwi Coast and breaks down the project area in to four sections for finer scale analysis. The four focus areas are:

- Whangarei Heads – Sandy Bay
- Marua – Russell State Forest
- Bay of Islands (inclusive of inland management sites)
- North of Bay of Islands

2.0 METHODS

The Northland brown kiwi annual call count survey followed the national kiwi call scheme methodology; listening was carried out during the dark phase of the moon for the first two hours of darkness, for four nights. The ideal kiwi listening conditions are dry and still, so these conditions were favoured wherever possible.

Kiwi listening in 2014 was carried out from 18 May – 6 June, with a back-up window 16 June – 5 July.

2.1 2014 kiwi listening data

Relevant data for the Kiwi Coast were received from the following management areas for 2014 (Figure 2; Table 1):

- | | |
|--------------------------|------------------------------|
| - Whakaangi | - Bay of Islands |
| - Mahinepua – Radar Hill | - Russell Peninsula |
| - Waimate North | - Tutukaka |
| - Hupara | - Sandy Bay |
| - Puketi Forest | - Whangarei Heads-Bream Head |

2.2 Data analysis

For the general trends occurring in each of the focus areas every station that was listened at for each respective year was included in the analysis. This means that every year there was a different combination of stations used in the calculations as not all stations are listened at every year. A Pearson's coefficient analysis was carried out to test the linear relationship of this data. This test indicates whether there is a statistically "real" call-rate trend (and assumed population trend) upwards or downwards over time compared with stable (flat-line) call rates and assumed stable underlying populations.

For the analysis of site specific trends information from the DOC Northland kiwi listening report was incorporated into this report. The mean hourly call count is calculated for each year from the same selection of listening stations so that comparisons in call rates over time and the population trend of that site is the most accurate (see Appendix 3). This data was also plotted in a scatter plot and the trend of the data analysed to determine whether sites were showing statistically significant increasing (or decreasing) trends. Also included in this section are graphs of the kiwi listening results from stations at each management site that are regularly listened at so that readers can track changes of individual stations.

3.0 WHANGAREI HEADS – SANDY BAY

3.1 General Trends

Results from kiwi listening stations in the Whangarei Heads – Sandy Bay area show that from 2003-2010 mean call count rates were stable around 4 calls/hr. In 2011 there was a marked increase in call count rates 2011 and it has continued to climb (Fig. 2 & 3). The 2014 result of 6.2 calls/hr is the second highest mean recorded and only a slight decrease from the high of 6.4 calls/hr in 2013. A Pearson's coefficient analysis shows that there is a very significant positive linear relationship ($r = 0.8865$, $n = 12$, $p < 0.001$) and we can conclude that this is indicative of an increasing kiwi

population within the management sites of this focus area. The number of stations that are listened at annually has remained relatively stable since 2008 with the same stations being listened at each year. This consistency is incredibly valuable and a strength of the community groups that organize listening in this area.

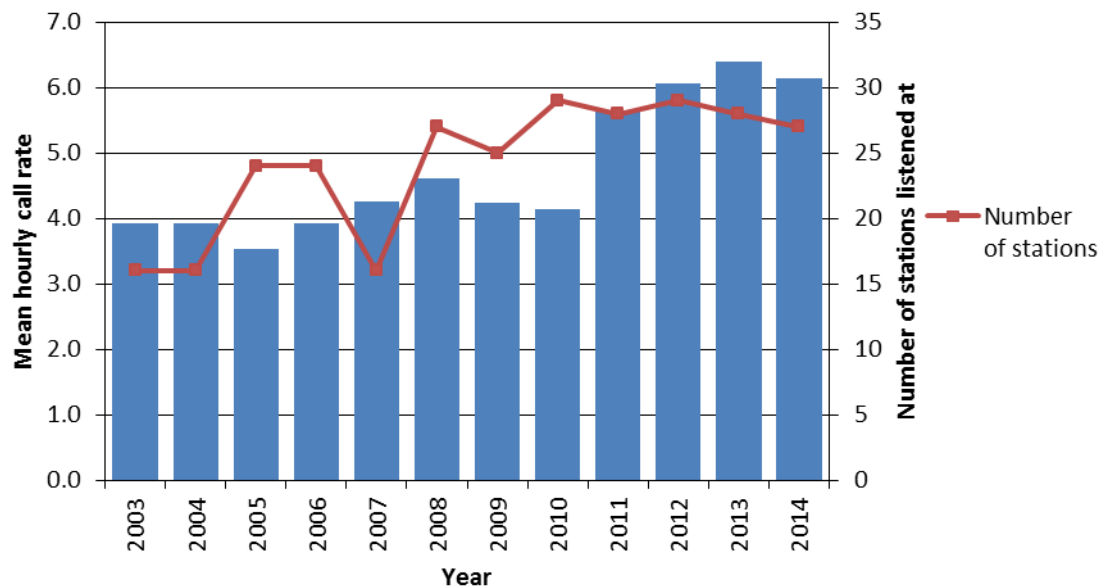


Figure 2. Mean hourly call rate from 2003-2014 from listening stations in the area from Whangarei Heads to Sandy Bay with the number of stations listened at plotted for each year. The mean hourly call rate was calculated from every station that was listened at in that respective year.

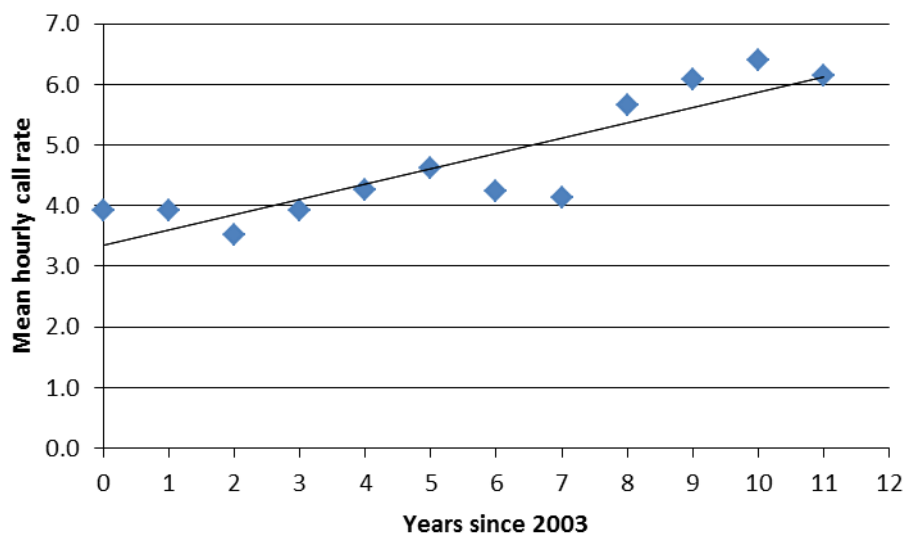


Figure 3. Scatterplot of mean hourly call rate from 2003-2014 from listening stations in the area from Whangarei Heads to Sandy Bay with trend line ($y = 0.1238x + 7.7793$). The mean was calculated from every station that was listened at in that respective year.

3.2 Site Specific Trends

Bream Head/Taurikura

The Bream Head/Taurikura site experienced a decline in call counts from 8.68 calls/hr in 2013 down to 6.19 calls/hr in 2014 (Fig. 4). This has gone against the previous solid pattern of increasing

call counts for this area. One station was missing from this analysis (station 44) and the absence of this data is a contributing factor to the cause for this decline as the previous year this site had recorded 10.75 calls/hr. However, there was also a large drop in call counts at station 42 from 7.63 calls/hr in 2013 to 2.13 calls/hr (Fig. 6). There has been a consistent listener at this station for the last two years so it will be important to see what next year's results bring for this station. It is strongly recommended that all five stations get listened to in 2015 so a more accurate analysis can be made for this site. Despite the decline in 2014 the long term trend shows a statistically significant positive linear relationship and confirms that the kiwi population at Bream Head/Taurikura is increasing (Pearson's coefficient analysis $r = 0.854$, $n = 10$, $p < 0.001$; Fig. 5). If the call counts continue on this trajectory it is predicted from the trend line that the 2014 call count rate will be doubled in six years.

The 2014 mean was calculated from four stations, each of which were listened from for four nights.

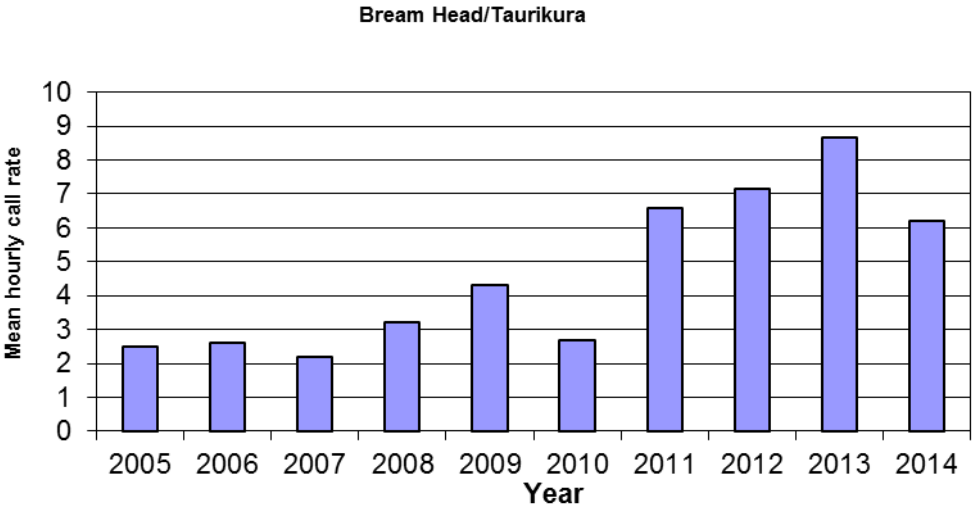


Figure 4. Trends in mean call count at Bream Head/Taurikura management site

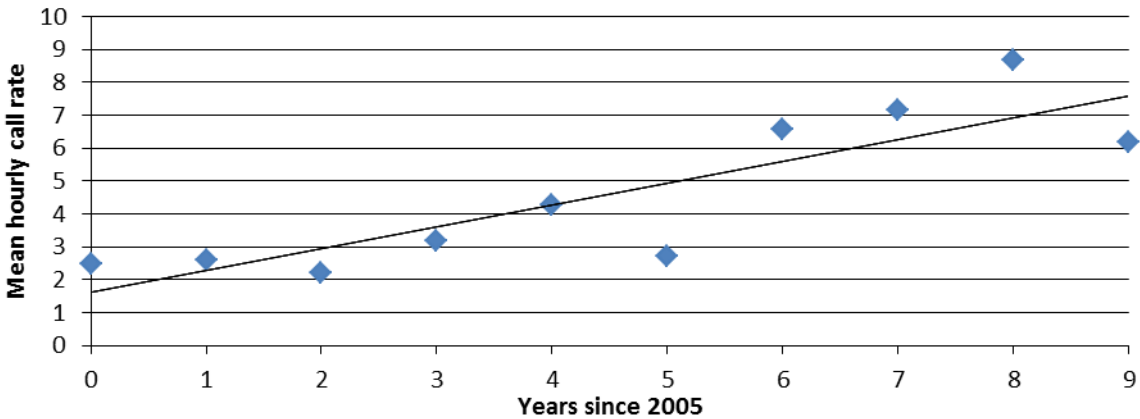


Figure 5. Scatter plot of mean call counts at Bream Head/Taurikura management site from 2005-2014 with trend line ($y = 0.6607x + 1.64$)

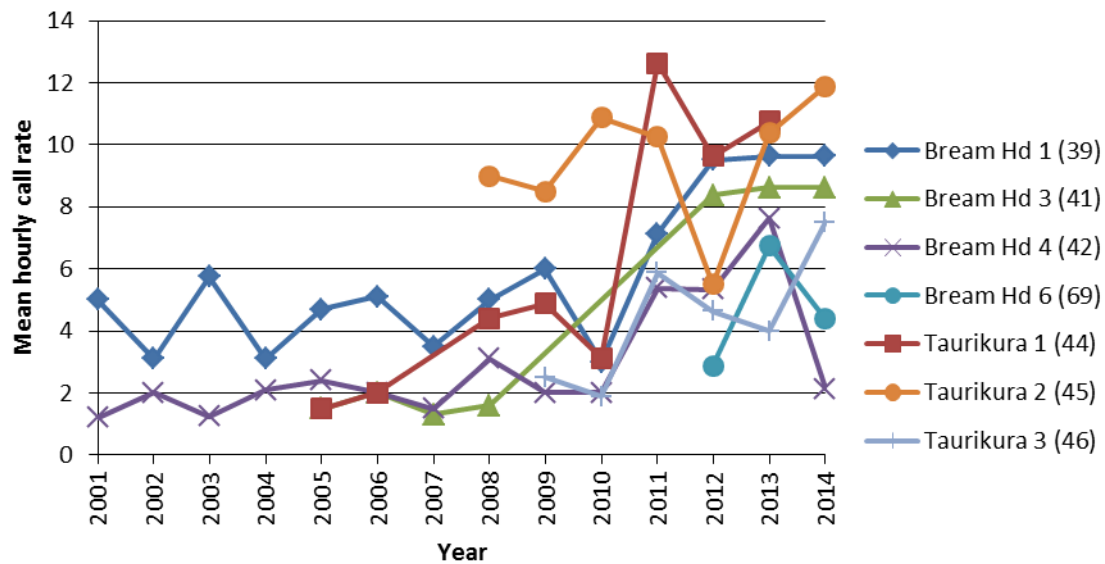


Figure 6. Kiwi call count results for Bream Head listening stations (station number in brackets) since 2001.

Kauri Mountain

The kiwi call counts for Kauri Mountain increased to 4.95 calls/hr an increase of 1.12 calls/hr on the previous year. It is the highest recorded call count for this management site which has been showing an increasing trend at all of the listening stations since 2006 (Fig. 7 & 9). The positive linear relationship is statistically significant (Pearson's coefficient analysis $r = 0.747$, $n = 10$, $p = 0.006$; Fig. 8) and confirms the kiwi population at this site is increasing. The fact that this management site has doubled its call count rate since listening began in 2001 is very encouraging and this site is becoming a great example of steady recovery gains that can be made from relatively low kiwi numbers over time through community kiwi protection.

All five stations that are used to derive the mean for this management site were listened at for four nights. Thank you listeners!

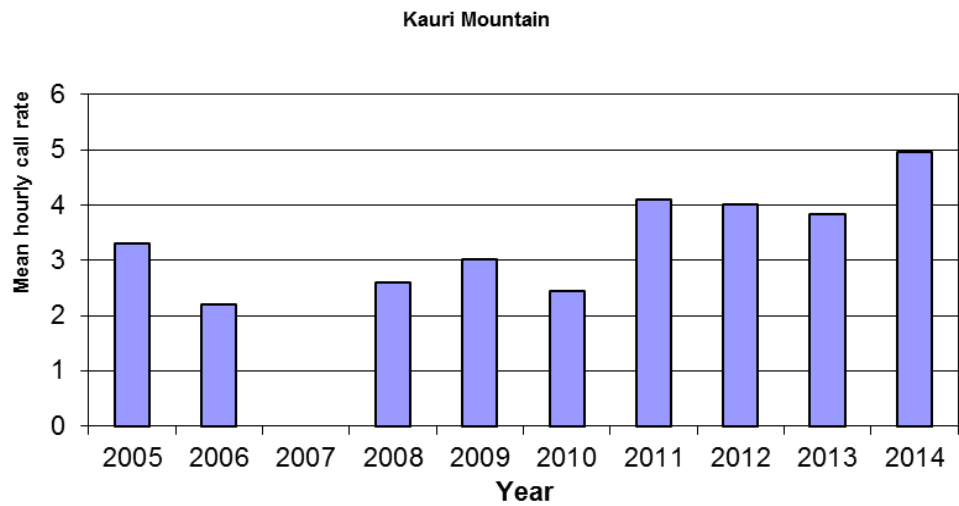


Figure 7. Trends in mean call count at Kauri Mountain management site

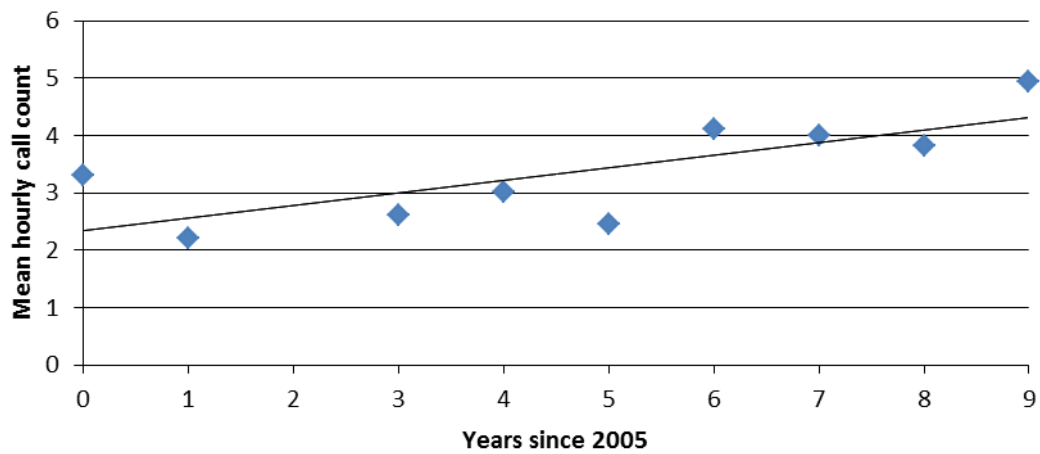


Figure 8. Scatterplot of mean call counts at Kauri Mountain management site from 2005-2014 with trend line ($y = 0.2202x + 2.33$)

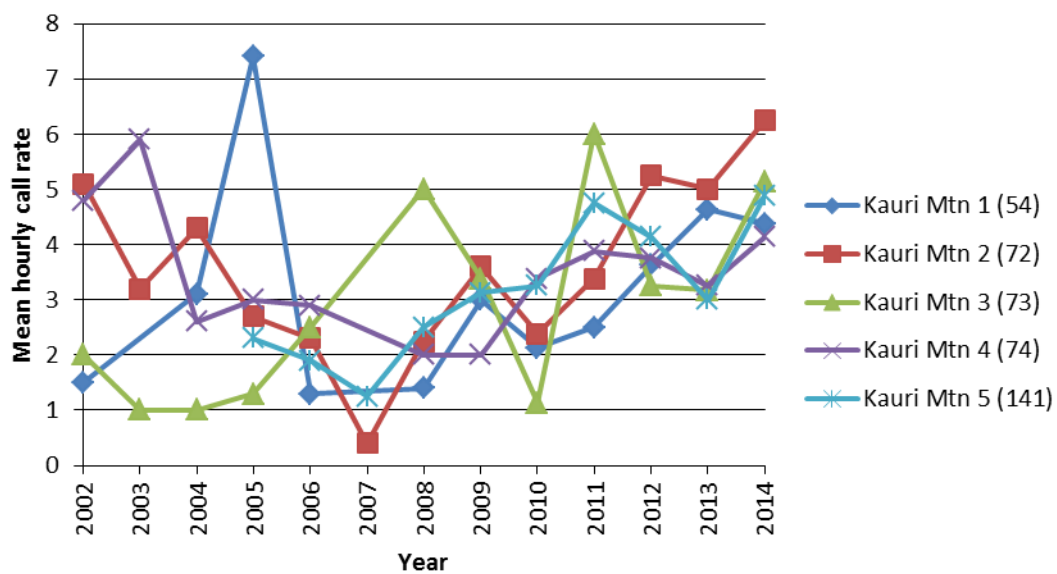


Figure 9. Kiwi call count results for all Kauri Mountain listening stations (station number in brackets) since 2002.

