

Analysis of 2025 Rabbit Night Counts

2025 Night Count Routes

- [1] In 2025, 31-night count routes were monitored (Figure 1). Of the 31 routes, 15 are a continuation of historic routes (data from, at least, 2006) with 15 new routes added in 2023 and one new route added in 2024 as part of the expansion under the Rabbit Monitoring Programme. The routes used in 2025 were the same as those used in 2024.

Rabbit Night Count Routes 2025

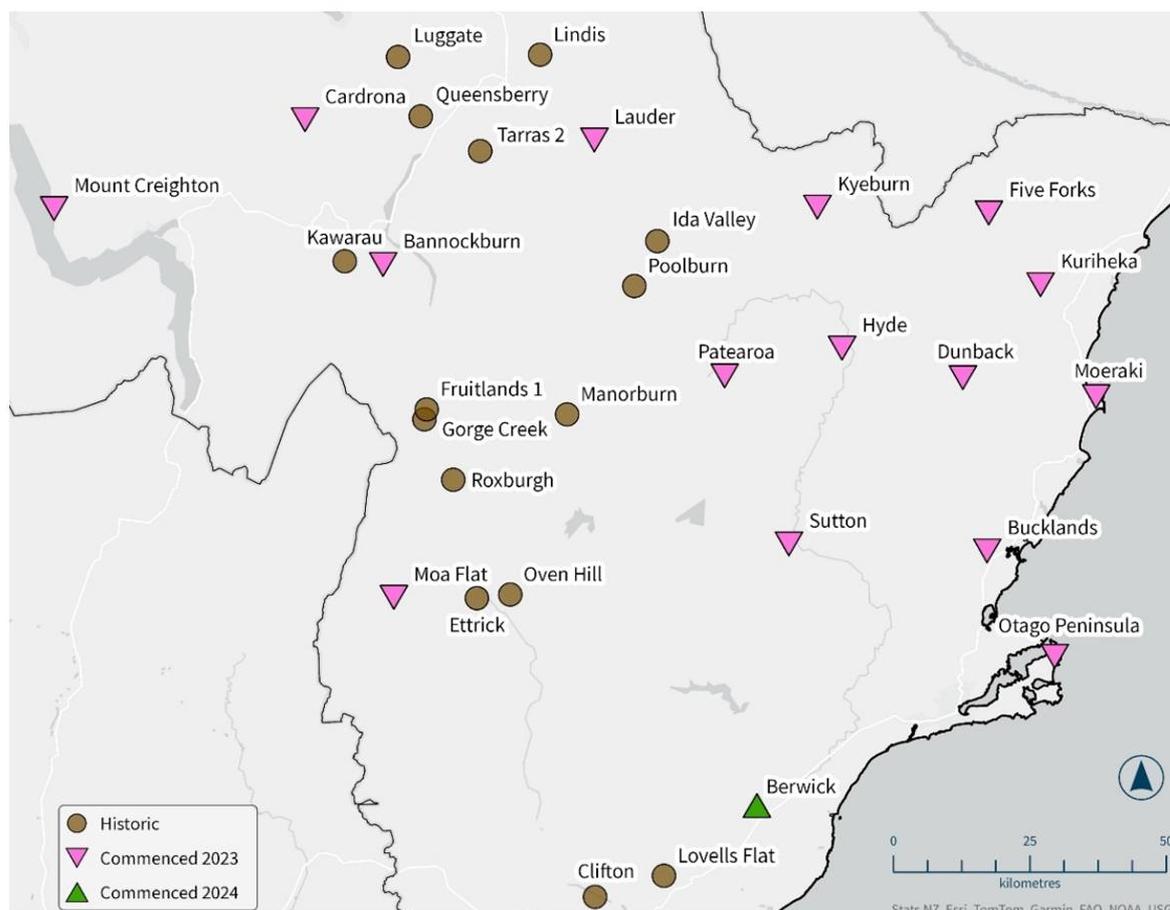


Figure 1: Rabbit night count routes locations in 2025

- [2] All 31 routes were monitored in July or August 2025. The winter/early spring timing provides a baseline count of rabbit densities to enable a more consistent assessment of prevalence that is less affected by birth driven populations which can distort spatial comparisons in other seasons.
- [3] The night count routes are located in rural (farmed) areas. Any inference from this analysis only applies to similar areas. Due to methodology of night counts, they are not appropriate in semi-rural and peri-urban areas (e.g. lifestyle blocks). Different methods are being trialled to assess the prevalence of rabbits in these areas (e.g. trail cameras, inspection data).
- [4] The night count routes range from 11 km to 29 km in length, with an average length of 15.1 km. The combined route length for 2025 was 468.4 km. To aid counting, each route is divided into

sections (sectors), with each section being nominally one kilometre long.¹ A total of 473 sectors were counted in 2025. There were three fewer sections than 2024, due to temporary changes in land use (cropping) and weather (fog).