Manaia-The Nook

This management site recorded a slight increase in call counts from 6.43 calls/hr in 2013 to 6.81 calls/hr in 2014 (Figure 10). One site used to derive the mean was missing (station 71) and if the average of this site since 2002 (1.66 calls/hr) is taken into consideration then the adjusted call rate would drop to 5.78 calls/hr. Although there has been a slight decline in numbers from a peak call count of 7.75 calls/hr in 2012 the overall trend at this site is indicative of a healthy and increasing population which is reflected in the strongly significant positive linear relationship of the data (Pearson's coefficient analysis $r = 0.918$, $n = 13$, $p < 0.001$; Fig. 11). Based on this analysis mean call rates are predicted to reach double figures by 2020. The recent successful community-initiated 1080 pulse in Mt Manaia will likely lead to further increases in kiwi call counts in the future. Results from listening station Manaia 2 (48) are already impressive with mean call count rates increasing from 4 calls/hr in 2001 to ~16 calls/hr in 2014 (Fig. 12). Results from The Nook 1 (127) station are concerning however as it is showing an obvious declining trend for the past four years and registering only 4 calls/hr in 2014 compared to ~9 calls/hr in 2011.

A total of five stations were listened at, all with four nights of listening completed at them. Four of these stations were used to derive the mean.

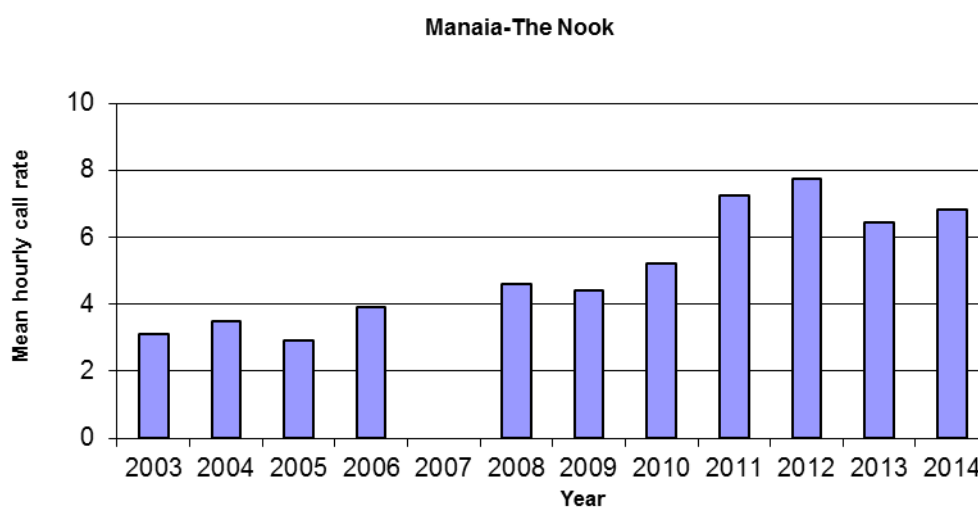


Figure 10. Trends in mean call count at Manaia-Nook management site

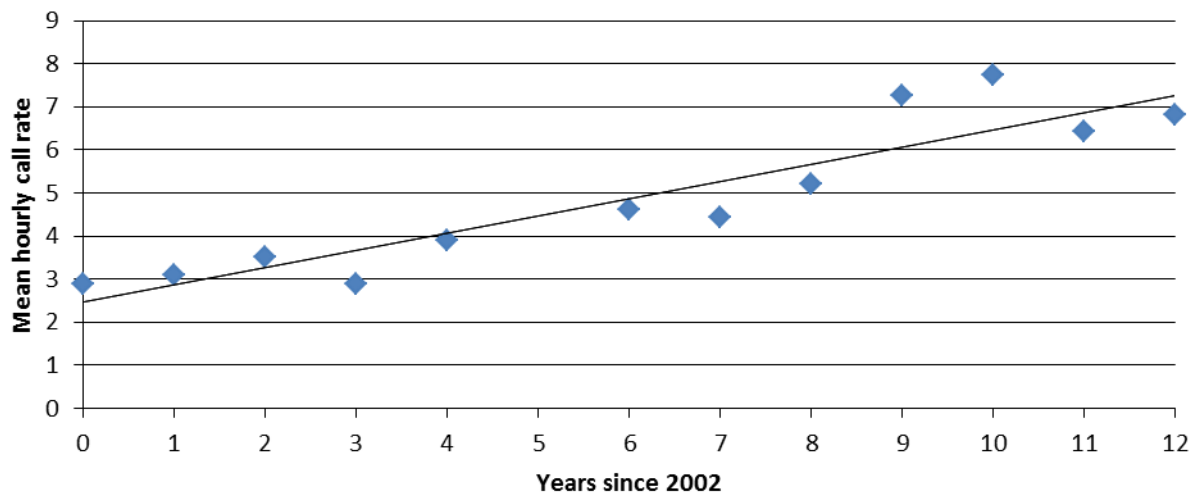


Figure 11. Scatterplot of mean call counts at Manaia-Nook management site from 2002-2014 with trend line ($y = 0.3.994x + 2.47$)

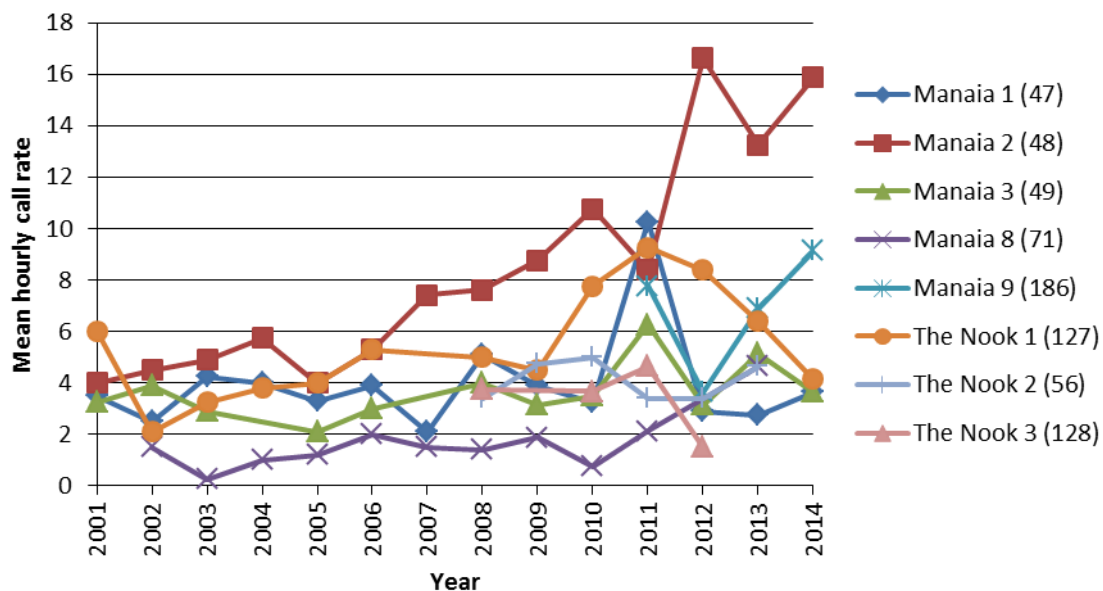


Figure 12. Kiwi call count results for Manaia-The Nook listening stations (station number in brackets) since 2001.

Glenbervie Forest

Glenbervie Forest is a forest remnant that contains both native and exotic forest habitat. The two listening stations within Glenbervie have been listened at since 1995 as two of the 24 original listening stations that were set up in 1993 as part of the national kiwi monitoring programme. The mean hourly call rate from the two stations is shown in Figure 13. In 2014 only one night of listening was carried out at listening station Glenbervie 7A (station 21) with questionable results so this data was not included and therefore the mean hourly call rate for 2014 only represents the results from the Glenbervie 9A station (station 22). Despite a peak in 2004 (only station 22 was listened at) there has been a statistically real declining trend from 1995-2011 (Pearson's coefficient

analysis $r = 0.6263$, $n = 20$, $p = 0.002$; Fig. 14) which is not surprising given that there has been no sustained predator control occurring at this site until the recent initiation of predator control work by the forestry company Rayonier in 2014. If predator control is not maintained at this site and the population continues on its current downward spiral it is predicted that it will only take 9 years until kiwi are no longer detected at these two stations (Fig. 14). The rebound in call rates in 2012 and 2013 is promising (Fig. 13) however this was not maintained in 2014 with the drop in call rates at Glenbervie 9A and missing data from Glenbervie 7A. It is highly recommended that both stations be listened at in 2015 and beyond to better monitor the future response kiwi have to the introduction of predator control.

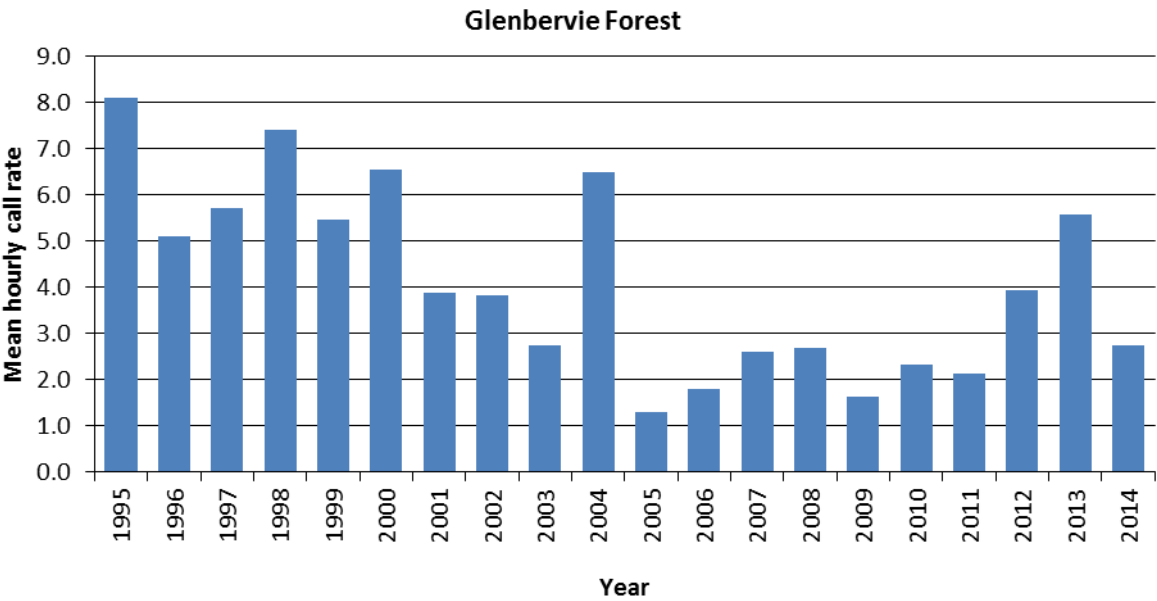


Figure 13. Trends in mean call count at Glenbervie Forest management site

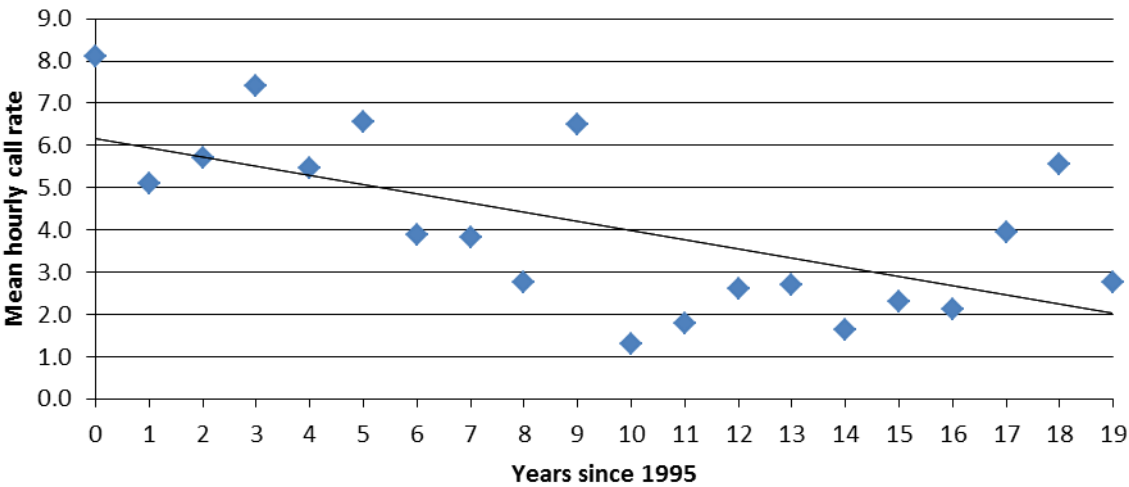


Figure 14. Scatterplot of mean call counts at Glenbervie Forest management site from 1995-2014 with trend line ($y = -0.2179x + 6.17$)

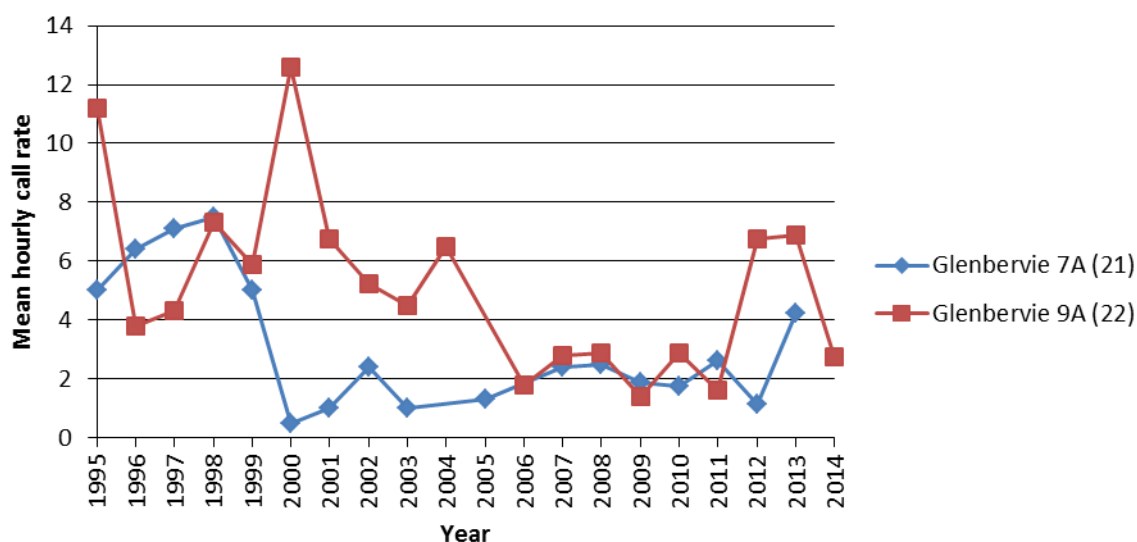


Figure 15. Kiwi call count results for Glenbervie Forest listening stations (station number in brackets) since 1995

Tutukaka

The mean call rate of 6.17 calls/hr in 2014 is derived from three stations (125, 142 & 143) out of the possible five and is the second lowest call rate since listening began in 2005 (Fig. 16). This relatively low call rate may be a little bit disappointing considering that this population is being supplemented with kiwi from Matakoho-Limestone Island. However, for the last three years there have only been two or three stations listened at from which the mean is calculated limiting what can be interpreted from the data. The scatterplot trend line indicates a slightly positive long term trend, however, there is no significant linear relationship of the data (Pearson's coefficient $r = 0.261$, $n = 10$, $p = 0.233$; Fig.17) possibly indicating a stable population. Kiwi listening at Tutukaka would benefit from a comprehensive listening coverage for 2015 and beyond to help get a better idea about what is happening with the population at this site and to better track the impact translocated kiwi are having on call rates.

A total of five stations were listened at in 2014, all with four nights of listening completed at them. Three of these stations were used to calculate the mean.