2025 Results

- [5] The rabbit density ranged from zero rabbits per kilometre (on one route) to a maximum of 15.8 rabbits per km on one route (Berwick) (Figure 2).

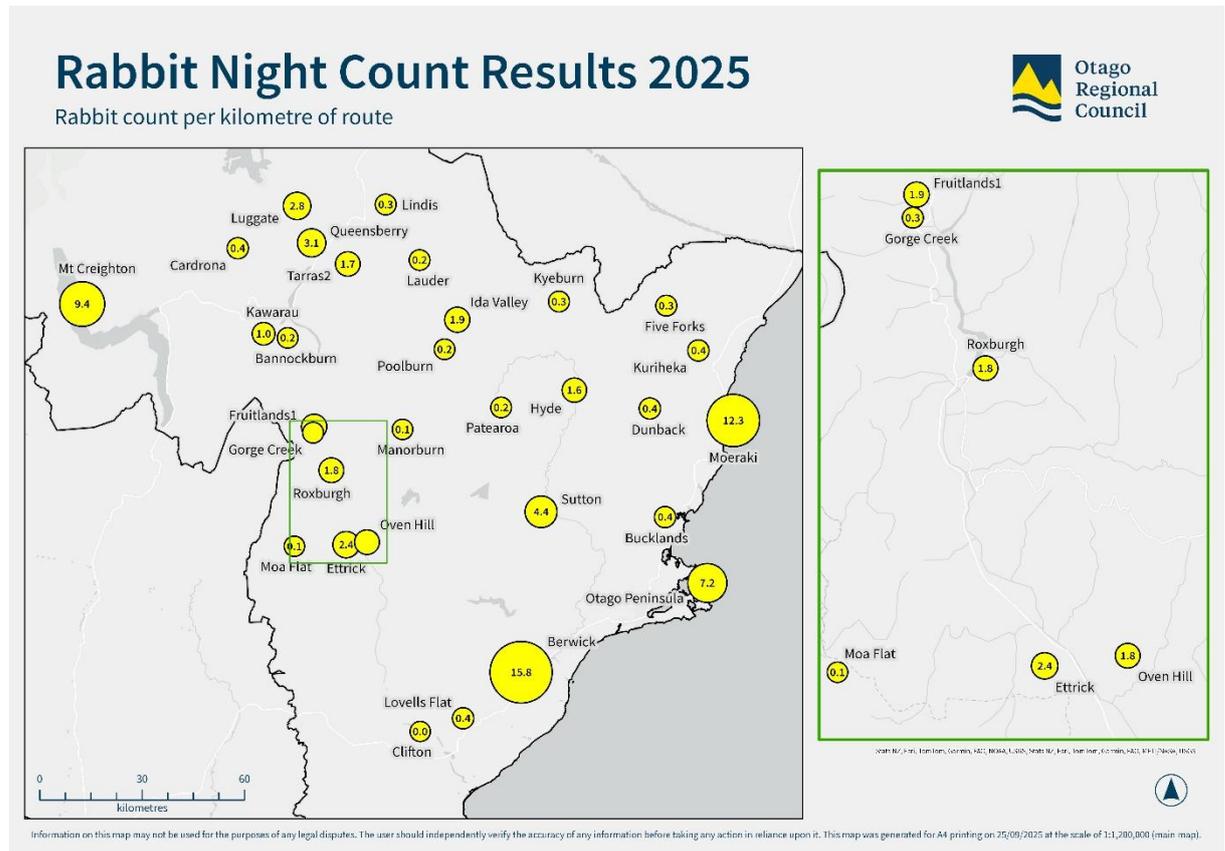


Figure 2: Rabbit density (rabbits per km) by night count route in 2025

- [6] Overall, the average rabbit density per route is **2.4 rabbits per km**. However, the median rabbit density per route is only **0.4 rabbits per km**. This difference highlights the marked skewness of rabbit populations, which is dependent on, and varies by, location.
- [7] Under the Otago Regional Pest Management Plan, the maximum permissible level of rabbit prevalence is set at Level 3 on the Modified McLean Scale (MMS). As classified by Bolton (2010), an MMS of Level 3 equates to, approximately, a rabbit density of five rabbits per km. Based on this relationship, some 27 routes (87%) have a baseline rabbit density at or under the compliance level of MMS 3.
- [8] In 2025, four routes had a rabbit density of five rabbits/km or greater: these being, Berwick, Moeraki, Mt Creighton and Otago Peninsula (Figure 3).