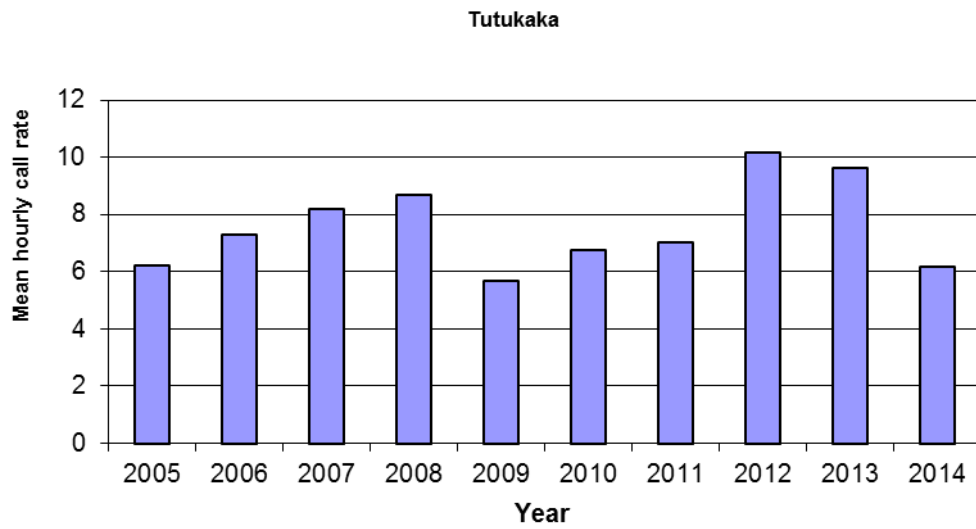


Figure 16. Trends in mean call count rates at Tutukaka management site

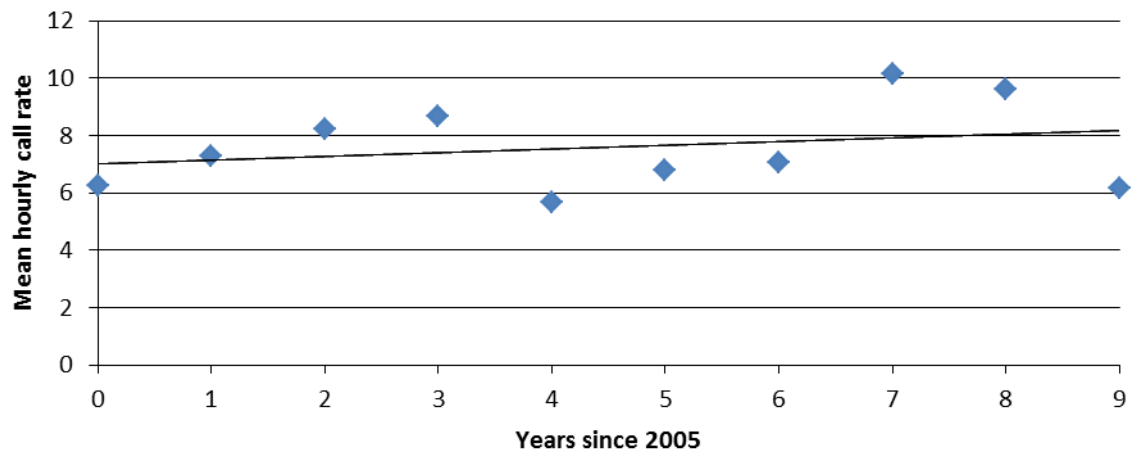


Figure 17. Scatterplot of mean call counts at Tutukaka management site from 2005-2014 with trend line ($y = 0.1315x + 7$)

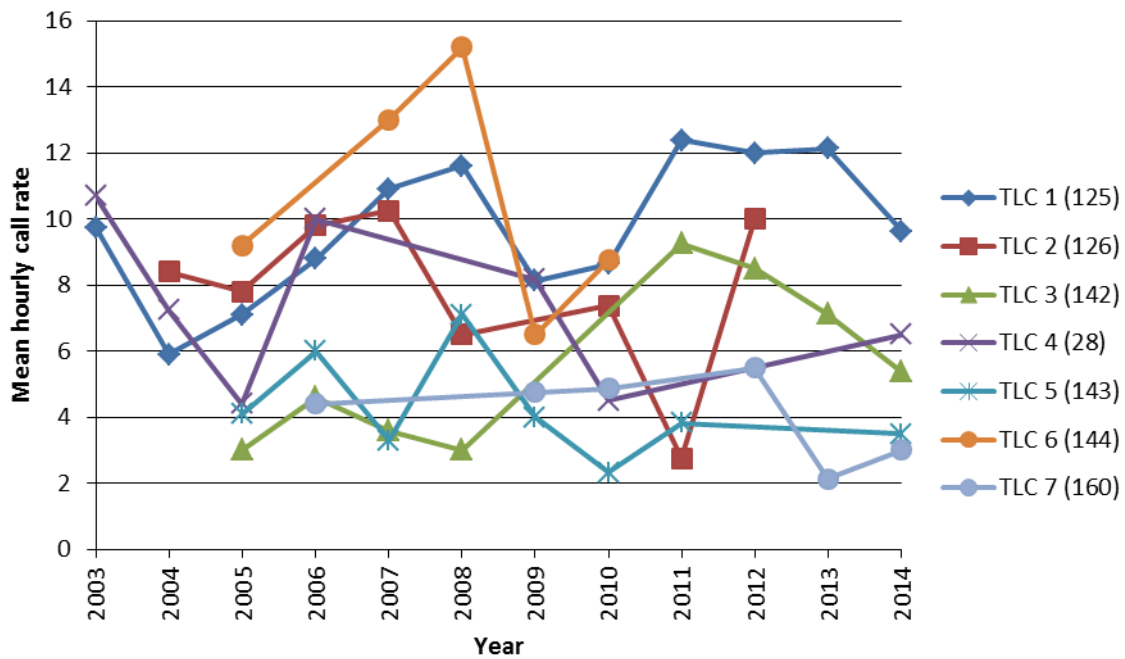


Figure 18. Kiwi call count results for Tutukaka listening stations (station number in brackets) since 2003

Sandy Bay

Sandy Bay recorded a mean call rate of 3.71 calls/hr in 2014. This site only has four years of data to compare annual call count means but it would appear that this site seems to be currently be staying around the ~3 – 4 calls/hr range (Fig. 19). The Sandy Bay 1 station (station 27) is one of the original 24 listening stations set up in 1993 and although there are gaps in the data where listening hasn't occurred it provides good base line data about kiwi at this site (Fig. 19). It is great to have data coming in from this site to allow for its kiwi population trend to be analysed. Well done to Nan Pullman who carried out a total of 24 hours of kiwi listening!

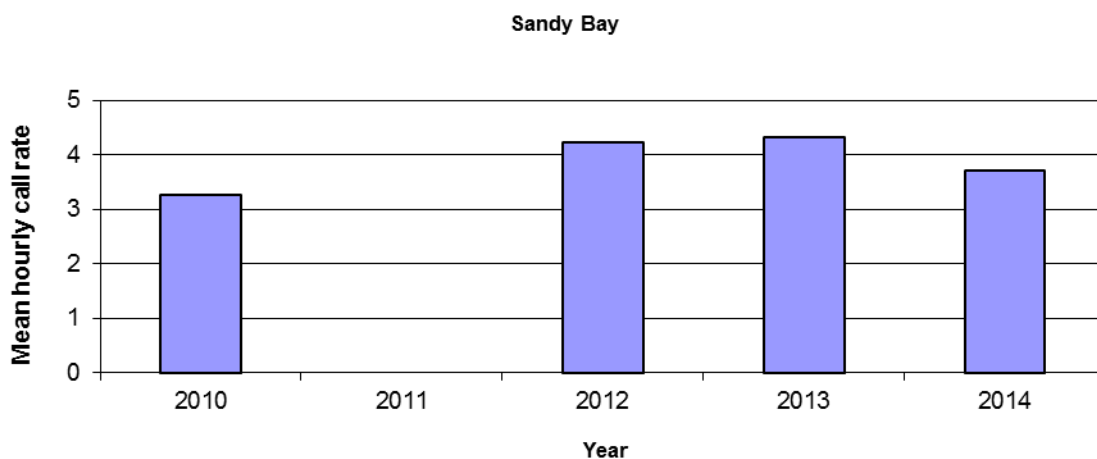


Figure 19. Trends in mean call count rates at Sandy Bay management site

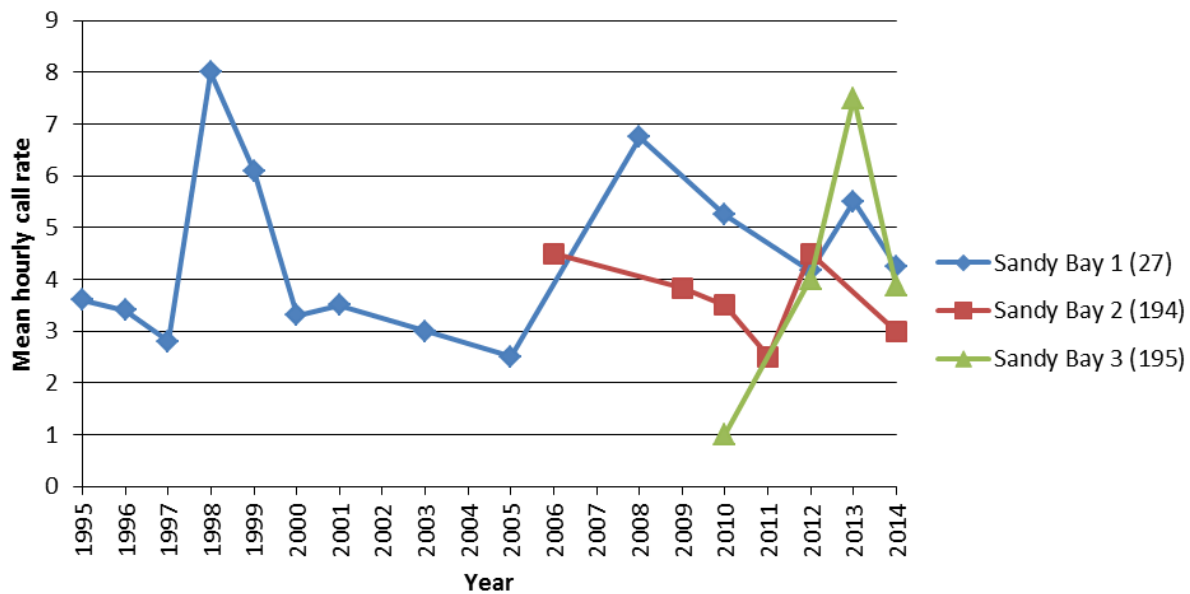


Figure 20. Kiwi call count results for Sandy Bay listening stations (station number in brackets) since 1995

3.3 Summary

The general trend across the Whangarei Heads-Sandy Bay focus area shows that the kiwi population is increasing. This result is largely attributed to the Whangarei Heads stronghold continuing with its impressive gains in kiwi recovery across all management sites. This is cause for celebration for this community who are playing their part by being directly involved in the landcare groups and/or keeping their dogs under control. The Tutukaka/Sandy Bay stronghold are maintaining stable populations but are yet to see the same gains in relation to the predator control work being undertaken. As previously mentioned the Tutukaka site would benefit from a more complete kiwi listening coverage in the coming years to gain a better picture of the population dynamics. The long term listening results from Glenbervie are indicative of the decline in kiwi populations that occur at sites with no predator control. Glenbervie Forest is a key habitat between the Whangarei Heads and Tutukaka strongholds and it is great that Rayonier has started predator control in their forest to contribute towards creating a safe corridor. Listening at the two kiwi listening stations needs to be maintained to monitor whether the kiwi population is responding to predator control.

4.0 Marua – Russell State Forest

4.1 General Trends

There are only three listening stations that are currently located within this focus area so an analysis of the general trends in kiwi call count rates cannot be done as it would not be a true reflection of what is occurring across this entire area.

4.2 Site Specific Trends

Mimiwhangata

The Mimiwhangata station is one of the original 24 stations that has been listened at since 1995. DOC has maintained a predator control programme in operation at Mimiwhangata for kiwi and pateke protection as well as periodic 1080 operations. Call count rates at this station have fluctuated quite a lot, recovering from a very low call count in 1999 to record results ranging between 15-20 calls/hr from 2001-2007 (Fig. 16). These high call rates have declined since then and now seem to be hovering around 10 calls/hr.

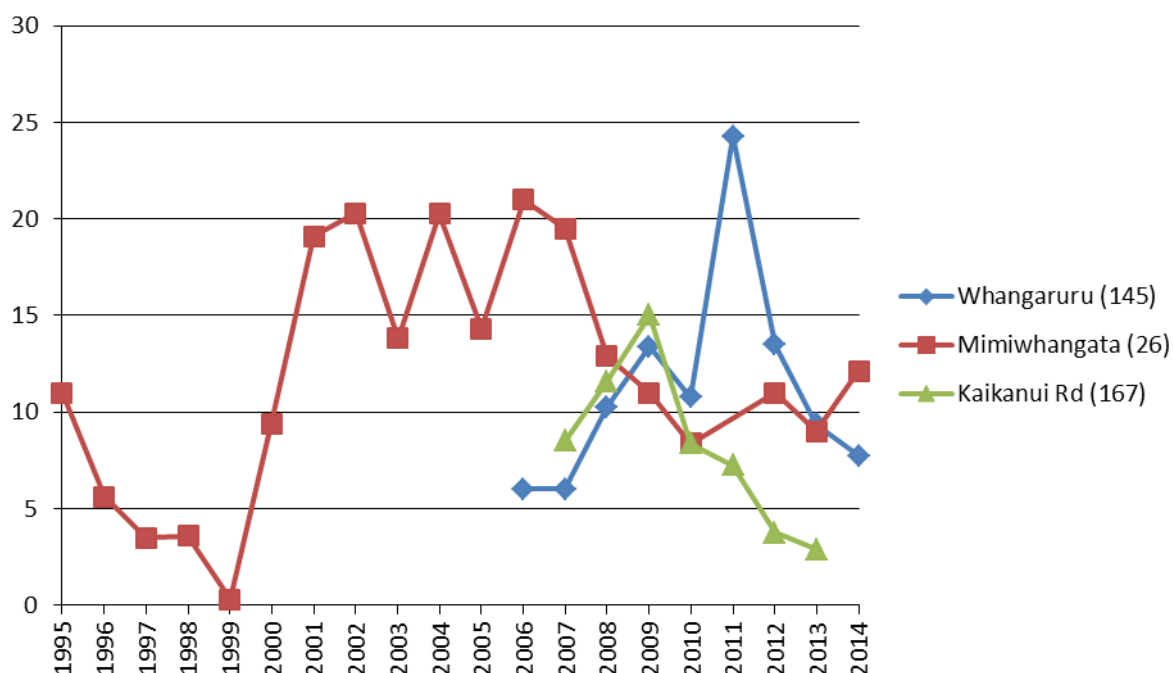


Figure 16. Kiwi call count results for Whangaruru, Mimiwhangata and Kaikanui Road listening stations (station number in brackets) since 1995

Whangaruru

The Whangaruru listening station is located in Whangaruru North Head Scenic Reserve at the end of the Whangaruru peninsula. This site is a priority conservation site ranked by DOC in the top 500 ecosystems nationally. This reserve is trapped as part of the Whangarei Kiwi Sanctuary and has also had periodic 1080 operations carried out. There was a dramatic increase in call rates in 2011 where it jumped to nearly 25 calls/hr. This results looks to be an anomaly as subsequent results have fallen back into the normal range for this station with ~8 calls/hr being recorded in 2014. There have been issues with dogs at Whangaruru and this is likely to have had a negative impact on kiwi recovery at this site.

This station was not listened at in 2014, the first time it hasn't had listening occur there since 2007. What is very obvious from the past listening results is that the kiwi population at this station is declining with call rates decreasing from a high of 15 calls/hr in 2009 to less than 3 calls/hr in 2013 (Fig. 16). It is strongly recommended to resume kiwi listening at this station in 2015 to monitor what the population is doing in this unmanaged site in the Marua-Russell State Forest focus area.

4.3 Summary

There is great opportunity for expansion of kiwi listening throughout kiwi habitat in the Marua-Russell State Forest focus area. This will be part of the rolling front method in the Kiwi Monitoring Plan to establish baseline monitoring as predator control starts to expand into this area. It will be exciting to watch the progress that is made in this focus area that contains extensive kiwi habitat and is the area connecting the Bay of Islands stronghold with the Tutukaka/Sandy Bay stronghold. At this point the minimum would be to maintain listening at three established stations and encourage the Kaimamaku Landcare Group to begin kiwi listening in 2015 and start submitting their data to the Department of Conservation as part of the Northland brown kiwi monitoring.

5.0 BAY OF ISLANDS (including inland management sites)

5.1 General Trends

The number of kiwi listening stations in the Bay of Islands increased to a peak of 74 stations in 2010 but declined to 33 in 2014 (Fig. 17). The variation in station numbers and associated absence of data means that only limited weight can be given to the general trend information. The mean hourly call rates from stations listened at each year shows a slight declining trend however, a Pearson's coefficient analysis shows that there is no significant linear relationship ($r = 0.1520$, $n = 20$, $p = 0.2612$) and an examination of the scatterplot suggests that a curved trend line may be a better fit to the data (Fig. 18). To get a better grasp of the general trend in the Bay of Islands another analysis was carried out on stations in the Bay of Islands area that fit the criteria of only having one year of data missing since 2006. A total of 25 stations fit the criteria and provided a good representation of the area (9 from Purerua/Kerikeri, 7 from Puketi, 4 from Russell, 5 from Waimate North). This analysis showed a significant positive linear relationship ($r=0.706$, $n=9$, $p=0.02$) suggesting an increasing kiwi population trend across management sites in the Bay of Islands. It is important to note here that listening stations with low and/or decreasing call counts (and dwindling kiwi populations) are often listened at less regularly than sites with good call rates. Therefore the stations that fit the criteria may be biased towards sites that are showing signs of kiwi population recovery.

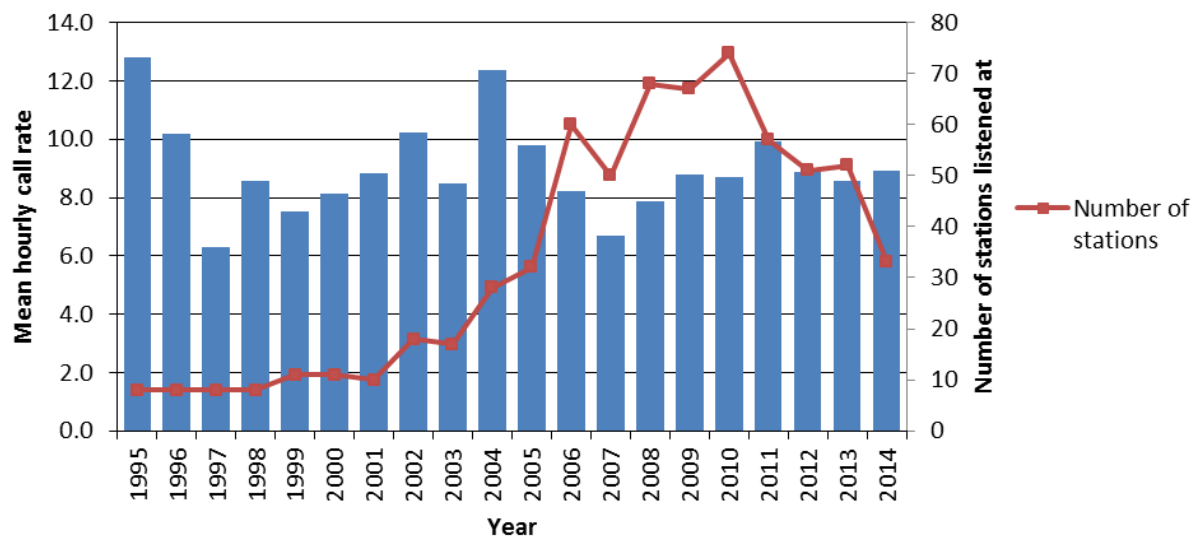


Figure 17. Mean hourly call rate from 1995-2014 from listening stations in the Bay of Islands area with the number of stations listened at plotted for each year. The mean hourly call rate was calculated from every station that was listened at in that respective year.

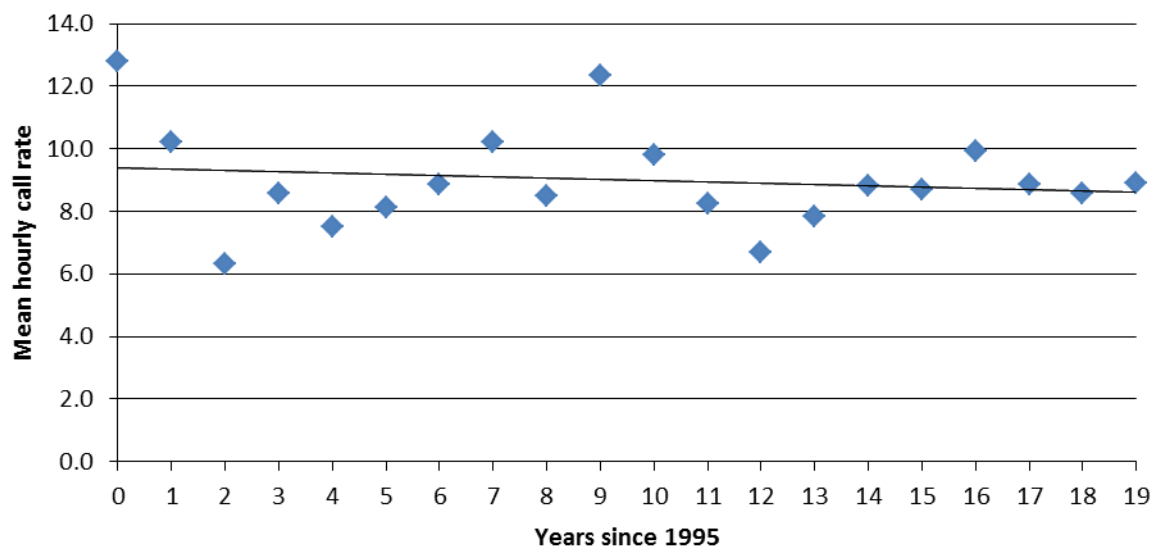


Figure 18. Scatterplot of mean hourly call rate from 1995-2014 from listening stations in the Bay of Islands area with trend line ($y = -0.041x + 9.38$). The mean was calculated from every station that was listened at in that respective year.

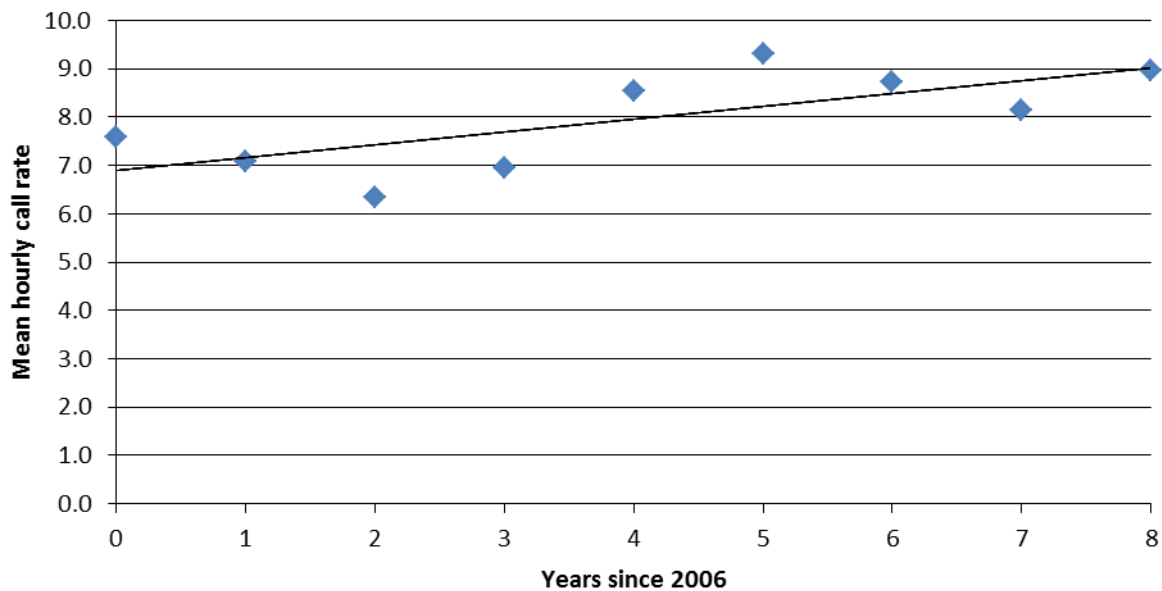


Figure 19. Mean hourly call rate from 2006-2014 with trend line ($y = 0.2691x + 6.97$) from 25 listening stations in the Bay of Islands area that have only one year of data missing since 2006

5.2 Site Specific Trends

Original stations in Bay of Islands

Five of the original kiwi listening stations set up in 1995 were located in forest remnants and extensive exotic forestry in the Bay of Islands area spanning Purerua Peninsula-Waitangi-Russell Peninsula. This cluster of sites experienced a decline in call counts in 2014 (Fig. 20). This was mainly attributed to the decline in the mean call count at the Marsden Cross station which recorded 19 calls per hour in 2014 down from 30 in 2013 (Fig. 21). The average call rate for Marsden Cross over the last five years has been ~28 calls/hr so it will be important to assess the results of this station in 2015 to see if the depressed call rate remains. The results at Marsden Cross skews the data for this cluster, although only two sites in this cluster, station 11 (Puketotara) and station 12 (Rangitane), recorded increases with the rest (excluding Marsden Cross) showing decreases between 2.12 - 4.38 calls/hr (Fig. 21). Station 13 (Waitangi No. 12) recorded its lowest mean since listening has begun dropping to under 5 calls/hr. Since 2011 there has been a downward trend in kiwi listening results in this cluster but the overall trend since 1995 shows a statistically significant positive linear trend ($r = 0.507$, $n = 20$, $p=0.013$) of increasing mean call rates and associated kiwi population increase across these stations.

All six stations in this cluster were listened at for four nights except for station 11 which was listened at for three nights. No data was received from any other stations in the Purerua/Kerikeri area in 2014.

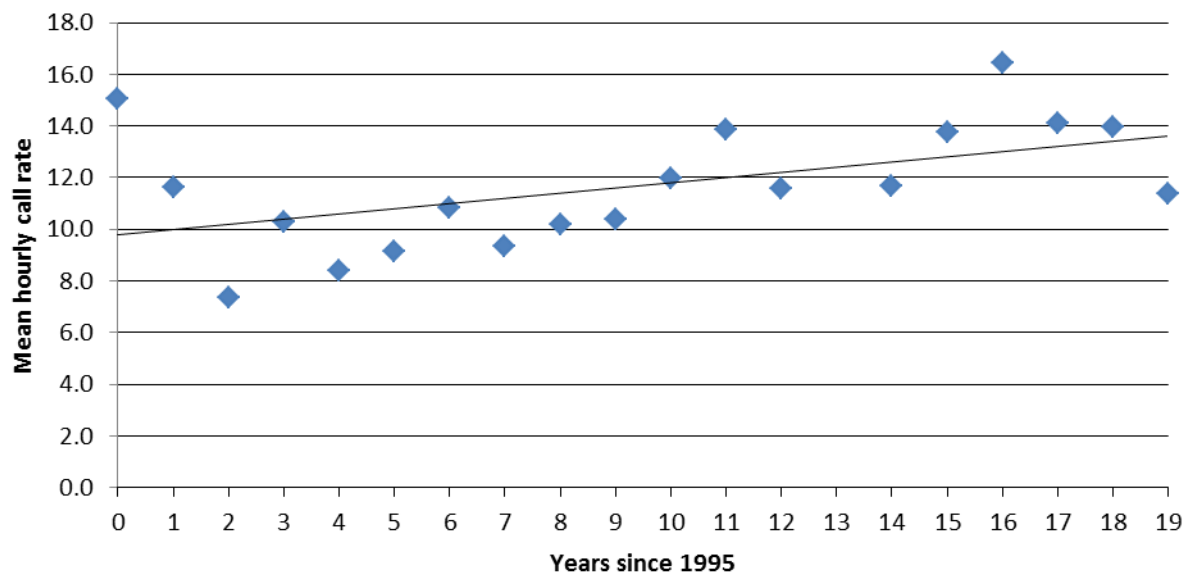


Figure 20. Scatterplot of mean hourly call rate from the cluster of original stations that have been listened at from 1995-2014 with trend line ($y = 0.2011x + 9.77$)

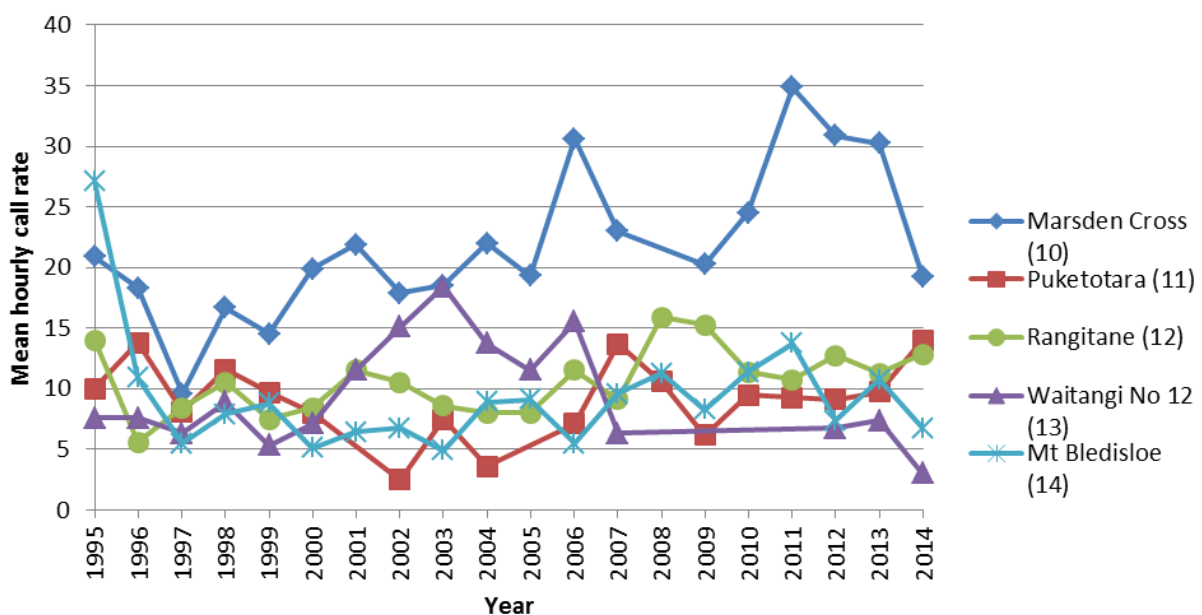


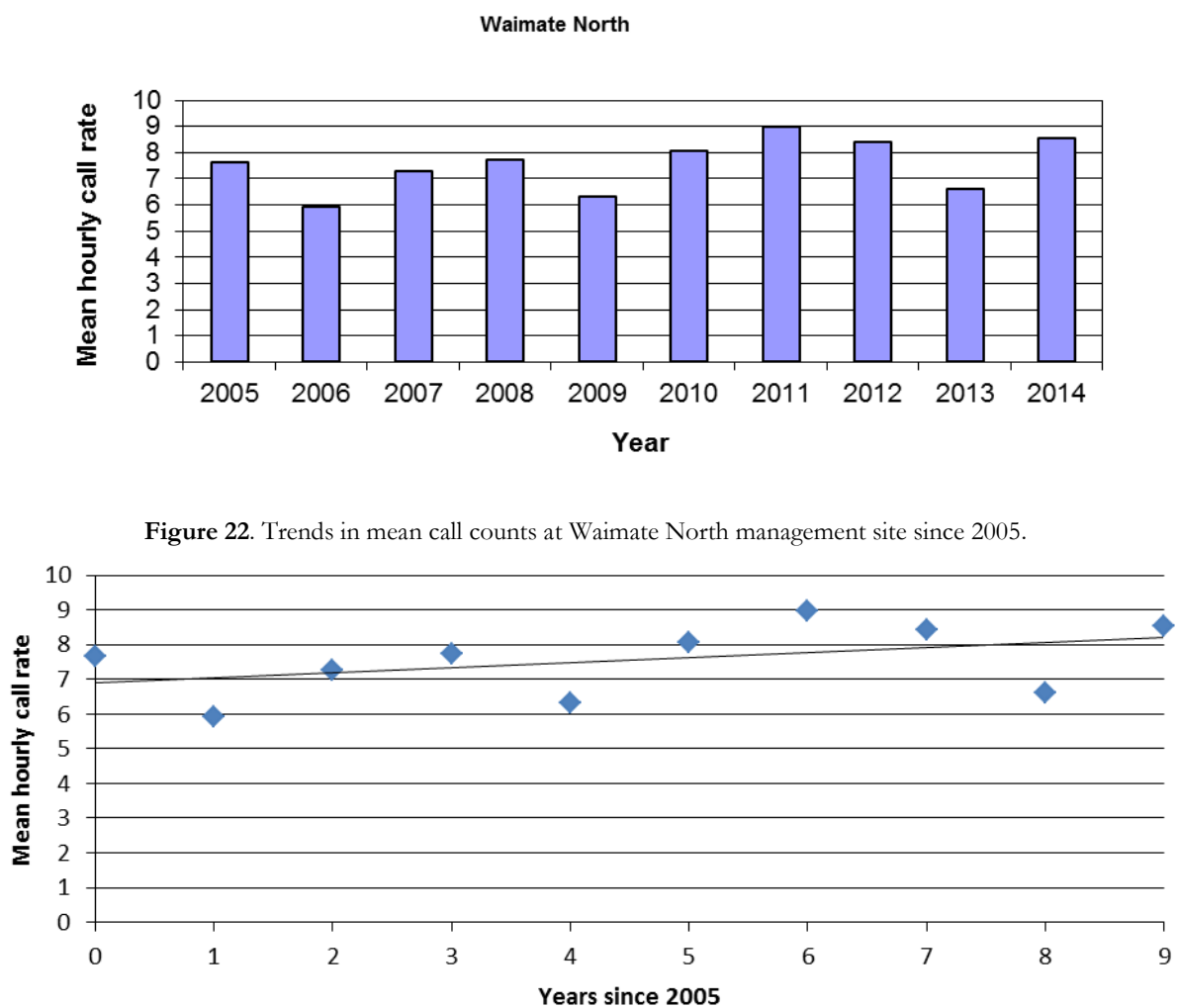
Figure 21. Kiwi call count results for the five original kiwi listening stations (station number in brackets) that have been listened at since 1995

Waimate North

Waimate North had an increase in mean call counts from the previous year; from 6.60 calls/hr in 2013 to 8.55 calls/hr in 2014. Only two out of the nine stations (114 & 116) listened at had a reduced call rate compared to 2013 and there were some stand out increases with station 121 jumping from 1 call/hr in 2013 to 5.50 calls/hr in 2014 and station 122 increasing from 4.13 to 8.00 calls/hr (Fig. 24). The Waimate North management site has maintained, since 2005, a range in mean

call counts between ~6 and ~9 calls/hr (Figure 22) indicating a healthy and stable population (Pearson's coefficient analysis $r = 0.1901$, $n = 10$, $p = 0.1039$ i.e. the slightly positive trend is not statistically significant so population is stable). They also have the distinction of having the station that recorded the highest average call count across all Northland stations with station 113 (W1) hearing an average of 27.13 calls/hr (Fig. 24). Impressive!

A total of nine stations were listened from for this site, including all five stations from which the mean call rate is derived from. Each station had four full nights of listening. Well done Waimate North listeners!



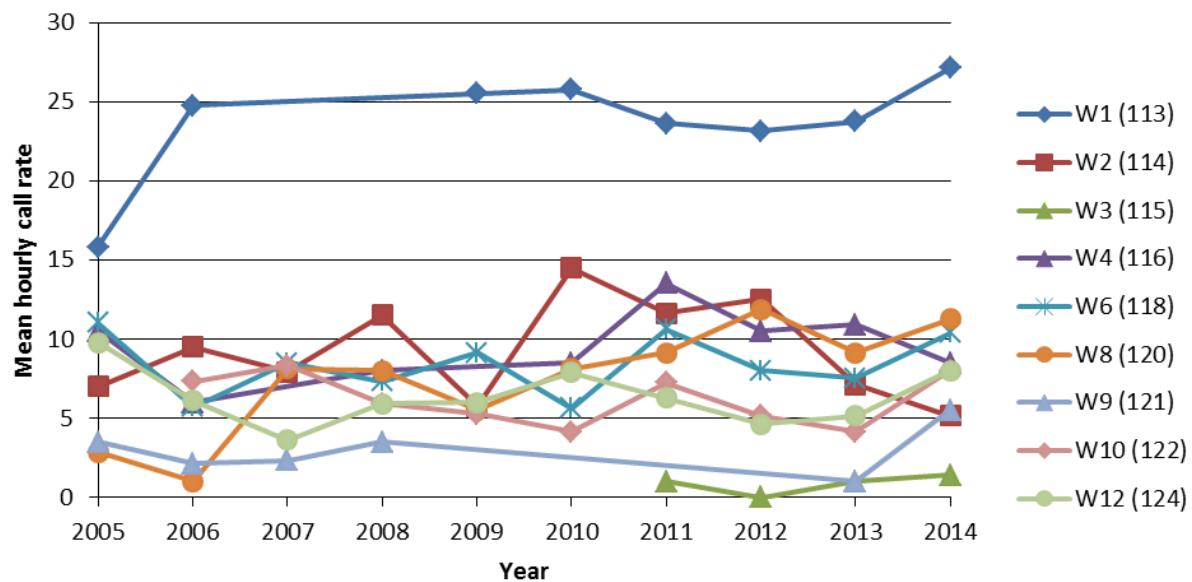


Figure 24. Kiwi call count results for kiwi listening stations (station number in brackets) that have been listened at since 2005

Hupara

This year three stations (191, 245, and 257) were listened at by Hupara Landcare and they returned a mean call rate of 14.67 calls/hr. This is a really high call rate and likely to represent a healthy kiwi population. These are great results and should be really encouraging. Keep up with the annual kiwi listening and next year data can start to be graphed. All three stations were listened at for four nights.