¹ This is a nominal (average) length, and most sections range between 900 to 1,100 metres. For operational reasons, some sections may sit outside this range.

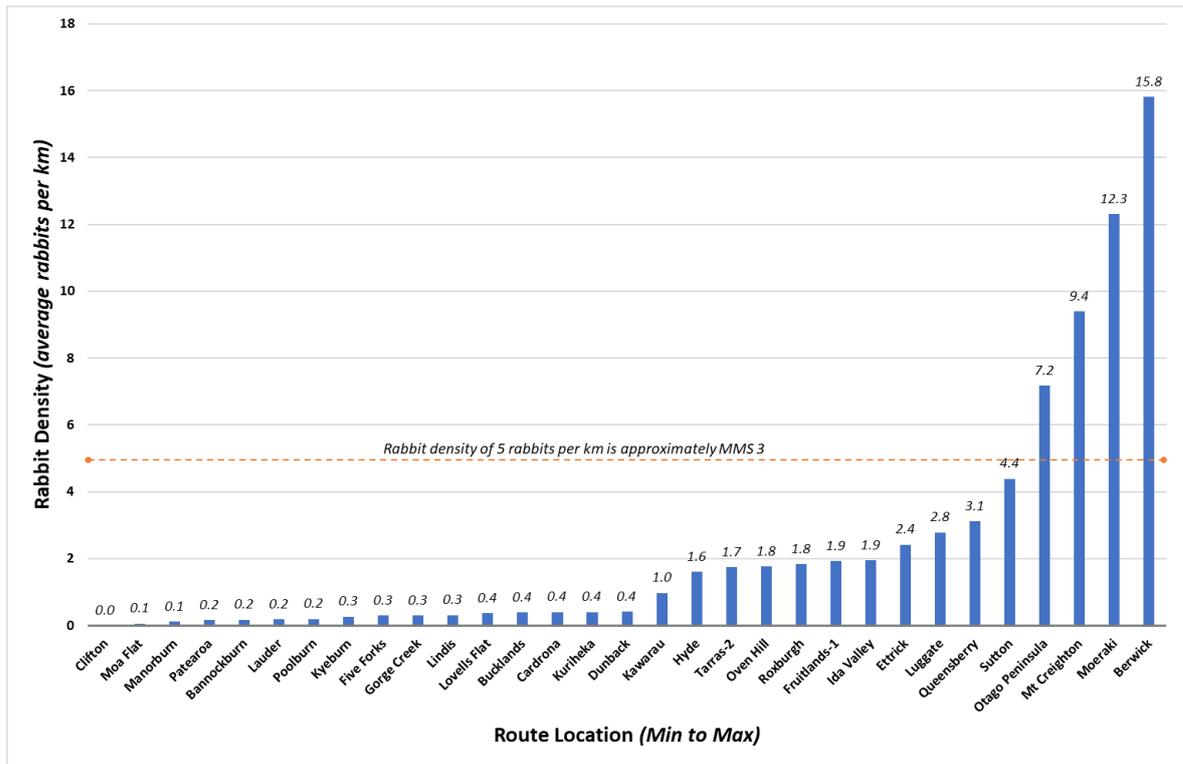


Figure 3: Average Rabbit Density for each Night Count Route in 2025

[9] Of the 473 sectors counted, no rabbits were observed in 270 sectors (57.0%). The distribution of rabbits is consistent with historical sectional data where approximately half of the sections surveyed were free of rabbits between the period from 2006-2025. Only 58 sections (12.3%) had a rabbit count of five rabbits or greater (Figure 4). This highlights, again, the large skewness of rabbit prevalence (sector skewness = 4.3).