Puketi Forest

There was a jump in the mean call count rate for Puketi Forest from 3.6 call/hr in 2013 to 5.67 calls/hr in 2014 (Fig. 25). However, this mean was only derived from three out of the possible six stations (104, 108, and 111) that are normally used to calculate the mean. This increase in call rate is heavily influenced by this as the three stations not listened at (102, 105 & 106) are stations that usually return relatively low call rates. If the average call rates of the missing stations since 2006 are included in the analysis then the mean call rate drops to 3.7 calls/hr which is very similar to the 2013 result. This would suggest that in reality kiwi call rates are stable around the 3-4 calls/hr range rather than a marked increase in call rates. A scatterplot of the mean call rates (using the 5.67 calls/hr recorded for 2014) shows a strongly significant increasing population trend ($r = 0.796$, $n = 9$, $p = 0.005$) and predicts that call count rates will reach double figures in 12 years (Fig. 26). Two Puketi stations (stations 7&8) have been listened at since 1995 show that kiwi numbers have stayed stable over the past 20 years albeit with annual fluctuations (Fig. 27). Most listening stations are

showing increasing or stable call rates except for stations 107 (Takapau/Pirau Rd junction), which dipped to under 1 call/hr in 2014, and 112 (Stoatline 9) which is fast approaching 1 call/hr down from ~5 calls/hr 3 years ago (Fig. 27).

A total of six stations were listened at, three of which were used to derive the mean for this management site and all had four complete nights of listening carried out at them.

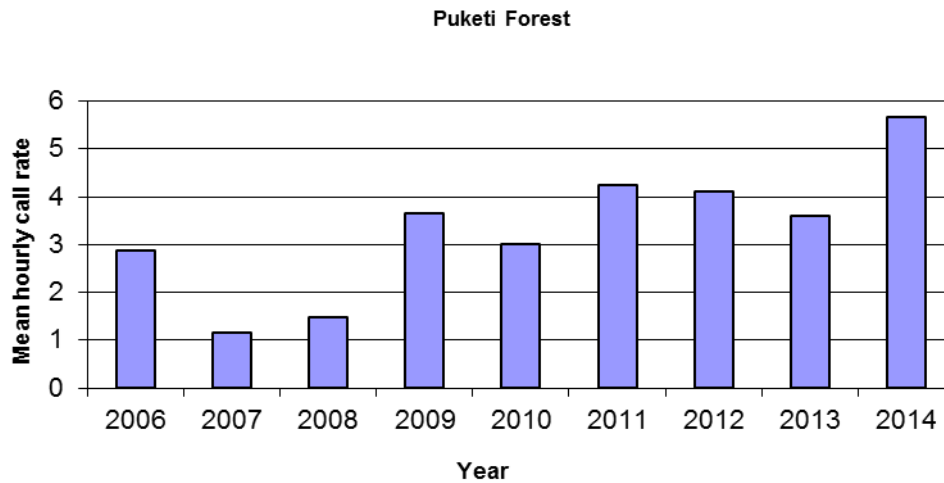


Figure 25. Trends in mean call counts at Puketi Forest management site

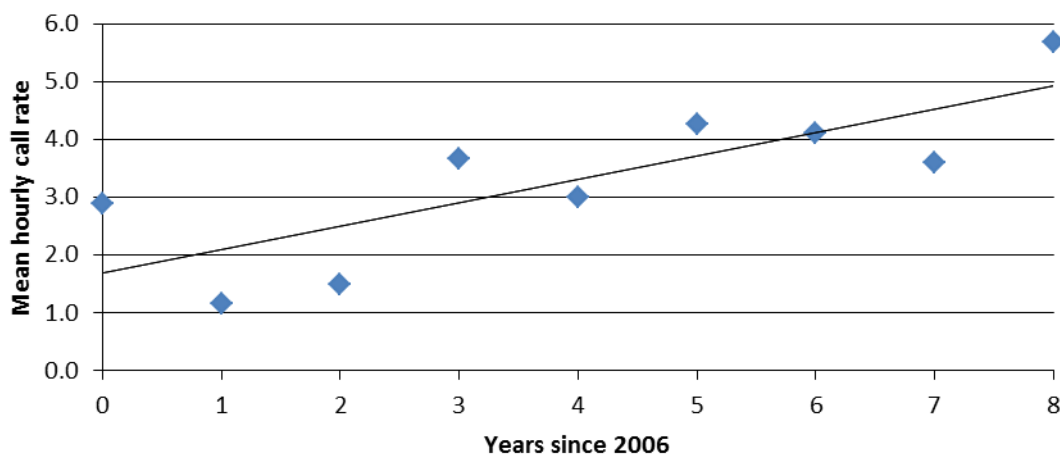


Figure 26. Scatterplot of mean hourly call rate at Puketi Forest management site from 2006-2014 with trend line ($y = 0.4058x + 1.69$)

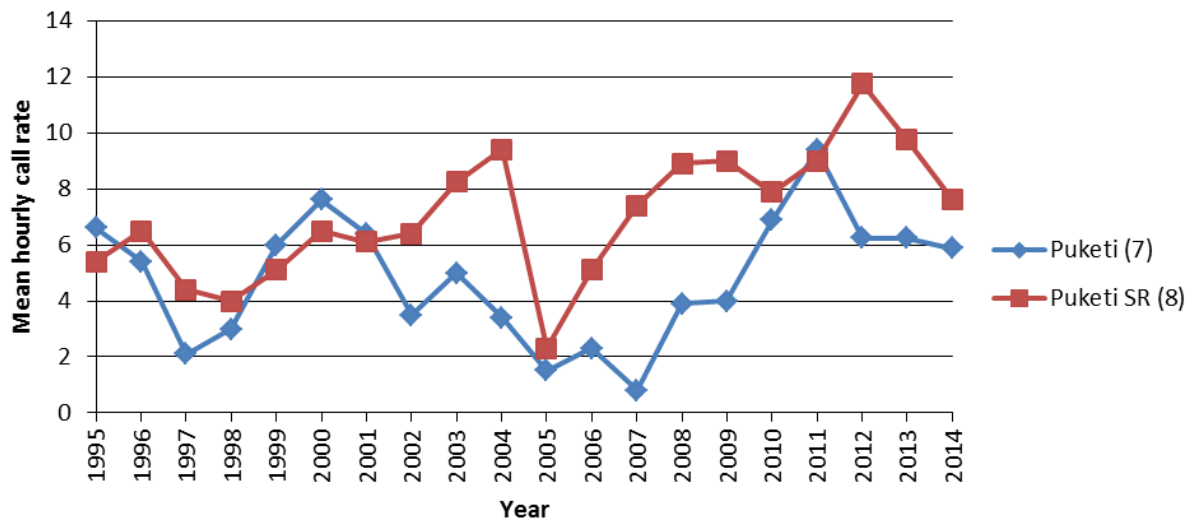


Figure 27. Kiwi call count results for the two original stations at Puketi (station number in brackets) that have been listened at since 1995

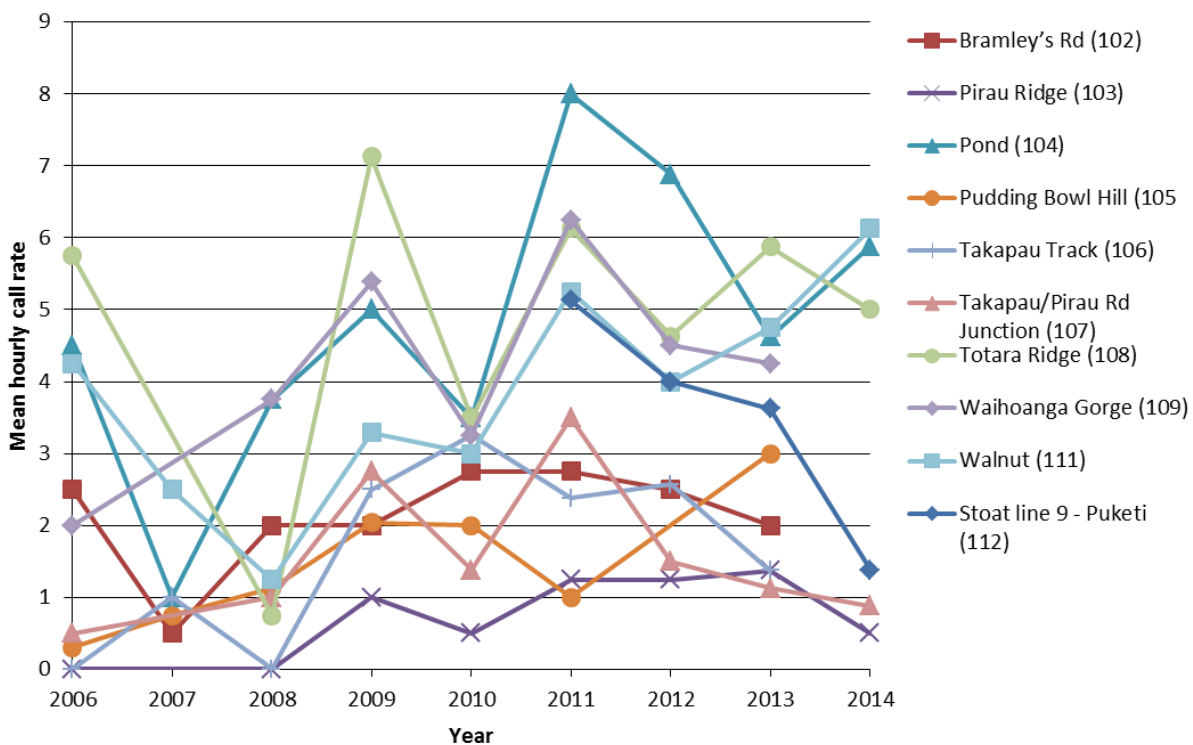


Figure 28. Kiwi call count results for Puketi listening stations (station number in brackets) that have been consistently listened at since 2006

Russell Peninsula

Russell peninsula recorded its highest ever result of 12.83 calls/hr (Figure 29). However two out of the five stations (62 & 173) used to derive the mean weren't listened at and like Puketi Forest above this does have an inflationary effect on the results. The missing result from station 173 (Shortlands) has the greatest effect on the overall mean as this station has a low average since 2005 of 1.67 calls/hr. If this average result and the one from station 62 (10.58 calls/hr since 2000) are included

then the average drops to 10.15 calls/hr. This adjusted figure still indicates however that the Russell peninsula population is doing really well and maintaining its relatively high call rate. The scatterplot and analysis of the trend line confirms that the increasing linear trend is significant ($r = 0.8602$, $n = 10$, $p < 0.001$) and predicts that this management site will reach 20 calls/hr within 10 years (Fig. 30). Great stuff!

A total of eight stations were listened from in this cluster, all for four full nights. As mentioned above, three of these stations were used to derive the mean for this cluster.

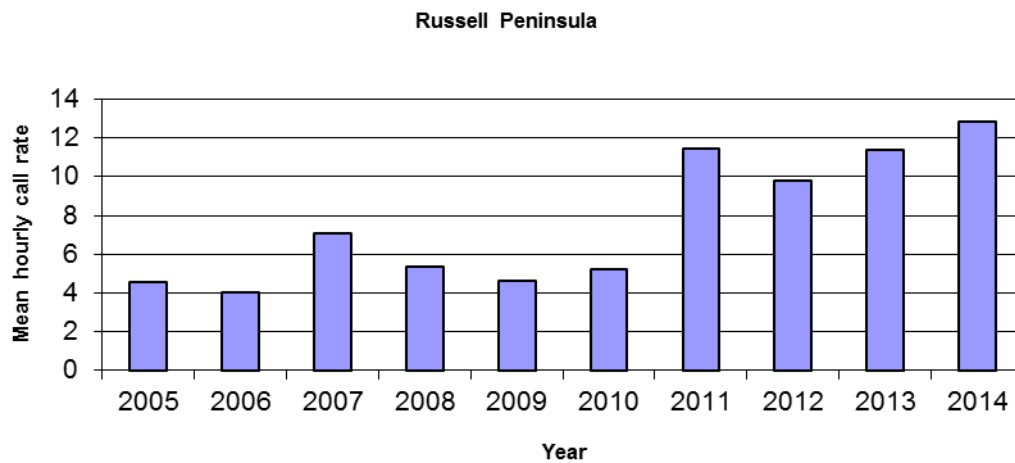


Figure 29. Trends in mean call counts at Russell Peninsula management site

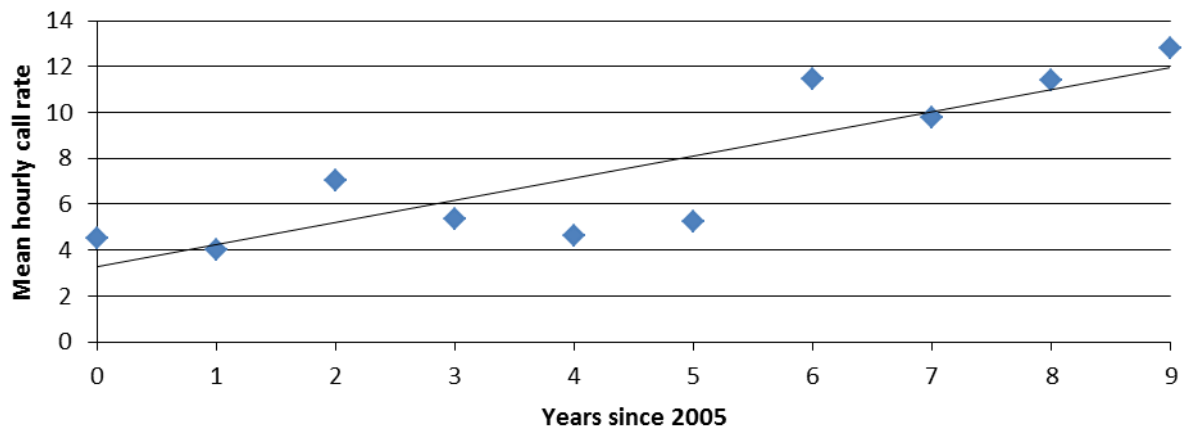


Figure 30. Scatterplot of mean hourly call rate at Russell Peninsula management site from 2005-2014 with trend line ($y = 0.9633x + 2.32$)

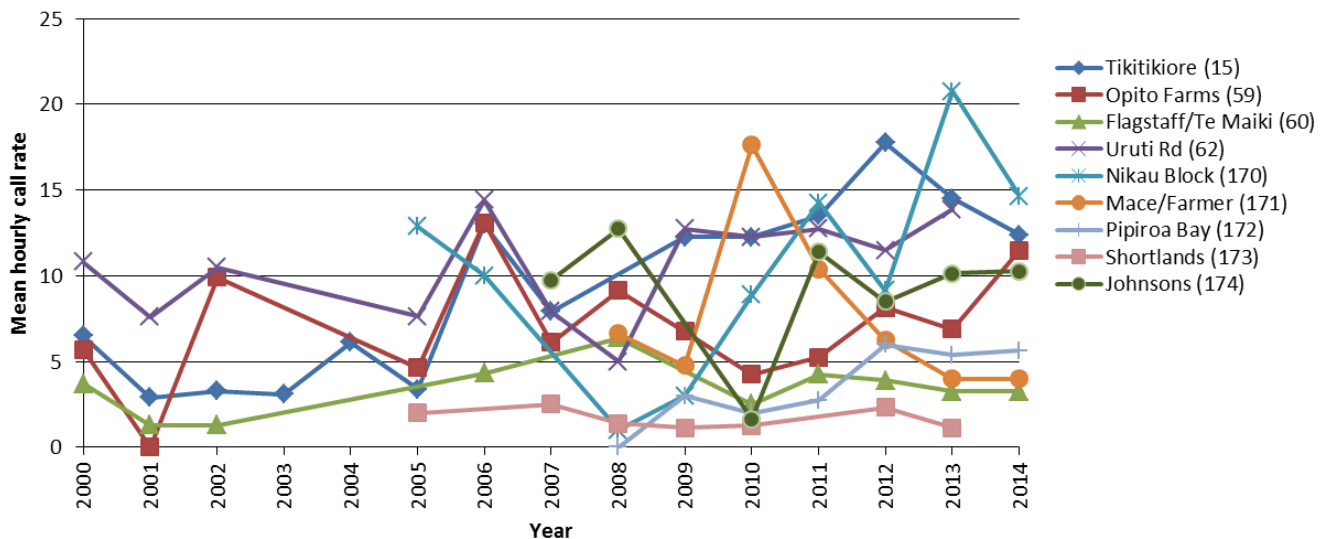


Figure 31. Kiwi call count results for Russell listening stations (station number in brackets) that have been consistently listened at since 2000

5.3 Summary

The Bay of Islands continues to be a stronghold for kiwi on the Kiwi Coast. The inland management sites are doing really well with Puketi showing a strong increasing population trend, Waimate North is maintaining its relatively high call count rates with a stable underlying population and the newly established stations at Hupara are recording impressive kiwi call count numbers. Russell Peninsula and the cluster of original stations that are distributed across this focus area also show an increasing trend. Kiwi listening has been received from Purerua Peninsula stations in the past but no data was received in 2014 and is therefore missing from this report, it would be great to see data from these stations submitted to the Department of Conservation as part of its Northland brown kiwi monitoring in 2015. There is also no data coming in from the Cape Brett Peninsula which would be valuable to start including in the report if listening is currently being carried out there or if it is established in 2015.

6.0 NORTH OF THE BAY OF ISLANDS

6.1 General Trends

There are only two management sites where kiwi listening has been carried out and this does not provide enough coverage to analyse general trends in this focus area.

6.2 Site specific trends

Mahinepua-Radar Hill

The 2014 results showed a slight decline in the mean kiwi call counts for Mahinepua-Radar Hill (5.73 calls/hr in 2014 compared to 6.65 calls/hr in 2013) although it is still the third highest mean call rate on record being beaten only by the two previous years (Figure 32). The relatively high result in 2012 still appears to be the anomaly and the 2014 result fits in with an increasing population trend ($r = 0.644$, $n = 11$, $p = 0.01$; Fig. 33) at this site since 2009 which is very encouraging for this group. With the exception of station 99 (Mahinepua 13) all the stations have very similar call rates and seem to follow the same increasing but fluctuating pattern (Fig. 34).

Six stations were listened at this year, with four nights of listening completed at each station. Five of these stations were used to calculate the 2014 mean call rate.

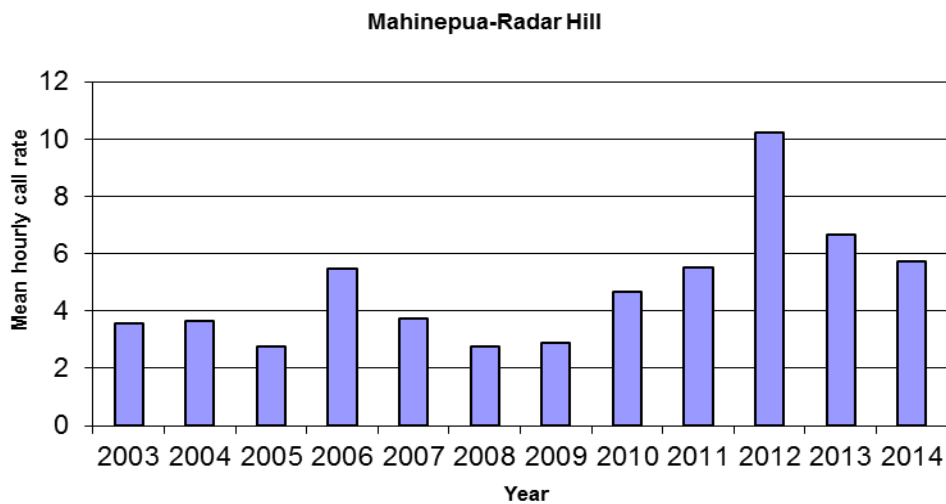


Figure 32. Trends in mean call counts at Mahinepua-Radar Hill management site.

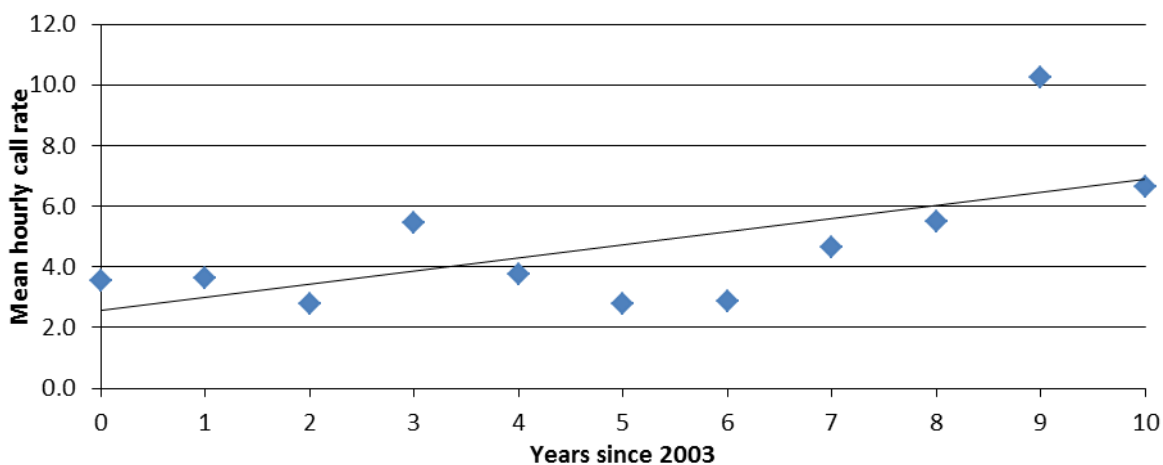


Figure 33. Scatterplot of mean hourly call rate at Mahinepua-Radar Hill management site from 2003-2014 with trend line ($y = 0.4328x + 2.12$)

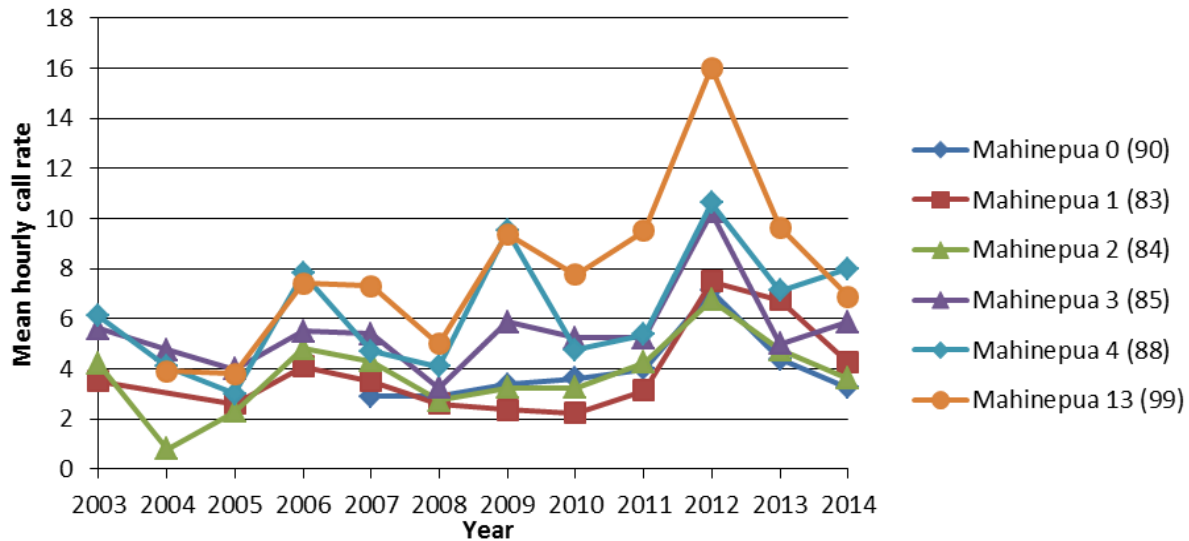


Figure 34. Kiwi call count results for Mahinepua-Radar Hill listening stations (station number in brackets) that have been consistently listened at since 2003.

Whakaangi

The mean kiwi call count rate for Whakaangi has continued on a downward trend for the fifth consecutive year since a peak of 12.23 calls/hr in 2010 (Figure 35). The mean of 6.52 calls/hr for 2014 was derived from seven out of the possible nine stations with the two missing stations (29 and 130) no longer being listened at. In the 2013 DOC Northland Kiwi Call Count Report it was shown that the omission of these stations is not a contributing factor to the decline in the call counts. The negative trend in call rates is statistically significant ($r = 0.701$, $n = 10$, $p = 0.01$; Fig. 36) and we can assume that the adult population at this site is declining likely due to a combination of adult deaths due to recent dog-kill episodes that Whakaangi has experienced and low recruitment rates as suggested by chick monitoring that has been carried out here. All of the Whakaangi listening stations except for station 136 (Whakaangi 8) look to have declining call rates (Fig. 37). Although these results are disheartening Whakaangi are looking at and implementing ways to reverse the decline by utilising the advice and support that is available through DOC and the Northland Kiwi Forum and making improvements to their protection programme where necessary. Let's hope that we see an improvement at Whakaangi in the coming years to reward them for their commitment to their kiwi.

A total of eight stations were listened at in 2014 all of which had four nights of listening except for station 133 which only had two nights. Although not as many stations were listened at in 2014 (15 were listened at in 2013) the ones that were listened at contribute to the annual analysis so thank you Whakaangi listeners for prioritising these sites.

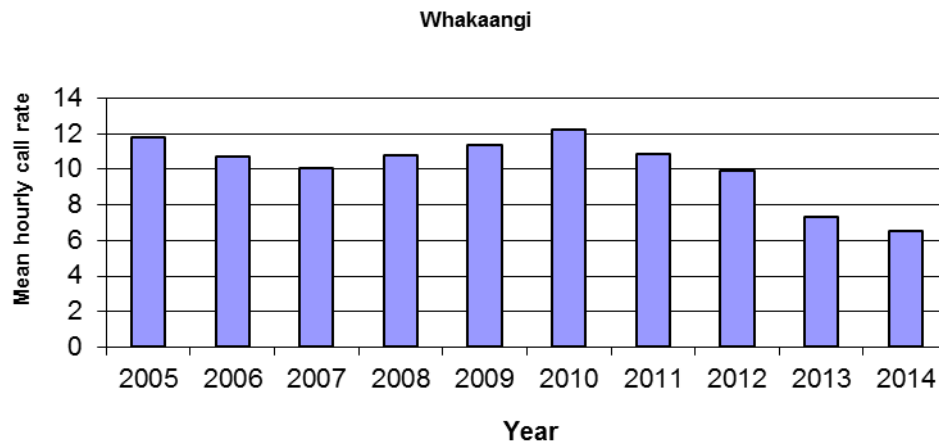


Figure 35. Trends in mean call counts at Whakaangi management site.

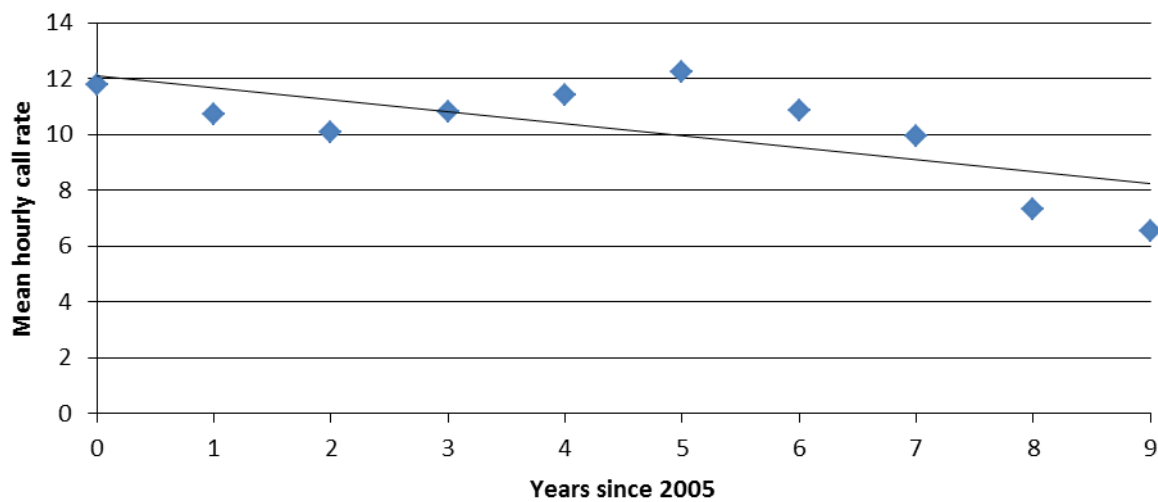


Figure 36. Scatterplot of mean hourly call rate at Whakaangi management site from 2005-2014 with trend line ($y = -0.4297x + 12.10$)

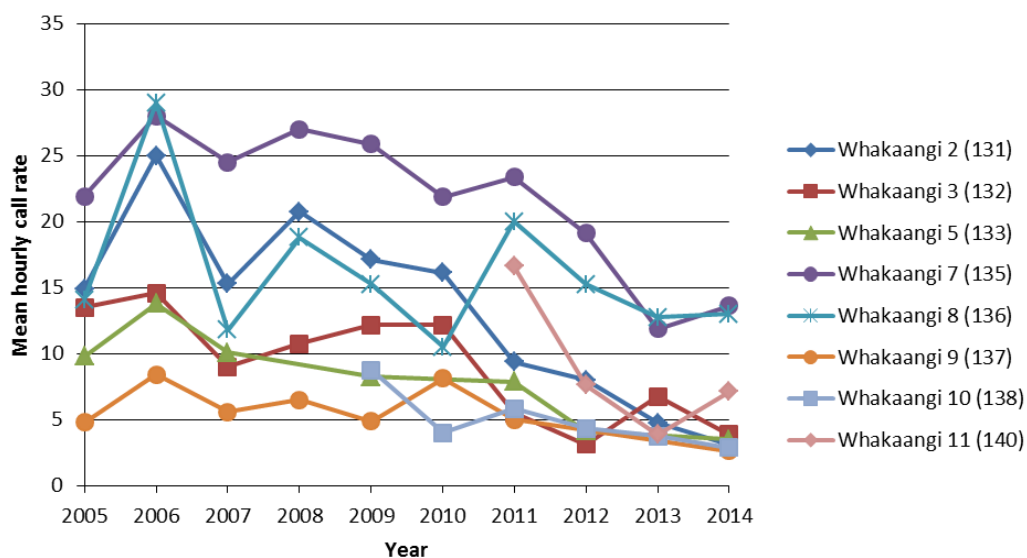


Figure 37. Kiwi call count results for Whakaangi listening stations (station number in brackets) that have been consistently listened at since 2005

6.3 Summary

At the northern end of the Kiwi Coast Whakaangi Landcare Trust and Mahinepua-Radar Hill Landcare are two strong groups that have been a constant in the kiwi recovery scene in Northland for a long time and lead the way in this focus area. The drop in call counts at Whakaangi is concerning for this dedicated group but the slow rate of decline means that they have plenty of time to turn things around, which they are endeavouring to do. The Whakaangi results reiterates the importance of carrying out annual monitoring at management sites as it shows that it is not always safe to assume that a predator control programme will lead to continued population increases and will indicate if there needs to be more investigation into population dynamics and threats at a site.

7.0 GENERAL COMMENT

The purpose of kiwi listening is to monitor long term population trends. The 2014 results from kiwi listening at managed populations within the Kiwi Coast was mixed but analysis of the annual fluctuations as part of the long-term trends showed that all populations at management sites are either increasing or stable with the exception of Glenbervie and Whakaangi.

One improvement that is required for 2015 and beyond is to ensure that the stations that are used to derive the annual call count mean are listened at. The absence of data from the missing stations has meant some results for 2014 are questionable and highlights how important it is for listening to be carried out at all the selected stations to allow for more consistent and accurate reporting. Local kiwi listening coordinators **PLEASE** refer to appendix 3 and check what stations are used in the analysis and prioritise listening to occur at those stations even if they have low kiwi numbers.

It is also important that we still monitor stations where call counts are dwindling or are absent, as those that are growing. If low call rate stations are dropped off and data only comes in from stations with good call rates it will not be a true indicator of what is happening over time.

8.0 KIWI LISTENING 2015

Kiwi listening for 2015 should preferably be carried out from 7 May – 26 May, with a back-up window from 6 June – 24 June.

Information about kiwi listening can be found on the Kiwis for kiwi website <http://www.kiwisforkiwi.org/resources/call-count-monitoring/>.

ACKNOWLEDGEMENTS

Thank you to all the people who carried out kiwi listening in 2014. Participants are listed by station in Appendix 2. Your time and effort in obtaining information about kiwi in your area on those cold winter nights is very much appreciated. Thanks also to local co-ordinators and to Hilary Gardiner for her data entry efforts and all that involves.

APPENDIX 1. Mean call count data for all Kiwi Coast stations 1995-2014.

Stn No.	Station name	1995 Mean	1996 Mean	1997 Mean	1998 Mean	1999 Mean	2000 Mean	2001 Mean	2002 Mean	2003 Mean	2004 Mean	2005 Mean	2006 Mean	2007 Mean	2008 Mean	2009 Mean	2010 Mean	2011 Mean	2012 Mean	2013 Mean	2014 Mean
Whakaangi																					
130	Whakaangi 1	-	-	-	-	-	-	-	-	-	-	9	10.4	4.6	7.6	6.33	-	-	-	-	-
131	Whakaangi 2	-	-	-	-	-	-	-	-	-	-	14.9	25	15.3	20.75	17.13	16.13	9.38	8	4.75	3.13
132	Whakaangi 3	-	-	-	-	-	-	-	-	-	-	13.5	14.6	9	10.75	12.17	12.17	5.5	3.13	6.75	3.88
29	Whakaangi 4	-	-	4.5	-	2.9	1.9	6.25	3.75	4.9	6.6	2.3	6.8	6.3	4.9	5.75	9.83	5	-	-	-
133	Whakaangi 5	-	-	-	-	-	-	-	-	-	-	9.8	13.8	10.1	-	8.25	-	7.88	4.13	-	3.50
134	Whakaangi 6	-	-	-	-	-	-	-	-	-	-	6	7.3	3.9	-	9.5	7	-	-	4.50	-
135	Whakaangi 7	-	-	-	-	-	-	-	-	-	-	21.9	28	24.5	27	25.88	21.88	23.38	19.13	11.88	13.63
136	Whakaangi 8	-	-	-	-	-	-	-	-	-	-	14.1	29	11.8	18.8	15.25	10.5	20	15.25	12.75	13.00
137	Whakaangi 9	-	-	-	-	-	-	-	-	-	-	4.8	8.4	5.6	6.5	4.88	8.13	5	-	-	2.63
138	Whakaangi 10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.75	4	5.83	4.33	3.75	2.88
140	Whakaangi 11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16.63	7.63	3.88	7.13
Mahinepua-Radar Hill																					
90	Mahinepua 0	-	-	-	-	-	-	-	-	-	-	-	-	2.9	2.9	3.38	3.63	4	7.13	4.38	3.25
83	Mahinepua 1	-	-	-	-	-	-	-	-	3.5	-	2.6	4.1	3.5	2.6	2.38	2.25	3.13	7.5	6.75	4.25
84	Mahinepua 2	-	-	-	-	-	-	-	-	4.2	0.8	2.3	4.8	4.3	2.75	3.25	3.25	4.25	6.75	4.75	3.63
85	Mahinepua 3	-	-	-	-	-	-	-	-	5.6	4.75	4	5.5	5.4	3.25	5.88	5.25	5.25	10.25	5.00	5.88
88	Mahinepua 4	-	-	-	-	-	-	-	-	6.1	4.1	3	7.8	4.7	4.1	9.5	4.75	5.38	10.63	7.13	8.00
87	Mahinepua 5	-	-	-	-	-	-	-	-	-	-	-	-	2.4	0.9	2	-	-	-	-	-
86	Mahinepua 6	-	-	-	-	-	-	-	-	1	2.5	2.3	-	0.4	0.75	1.25	-	-	-	-	-
89	Mahinepua 7	-	-	-	-	-	-	-	-	0.9	5.9	1.8	4.8	1.9	0.4	-	-	-	-	-	-
181	Mahinepua 8	-	-	-	-	-	-	-	-	-	-	-	-	0.8	0.4	-	-	-	-	-	-
182	Mahinepua 9	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	-	-	-	-	-	-
183	Mahinepua 10	-	-	-	-	-	-	-	-	-	-	-	-	1.6	1.25	-	-	-	-	-	-
184	Mahinepua 11	-	-	-	-	-	-	-	-	-	-	-	-	2.9	1.25	1.25	-	-	-	-	-
98	Mahinepua 12	-	-	-	-	-	-	-	-	-	3.5	2.3	3.8	2.5	3.4	2.88	-	-	-	-	-
99	Mahinepua 13	-	-	-	-	-	-	-	-	-	3.9	3.8	7.4	7.3	5	9.38	7.75	9.5	16	9.63	6.88

Stn No.	Station name	1995 Mean	1996 Mean	1997 Mean	1998 Mean	1999 Mean	2000 Mean	2001 Mean	2002 Mean	2003 Mean	2004 Mean	2005 Mean	2006 Mean	2007 Mean	2008 Mean	2009 Mean	2010 Mean	2011 Mean	2012 Mean	2013 Mean	2014 Mean
92	Mahinepua 14	-	-	-	-	-	-	-	-	-	-	-	-	0.6	1.25	1.13	1.38	0.75	-	-	-
91	Mahinepua 15	-	-	-	-	-	-	-	-	-	-	-	-	1	1.1	1.63	1.75	3.13	-	-	-
93	Mahinepua 16	-	-	-	-	-	-	-	-	-	-	-	-	1.3	6	2	2.63	5.25	-	-	-
94	Mahinepua 17	-	-	-	-	-	-	-	-	-	-	-	-	2.5	4.9	5	3.38	6.88	-	-	-
95	Mahinepua 18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.75	-	-	-	-	-
Bay of Islands																					
146	Kauri Cliffs 1 (Pink Beach)	-	-	-	-	-	-	-	-	9	-	-	4	4.25	1.75	5	6.5	-	-	-	-
147	Kauri Cliffs 2 (Puriri)	-	-	-	-	-	-	-	-	-	-	-	1.5	3	2.75	1	-	-	-	-	-
10	Marsden Cross	20.9	18.3	9.6	16.7	14.5	19.9	21.9	17.9	18.5	22	19.3	30.6	23	-	20.25	24.5	34.88	30.86	30.25	19.25
148	Wiwiki Beach	-	-	-	-	-	-	-	-	-	-	-	32.1	-	-	-	-	-	-	-	-
149	Mataka Stn Gate, Purerua	-	-	-	-	-	-	-	-	-	-	-	4	4.1	8.25	6.75	18.5	3.25	10	6.88	-
150	McKenzie Rd, Purerua	-	-	-	-	-	-	-	-	-	-	-	9.5	12.1	10.25	5	7.5	-	2.5	-	-
151	Mtn Landing (Lot 30) Purerua	-	-	-	-	-	-	-	-	-	-	-	12.3	10.2	18.75	12.6	25	22.75	20.25	-	-
11	Puketotara	10	13.8	8.1	11.6	9.7	8	-	2.5	7.5	3.6	-	7.1	13.7	10.6	6.17	9.5	9.25	9.13	9.75	14.00
152	Waitoto Block	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-
12	Rangitane	14	5.6	8.4	10.5	7.5	8.4	11.5	10.5	8.6	8	8	11.5	9.1	15.9	15.25	11.38	10.75	12.75	11.25	12.83
153	Aroha Island	-	-	-	-	-	-	-	-	6.88	-	-	12.6	-	-	-	-	-	-	-	-
154	Napia Bay	-	-	-	-	-	-	-	-	-	8.7	5.5	4.6	4	4.5	3.25	5.6	7.5	3.6	4.00	-
155	Stirlings Quarry	-	-	-	-	-	-	-	-	7.3	9.8	13	12.4	10.2	8.3	4	8.5	-	-	-	-
97	Kurapari Rd	-	-	-	-	7.1	-	-	-	12.7	8.8	9.25	10.4	5.5	6	6.75	4.75	2.33	5.5	7.00	-
13	Waitangi No 12	7.6	7.6	6.3	8.9	5.3	7.1	11.5	15.1	18.4	13.75	11.5	15.5	6.3	-	-	-	-	6.75	7.38	3.00
14	Mt Bledisloe	27.1	10.9	5.5	7.9	8.8	5.1	6.4	6.75	4.9	8.9	9.1	5.5	9.6	11.25	8.25	11.38	13.71	7.38	10.75	6.75
138	Hupara	-	-	-	-	-	-	-	-	-	25.6	19.3	27.8	-	-	-	-	-	-	-	-
185	Akeake Reserve, Kerikeri	-	-	-	-	-	-	-	-	-	-	-	-	-	2.75	0.5	-	6.00	-	-	-
186	Cunningham Gardens, Aroha Island	-	-	-	-	-	-	-	10.75	8.63	-	-	-	-	-	-	-	8.17	-	-	-
187	Gaitens, Rangitane Rd, Kerikeri	-	-	-	-	10	-	12.8	6.33	6.88	10	12	12.63	14.7	10.5	8	7.25	7.50	4.75	-	-
188	Blacksmiths Bay (east), Kerikeri (Lex Rennes)	-	-	-	-	-	-	-	10.25	10.3	7.67	8.26	6.20	6	8	4.5	6.88	8.75	6.40	0.00	-
189	Doves Bay, Kerikeri (Lockyer)	-	-	-	-	4.17	-	-	2	-	3.78	2.46	-	-	4.5	7.5	15.25	18.25	-	-	-

Stn No.	Station name	1995 Mean	1996 Mean	1997 Mean	1998 Mean	1999 Mean	2000 Mean	2001 Mean	2002 Mean	2003 Mean	2004 Mean	2005 Mean	2006 Mean	2007 Mean	2008 Mean	2009 Mean	2010 Mean	2011 Mean	2012 Mean	2013 Mean	2014 Mean
190	Rangitu, Opito Bay Road, Kerikeri	-	-	-	-	-	-	-	-	-	-	-	-	9.1	16	15.5	15.5	-	-	-	-
191	Tikorangi Road, Opito Bay, Kerikeri	-	-	-	-	-	-	-	-	-	-	-	-	-	4.5	4.5	4	-	-	-	-
192	Kraus, Hansen Rd, Purerua	-	-	-	-	-	-	-	-	-	3.33	-	-	-	-	11		-	-	-	-
193	Mataka Beach, Mataka Station, Purerua	-	-	-	-	-	-	-	41.5	-	30	39	32.67	24.5	41.75	30	41.25	-	30.83	30.88	-
194	Mataka Station, Ninepin Track, Purerua	-	-	-	-	-	-	-		-	30	-	-	-	50.75	43.5	-	18.00	-	24.00	-
195	Mountain Landing (Lot 30) Wharengaere, Purerua	-	-	-	-	-	-	-	-	-	-	-	12.25	10.2	18.75	12.6	25	22.75	20.25	13.25	-
196	Mountain Landing, Mataka Ridgeline, Purerua	-	-	-	-	-	-	-	-	-	-	-	7.50	10.1	18	25.5	14.25	22.00	-	-	-
197	Mountain Landing, Paddle (Entrance), Purerua	-	-	-	-	-	-	-	-	-	-	-	8.50	10.2	12.5	14.25	17	-	-	-	-
198	Mountain Landing, Poraenui Point	-	-	-	-	-	-	-	-	-	-	-	-	7.3	14.5	16	13.75	-	-	-	-
199	Paoneone	-	-	-	-	-	-	-	16.67	-	-	-	-	-	-	-	-	37.60	-	11.25	-
200	Pattersons Big Hill	-	-	-	-	-	-	-	9	-	-	30.5	-	4.01	20.5	70.25	33	35.50	-	-	-
201	Pattersons, Rocky Bay	-	-	-	-	-	-	-	-	-	-	-	-	-	16.5	19.5	17.67	11.67	-	-	-
202	Tapuaetahi	-	-	-	-	-	-	-	-	-	-	-	5.00	-	3	3.25	16.5		-	7.38	-
203	Wharengaere Bay	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14.5	15.50	-	-	-
204	Wiroa Station	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.5	6.67	-	-	-
205	Wiroa Station Hill 11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.5	-	-	-	-
206	Maintenance Facility, Kauri Cliffs45	-	-	-	-	-	-	-	-	-	-	-	-	-	6.5	5	13.13	-	-	-	-
207	Waiaua Bay, Matauri X	-	-	-	-	-	-	-	-	2.25	-	-	0.5	0.5	-	-	-	-	-	-	-
208	Waterfall, Kauri Cliffs, Takou Bay	-	-	-	-	-	-	-	-	6	-	-	5.5	2.25	4.5	3.5	-	-	-	-	-
209	Hikurua Rd (end)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
212	Drivers Whitehills farm	-	-	-	-	-	-	-	-	-	-	-	-	-	7.5	2	8	8.00	7.88	-	-
213	Landcorp Takou Kiwi covenant	-	-	-	-	-	-	-	-	-	-	-	-	-	8.5	0.75	3	-	-	-	-
214	Maori Block	-	-	-	-	-	-	-	-	-	-	-	-	1.5	-	-	3.5	-	-	-	-
215	Otaha Station (south end)	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	3	-	-	-	-
216	Just past Clinton's	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
217	End of Te Ra Rd	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.25	-	-	-	-

Stn No.	Station name	1995 Mean	1996 Mean	1997 Mean	1998 Mean	1999 Mean	2000 Mean	2001 Mean	2002 Mean	2003 Mean	2004 Mean	2005 Mean	2006 Mean	2007 Mean	2008 Mean	2009 Mean	2010 Mean	2011 Mean	2012 Mean	2013 Mean	2014 Mean
219	Achtzhener, Bulls Gorge, Kerikeri	-	-	-	-	-	-	-	-	-	-	-	7.0	-	6	11.75	5.75	2.75	-	1.88	-
220	Airstrip Rd (Baigent-Mercer)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	3.25	-	-
221	Airstrip Rd (Sharp)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-
222	Candy Bush, Puketi Road, middle ridge	-	-	-	-	-	-	-	-	-	-	-	-	-	0.75	6	-	-	-	-	-
223	Candy Bush, Puketi Road, red cliffs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.5	-	-	5.75	-	-
224	Candy Bush, Puketi Road, white/yellow path	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	-	-	11.00	-	-
225	Kauri Hills, Totara North	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.00	6.25	-	-
226	Poultons, Kerikeri River, Mangaparerua Rd	-	-	-	-	-	-	-	-	-	-	-	-	-	9	-	6.5	-	5.38	4.63	-
227	Puketotara Rd = 709	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-	-	-
228	Puketotara Rd = Kearney	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.5	-	-	-	-
229	Waipapa Rd West, Kerikeri (Anne C.)	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-
230	Waipapa Rd West, Kerikeri (Isabella C.)	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	0.5	-	-	-	-	-
231	Waitoto, 500m west of Rhyolitic dome, Mangaparerua	-	-	-	-	-	-	-	-	-	-	-	4.0	-	-	-	-	-	-	-	-
232	Waitoto, Rhyolitic dome, Mangaparerua Road	-	-	-	-	-	-	-	-	-	-	-	4.5	4.6	8	5	-	-	-	-	-
233	Wharau Rd, Kerikeri (Manning)	-	-	-	-	-	-	-	-	-	-	-	-	3.6	2.5	-	5.5	3.50	4.50	-	-
234	Wharau Rd, Kerikeri (Starr)	-	-	-	-	-	-	-	-	-	-	-	-	6.25	7	-	-	-	-	-	-
Puketi Forest																					
102	Bramley's Rd	-	-	-	-	-	-	-	-	-	-	-	2.5	0.5	2	2	2.75	2.75	2.5	2.00	-
103	Pirau Ridge	-	-	-	-	-	-	-	-	-	-	-	0	-	0	1	0.5	1.25	1.25	1.38	0.50
104	Pond	-	-	-	-	-	-	-	-	-	-	-	4.5	1	3.75	5	3.5	8	6.88	4.63	5.88
105	Pudding Bowl Hill	-	-	-	-	-	-	-	-	-	-	-	0.3	0.75	1.125	2.04	2	1	-	3.00	-
106	Takapau Track	-	-	-	-	-	-	-	-	-	-	-	0	1	0	2.5	3.25	2.38	2.57	1.38	-
107	Takapau/Pirau Rd Junction	-	-	-	-	-	-	-	-	-	-	-	0.5	-	1	2.75	1.38	3.5	1.5	1.13	0.88
108	Totara Ridge	-	-	-	-	-	-	-	-	-	-	-	5.75	-	0.75	7.13	3.5	6.13	4.63	5.88	5.00
109	Waihoanga Gorge	-	-	-	-	-	-	-	-	-	-	-	2	-	3.75	5.38	3.25	6.25	4.5	4.25	-
110	Waihoanga Gorge 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.5	2.5	1.5	-	4.50	-
111	Walnut	-	-	-	-	-	-	-	-	-	-	-	4.25	2.5	1.25	3.29	3	5.25	4	4.75	6.13

Stn No.	Station name	1995 Mean	1996 Mean	1997 Mean	1998 Mean	1999 Mean	2000 Mean	2001 Mean	2002 Mean	2003 Mean	2004 Mean	2005 Mean	2006 Mean	2007 Mean	2008 Mean	2009 Mean	2010 Mean	2011 Mean	2012 Mean	2013 Mean	2014 Mean
112	Stoat line 9 - Puketi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.13	4	3.63	1.38
188	Puketi Nature Trail	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.13	-	3.25	-
Russell Peninsula																					
15	Tikitikiore	10.8	13.5	6.1	6.1	4.5	6.5	2.9	3.3	3.1 (12.3)	6.1 (7.1)	3.38	13	7.9	-	12.25 (5.25)	12.25	13.5	17.75	14.50	12.38
59	Opito Farms	-	-	-	-	-	5.7	-	9.9	-	-	4.63	13.1	6.1	9.13	6.75	4.25	5.25	8.13	6.88	11.50
60	Flagstaff/Te Maiki	-	-	-	-	-	3.7	1.3	1.3	-	-	-	4.3	-	6.38	-	2.5	4.25	3.88	3.25	3.25
62	Uruti Rd	-	-	-	-	-	10.8	7.6	10.5	-	-	7.63	14.4	7.9	5	12.75	12.25	12.75	11.5	13.88	-
61	Milne Ct	-	-	-	-	-	-	-	-	-	-	-	6.3	5.8	-	-	-	-	-	-	-
156	Russell Heights	-	-	-	-	-	-	-	-	-	-	-	9.8	4.8	5	2.5	5	-	-	-	-
171	Mace/Farmer	-	-	-	-	-	-	-	-	-	-	-	-	-	6.63	4.75	17.63	10.38	6.25	4.00	4.00
172	Pipiroa Bay	-	-	-	-	-	-	-	-	-	-	-	-	-	0	3	2	2.75	6	5.38	5.63
173	Shortlands	-	-	-	-	-	-	-	-	-	-	2	-	2.5	1.38	1.13	1.25	-	2.33	1.13	-
170	Nikau Block	-	-	-	-	-	-	-	-	-	-	12.88	10	-	1	3	8.88	14.25	9.13	20.75	14.63
174	Johnsons	-	-	-	-	-	-	-	-	-	-	-	-	9.75	12.75	-	1.63	11.38	8.5	10.13	10.25
176	Jarvis	-	-	-	-	-	-	-	-	-	-	5.38	4.3	-	-	-	-	-	-	-	-
177	Soloman's Gate	-	-	-	-	-	-	-	-	-	-	11.5	6.38	-	-	-	-	5.38	6.25	4.88	14.00
210	Paroa Bay, Russell	-	-	-	-	-	-	-	-	-	-	-	-	4.3	-	-	-	-	-	-	-
211	Eagles Nest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.5	-	-	-	-
Waimate North																					
113	W1	-	-	-	-	-	-	-	-	-	23.5	15.8	24.75	-	-	25.5	25.75	23.63	23.13	23.75	27.13
114	W2	-	-	-	-	-	-	-	-	-	12.25	7	9.5	7.9	11.5	5.75	14.5	11.63	12.5	7.13	5.13
115	W3	-	-	-	-	-	-	-	-	-	14.9	-	-	-	-	-	-	1	0	1.00	1.38
116	W4	-	-	-	-	-	-	-	-	-	9.4	10.5	6	-	8	-	8.5	13.5	10.5	10.88	8.50
117	W5	-	-	-	-	-	-	-	-	-	5.9	1.83	3	-	-	-	-	-	-	-	-
118	W6	-	-	-	-	-	-	-	-	-	22.3	11	5.7	8.5	7.3	9.13	5.63	10.63	8	7.50	10.38
119	W7	-	-	-	-	-	-	-	-	-	-	5.3	6.5	-	3.1	-	-	-	-	-	-
120	W8	-	-	-	-	-	-	-	-	-	13.75	2.83	1	8.1	8	5.5	8.13	9.13	11.88	9.13	11.25
121	W9	-	-	-	-	-	-	-	-	-	5.2	3.5	2.125	2.3	3.5	-	-	-	-	1.00	5.50

Stn No.	Station name	1995 Mean	1996 Mean	1997 Mean	1998 Mean	1999 Mean	2000 Mean	2001 Mean	2002 Mean	2003 Mean	2004 Mean	2005 Mean	2006 Mean	2007 Mean	2008 Mean	2009 Mean	2010 Mean	2011 Mean	2012 Mean	2013 Mean	2014 Mean
122	W10	-	-	-	-	-	-	-	-	-	-	-	7.33	8.3	5.9	5.25	4.13	7.25	5.13	4.13	8.00
123	W11	-	-	-	-	-	-	-	-	-	7.07	7.75	2	-	-	-	-	-	-	-	-
124	W12	-	-	-	-	-	-	-	-	-	18.9	9.75	6.1	3.6	5.9	6	7.88	6.25	4.63	5.13	8.00
178	W13	-	-	-	-	-	-	-	-	-	-	-	-	-	4.5	2.8	-	-	-	-	-
127	W14	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.88	0.5	0	-	-	-
128	W16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.9	2.17	-	-	-	-
Hupara																					
191	Hupara Land Care 1 (Bill's Plateau)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	31.25	15.13	21.38
245	Hupara Land Care 2 (Mike Sullivan's)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20.88	11.00
246	Hupara Land Care 3 (Sue's place)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19.38	-
257	Hupara Land Care 4 (Home Orange Tree)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11.63
Glenbervie																					
21	Glenbervie 7A	5	6.4	7.1	7.5	5	0.5	1	2.4	1	-	1.3	-	2.4	2.5	1.88	1.75	2.63	1.13	4.25	-
22	Glenbervie 9A	11.2	3.8	4.3	7.3	5.9	12.6	6.75	5.25	4.5	6.5	-	1.8	2.8	2.9	1.38	2.88	1.63	6.75	6.88	2.75
Marua – Russell State Forest																					
145	Whangaruru	-	-	-	-	-	-	-	-	-	-	-	6	6	10.25	13.38	10.75	24.29	13.5	9.38	7.75
26	Mimiwhangata	11	5.6	3.5	3.6	0.3	9.4	19.1	20.3	13.8	20.25	14.3	21	19.5	12.9	11	8.38	-	11	9	12.13
167	Kaikanui Rd	-	-	-	-	-	-	-	-	-	-	-	-	8.5	11.6	15	8.38	7.25	3.75	2.88	-
Sandy Bay																					
27	Sandy Bay 1	3.6	3.4	2.8	8	6.1	3.3	3.5	-	3	-	2.5	-	-	6.75	-	5.25	-	4.17	5.5	4.25
194	Sandy Bay 2	-	-	-	-	-	-	-	-	-	-	-	4.5	-	-	3.83	3.5	2.5	4.5	-	3.00
195	Sandy Bay 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	4	7.5	3.88
Whangarei Heads																					
39	Bream Hd 1	-	-	-	-	-	-	5	3.1	5.75	3.1	4.7	5.1	3.5	5	6	3	7.13	9.5	9.63	9.63
40	Bream Hd 2	-	-	-	-	-	-	1.2	2	1.25	2.1	2.4	2	2.8	2	-	-	1.25	-	-	-
41	Bream Hd 3	-	-	-	-	-	-	-	-	-	-	1.5	2	1.3	1.6	-	-	-	8.38	8.63	8.63
42	Bream Hd 4	-	-	-	-	-	-	1.2	2	1.25	2.1	2.4	2	1.5	3.1	2	2	5.38	5.33	7.63	2.13
69	Bream Hd 6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.88	6.75	4.38

Stn No.	Station name	1995 Mean	1996 Mean	1997 Mean	1998 Mean	1999 Mean	2000 Mean	2001 Mean	2002 Mean	2003 Mean	2004 Mean	2005 Mean	2006 Mean	2007 Mean	2008 Mean	2009 Mean	2010 Mean	2011 Mean	2012 Mean	2013 Mean	2014 Mean
44	Taurikura 1	-	-	-	-	-	-	-	-	-	-	1.5	2	-	4.4	4.88	3.13	12.63	9.63	10.75	-
45	Taurikura 2	-	-	-	-	-	-	-	-	-	-	-	-	-	9	8.5	10.88	10.25	5.5	10.38	11.88
46	Taurikura 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.5	1.88	5.88	4.63	4.00	7.50
47	Manaia 1	-	-	-	-	-	-	3.5	2.5	4.25	4	3.3	3.9	2.1	5.1	3.88	3.25	10.25	2.88	2.75	3.63
48	Manaia 2	-	-	-	-	-	-	4	4.5	4.9	5.75	4	5.3	7.4	7.6	8.75	10.75	8.38	16.63	13.25	15.88
49	Manaia 3	-	-	-	-	-	-	3.25	3.9	2.9	-	2.1	3	-	4	3.13	3.5	6.25	3.13	5.13	3.63
71	Manaia 8	-	-	-	-	-	-	-	1.5	0.25	1	1.2	2	1.5	1.4	1.88	0.75	2.13	-	4.63	-
186	Manaia 9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.75	3.63	6.88	9.13
54	Kauri Mtn 1	-	-	-	-	-	-	4.5	1.5	-	3.1	7.4	1.3	-	1.4	3	2.13	2.5	3.63	4.63	4.38
72	Kauri Mtn 2	-	-	-	-	-	-	-	5.1	3.2	4.3	2.7	2.3	0.4	2.25	3.6	2.38	3.38	5.25	5.00	6.25
73	Kauri Mtn 3	-	-	-	-	-	-	-	2	1	1	1.3	2.5	-	5	3.38	1.13	6	3.25	3.17	5.13
74	Kauri Mtn 4	-	-	-	-	-	-	-	4.8	5.9	2.6	3	2.9	-	2	2	3.38	3.88	3.75	3.25	4.13
141	Kauri Mtn 5	-	-	-	-	-	-	-	-	-	-	2.3	1.9	1.25	2.5	3.13	3.25	4.75	4.13	3.00	4.88
127	The Nook 1	-	-	-	-	-	-	-	-	-	1.8	1.5	0.9	-	0.7	1.38	1.25	2.25	-	0.88	-
56	The Nook 2	-	-	-	-	-	-	6	2.1	3.25	3.8	4	5.3	-	5	4.5	7.75	9.25	8.38	6.38	4.13
128	The Nook 3	-	-	-	-	-	-	-	-	-	-	-	-	-	3.4	4.75	5	3.38	3.38	4.63	-
58	Nook Rd	-	-	-	-	-	-	-	-	-	-	-	-	-	3.75	-	3.67	4.63	1.5	-	-
187	McNamaras	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	14.13	12.25	9.25
75	McCleod Bay	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.63
Tutukaka																					
125	TLC 1	-	-	-	-	-	-	-	-	9.75	5.9	7.1	8.8	10.9	11.6	8.13	8.63	12.38	12	12.14	9.63
126	TLC 2	-	-	-	-	-	-	-	-	-	8.4	7.8	9.8	10.25	6.5	-	7.38	2.75	10	-	-
142	TLC 3	-	-	-	-	-	-	-	-	-	-	3	4.6	3.6	3	-	-	9.25	8.5	7.13	5.38
28	TLC 4	-	7.3	-	-	8	4.4	-	-	10.7	7.25	4.4	10	-	-	8.17	4.5	-	-	-	6.50
143	TLC 5	-	-	-	-	-	-	-	-	-	-	4.1	6	3.3	7.1	4	2.33	3.83	-	-	3.50
144	TLC 6	-	-	-	-	-	-	-	-	-	-	9.2	-	13	15.2	6.5	8.75	-	-	-	-
160	TLC 7	-	-	-	-	-	-	-	-	-	-	-	4.4	-	-	4.75	4.88	-	5.5	2.13	3.00

APPENDIX 2. Summary of Kiwi Coast kiwi listening data for stations listened from in 2014.

Stn. No.	Station name	Listener	1		2		3		4		Total	Mean
			1	2	1	2	1	2	1	2		
Whakaangi												
131	Wha 2	B. Smith	4	3	6	1	3	0	2	1	20	2.50
132	Wha 3	B. Collett	8	2	3	1	5	1	5	6	31	3.88
133	Wha 5	D. Walsh	2	2	5	5	-	-	-	-	14	3.50
135	Wha 7	W. Sporle	20	8	22	12	11	10	14	12	109	13.63
136	Wha 8	P.L. & P.J. Johnston	11	13	9	12	16	14	14	15	104	13.00
137	Wha 9	A. Goodwin	0	2	4	3	5	2	4	1	21	2.63
138	Wha 10	I. Mateer	3	5	2	1	5	2	4	1	23	2.88
140	Wha 11	M. & J. Landridge	12	6	6	7	12	4	5	5	57	7.13
Glenbervie												
21	Glenbervie 7A	T. & S. Howard	1	0							1	0.50
22	Glenbervie 9A	A. Jackson	5	1	0	3	0	0	8	5	22	2.75
Marua – Russell State Forest stations												
145	Whangaruru	T. Grant	12	7	10	7	12	9	2	3	62	7.75
26	Mimiwhangata	R. Taylor	6	13	11	11	20	16	9	11	97	12.13
Sandy Bay												
27	Sandy Bay 1	N. Pullman	2	2	6	1	5	9	3	6	34	4.25
194	Sandy Bay 2	N. Pullman	3	5	6	2	3	1	1	3	24	3.00
195	Sandy Bay 3	N. Pullman	5	8	1	1	3	12	1	0	31	3.88
Mahinepua												
90	Site 0	C. Pusch/R. Wright <i>et al.</i>	7	2	2	4	5	5	1	0	26	3.25
83	Site 1	J. Hill/V. Wright/D. Brown	8	3	1	3	11	7	1	0	34	4.25
84	Site 2	M. Cox/M. Woodworth <i>et al.</i>	7	3	2	2	9	2	2	2	29	3.63
85	Site 3	P. Williams/D. Hayman	7	8	8	2	5	3	14	0	47	5.88
88	Site 4	A. Herbert <i>et al.</i>	4	11	7	6	7	9	17	3	64	8.00
99	Site 13	F. Barnes Jr/R. Corrie	5	4	10	7	7	6	15	1	55	6.88
Hupara												

Stn. No.	Station name	Listener	1		2		3		4		Total	Mean
			1	2	1	2	1	2	1	2		
191	Hupara Land Care 1 (Bill's Plateau)	W. & S. Atkinson <i>et al.</i>	11	24	29	21	23	33	25	5	171	21.38
245	Hupara Land Care 2 (Mike Sullivan's)	W. & S. Atkinson/S. Brown	16	17	16	5	4	7	12	11	88	11.00
257	Hupara Land Care 4 (Orange Tree)	W. & S. Atkinson/S. Brown	6	11	10	9	15	5	15	22	93	11.63
Waimate North												
113	W1	P. Saunders/I. Kerr/D. Way	38	24	35	31	29	18	22	20	217	27.13
114	W2	L. Mountain/B. Wards	4	7	6	8	5	6	2	3	41	5.13
115	W3	A. Taylor/K. Taylor/F. Taylor	1	6	0	3	0	0	1	0	11	1.38
116	W4	H. Horrobin	10	18	2	13	4	6	14	1	68	8.50
118	W6	D. Way/C. Matthews/P. Jones	9	7	13	12	7	10	11	14	83	10.38
120	W8	A. Chiaroni/J. Blakey/D. Way	19	16	6	14	8	3	8	16	90	11.25
121	W9	B. Brown	6	15	2	6	1	1	6	7	44	5.50
122	W10	D. Liebert/N. Moore	6	7	4	13	14	7	7	6	64	8.00
124	W12	L. Fletcher/J. Tood <i>et al.</i>	7	2	8	11	12	10	5	9	64	8.00
Whangarei Heads												
39	Bream Head 1	W. Newbold	11	9	12	13	5	5	8	14	77	9.63
41	Bream Head 3	O. Petel	7	10	8	11	9	7	5	12	69	8.63
42	Bream Head 4	M. & C. Pearson	1	4	1	3	4	1	2	1	17	2.13
69	Bream Head 6	C. Cook	3	5	4	3	7	5	5	3	35	4.38
54	Kauri Mt 1	J. Nairn	0	4	5	4	4	5	7	6	35	4.38
72	Kauri Mt 2	M. Barteldres	5	4	4	12	11	8	3	3	50	6.25
73	Kauri Mt 3	T. Bull	2	5	2	6	14	7	4	1	41	5.13
74	Kauri Mt 4	G. Faber	8	3	2	3	5	9	3	0	33	4.13
141	Kauri Mt 5	L. Brown	2	1	5	4	9	0	11	7	39	4.88
47	Manaia 1	U. Schmid	2	2	11	1	1	2	7	3	29	3.63
48	Manaia 2	T. Hamilton	21	10	31	7	18	13	19	8	127	15.88
49	Manaia 3	P. Richards	5	1	3	4	4	4	6	2	29	3.63
186	Manaia 9	J. Williams	12	9	8	5	10	8	10	11	73	9.13

Stn. No.	Station name	Listener	1		2		3		4		Total	Mean
			1	2	1	2	1	2	1	2		
56	Nook 2	P. Coates/P King <i>et al.</i>	2	4	4	2	7	3	6	5	33	4.13
45	Taurikura 2	G. Pike	9	14	13	14	9	7	16	13	95	11.88
46	Taurikura 3	K. Lange	11	7	11	5	11	4	8	3	60	7.50
187	Craig Rd	C. & J. McNamara	3	14	6	7	9	5	16	14	74	9.25
75	McLeod Bay	W & V Biddle	15	4	17	6	11	3	15	6	77	9.63
Tutukaka												
125	TLC 1	M. Camm	8	11	5	11	7	16	6	13	77	9.63
142	TLC 3	A. & J. Gilbert	8	2	11	1	6	3	4	8	43	5.38
28	TLC 4	S. Seitzer	7	12	6	9	7	1	4	6	52	6.50
143	TLC 5	K. Watzig	4	2	4	4	4	2	4	4	28	3.50
160	TLC 7	N. Shayer	8	0	2	4	4	2	3	1	24	3.00
Bay of Islands original stations												
10	Marsden Cross	A. Hosted/B. Hunt	30	20	18	18	20	7	18	23	154	19.25
14	Mt Bledisloe	S. M. McManus	5	11	16	0	11	5	3	3	54	6.75
11	Puketotara	A. Mentor/A. Kearney	17	11	10	12	14	14	14	20	112	14.00
13	Waitangi No. 12	M. Douglass	3	2	2	5	1	3	3	5	24	3.00
12	Rangitane	A. Walker	14	11	13	10	9	20	-	-	77	12.83
Puketi Forest												
103	Pirau Ridge	V. & C. Miller <i>et al.</i>	1	1	1	1	0	0	0	0	4	0.50
104	Pond	A. & S. Mentor <i>et al.</i>	5	10	6	8	7	6	3	2	47	5.88
107	Takapau/Pirau Rd Jn	I. & D. Godbert <i>et al.</i>	2	1	1	0	1	1	1	0	7	0.88
108	Totara Ridge	B. & L. Holliday <i>et al.</i>	7	5	8	1	7	2	7	3	40	5.00
111	Walnut	M. Young/T. Ricketts <i>et al.</i>	4	14	3	5	4	5	8	6	49	6.13
112	Stoat line 9 - Puketi	A. Linton <i>et al.</i>	3	2	3	2	0	0	1	0	11	1.38
7	Puketi	D. O'Halloran	4	9	3	4	8	3	12	4	47	5.88
8	Puketi SR	K. Aukett/S. Grimme	11	9	6	10	10	3	3	9	61	7.63
Russell												
59	Opito	E. Harwoord	12	16	9	13	9	10	12	11	92	11.50
15	Tikitikiore	L. Gordon	23	11	11	21	16	0	7	10	99	12.38
170	Nikau Block	L. Gordon	17	16	23	6	23	9	15	8	117	14.63

Stn. No.	Station name	Listener	1		2		3		4		Total	Mean
			1	2	1	2	1	2	1	2		
171	Mace/Farmer	T. Klee	5	4	5	1	3	1	7	6	32	4.00
172	Pipiroa	M. Pasco	6	5	6	5	2	2	16	3	45	5.63
60	Te Maiki/Flagstaff	H. Lindauer	4	1	3	2	4	5	3	4	26	3.25
174	Johnsons	M. Frankum	15	6	8	7	13	8	17	8	82	10.25
177	Solomon's Gate	L. Collins	10	8	18	19	22	7	17	11	112	14.00

APPENDIX 3. Mean kiwi call count rates from annual monitoring of selected stations at managed Northland kiwi populations

Area	No. of Stn	Selected station numbers used to calculate mean	Stations listened to in 2014 and used to calculate mean	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Whakaangi	7-9	29, 130-137	131-137	-	-	11.80	10.70	10.10	10.80	11.68	12.23	10.88	9.93	7.33	6.52
Mahinepua-Radar Hill	8	83-85,87-89,98,99	83-85,88,99	-	3.60	2.80	4.90	2.70	1.90	2.46	4.65	5.50	10.23	6.65	5.73
Waimate North	5	114, 118, 120, 122, 124	114, 118, 120, 122, 124	-	10.46	4.28	-	6.80	6.48	4.68	8.05	8.98	8.43	6.6	8.55
Puketi Forest	6	102, 104-106, 108, 111	104, 108, 111	-	-	-	2.88	1.15	1.48	3.66	3.00	4.25	4.11	3.6	5.67
Bay of Islands original stations*	6	10 - 15	10-15	10.17	10.39	11.98	13.87	11.60	12.58	11.66	13.75	16.42	14.10	13.98	11.37
Russell Peninsula	5	15, 59, 62, 170, 173	15, 59, 170	-	-	4.53	4.01	7.04	5.35	4.61	5.54	11.44	9.77	11.4	12.83
Tutukaka	5	125, 126, 142, 143, 144,	125, 142, 143	-	-	6.24	7.30	8.21	8.68	5.67	6.77	7.05	10.17	9.63	6.17
Sandy Bay	3	27, 194, 195	27, 194, 195								3.25	-	4.22	4.33	3.71
Glenbervie Forest*	2	21, 22	22	2.8	6.5	1.3	1.8	2.6	2.7	1.6	2.3	2.1	3.9	5.6	2.88
Manaia-Nook	5	47-49,56,71	47-49,56,71	3.10	3.50	2.90	3.90	-	4.60	4.43	6.31	7.25	7.75	6.43	6.81

Area	No. of Stn	Selected station numbers used to calculate mean	Stations listened to in 2014 and used to calculate mean	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Kauri Mountain	5	54,72-74,141	54,72-74,141	-	-	3.30	2.20	-	2.60	3.02	2.45	4.10	4.00	3.83	4.95
Bream Head- Taurikura	5	39, 41, 42, 44, 69 (69 added in 2012)	39, 41, 42, 69	-	-	2.50	2.60	2.20	3.20	4.29	2.70	6.59	7.14	8.68	6.19
<p>Note: In previous reports up to 2009: where a single station was not covered, the previous year's results were used. However, some of the stations had not been listened from for several years, so the mean call count rates for the data from 2010 and beyond were calculated only from the relevant stations listened from for that year.</p> <p>*Data goes back to 1995 but only data from 2003 can be included in this table due to space and formatting restrictions</p>															