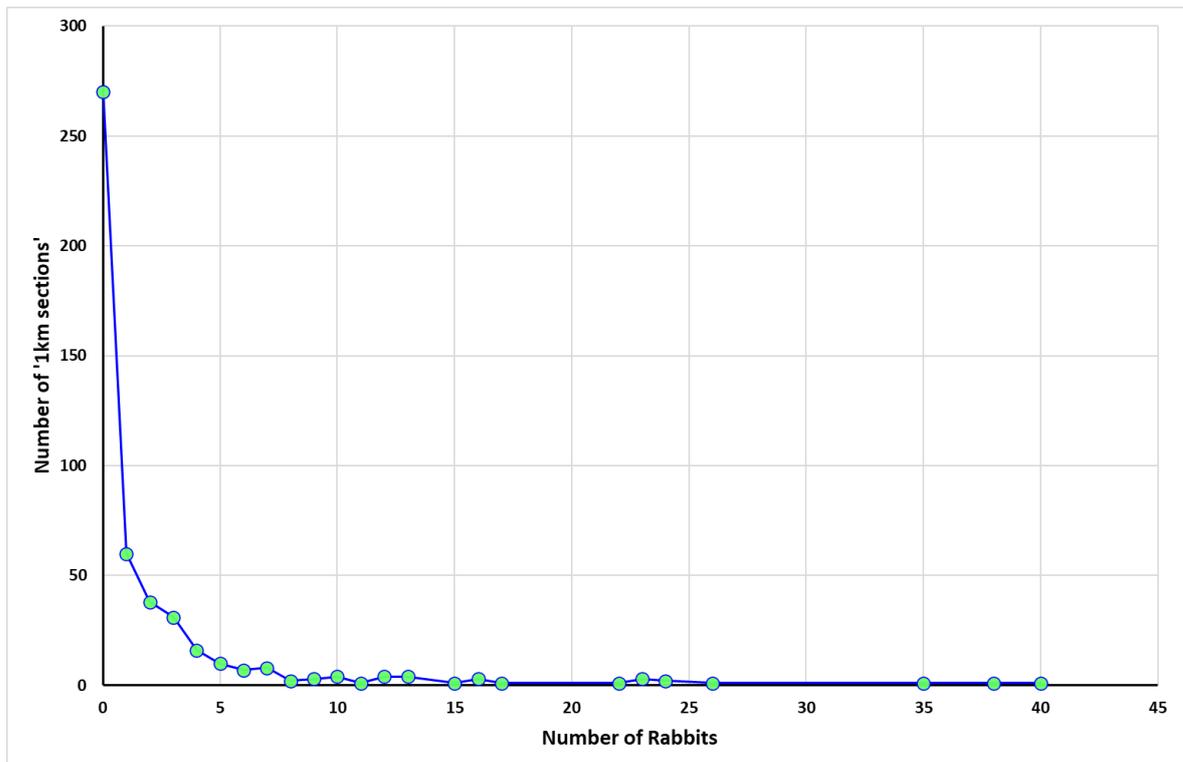


Figure 4: Number of rabbits per '1 km sections' in 2025

- [10] Given the high skewness and the high proportion of sectors with zero counts, it is reasonable to conclude that – overall – baseline rabbit densities are generally low across rural farmed land in Otago. The interpretation of low is that, for any random 1 km section of farmed land, rabbit densities are more likely than not to be at, or less than, the compliance level of MMS 3.
- [11] As an approximate assessment, baseline rabbit densities that exceed compliance level of MMS ≥ 4 occurs on, around, 15% of the farmed land in the Otago region. However, the areas with high rabbit densities still present a considerable challenge to manage and control. Furthermore, it is important to note the variance *within* some of the routes shows very localised pockets of high rabbit populations. This strengthens the observation that rabbit densities are highly dependent on spatial location hence are likely to require a more targeted approach to control.

Comparison with previous night count data

- [12] Overall, the 2025 results showed a notable decrease in rabbit density in recent years with an **average of 2.4 rabbits per km** and a **median of 0.4 rabbits per km**. In comparison, the 2024 average and median densities per route were 3.9 rabbits per km and one rabbit per km respectively (the 2023 values were the same as 2024).
- [13] Significant decreases in rabbit densities were observed in Ettrick, Luggate, Queensberry and Tarras 2 (Figure 5). In contrast, notable increases were observed in Mt Creighton and Otago Peninsula with minor increases in Berwick, Sutton and Fruitlands-1. The large change at the Ettrick route is not treated as an outlier. Rather this is the response to intensive control activities undertaken in late winter of 2024 to reduce the high rate of rabbit prevalence during 2023-2024.

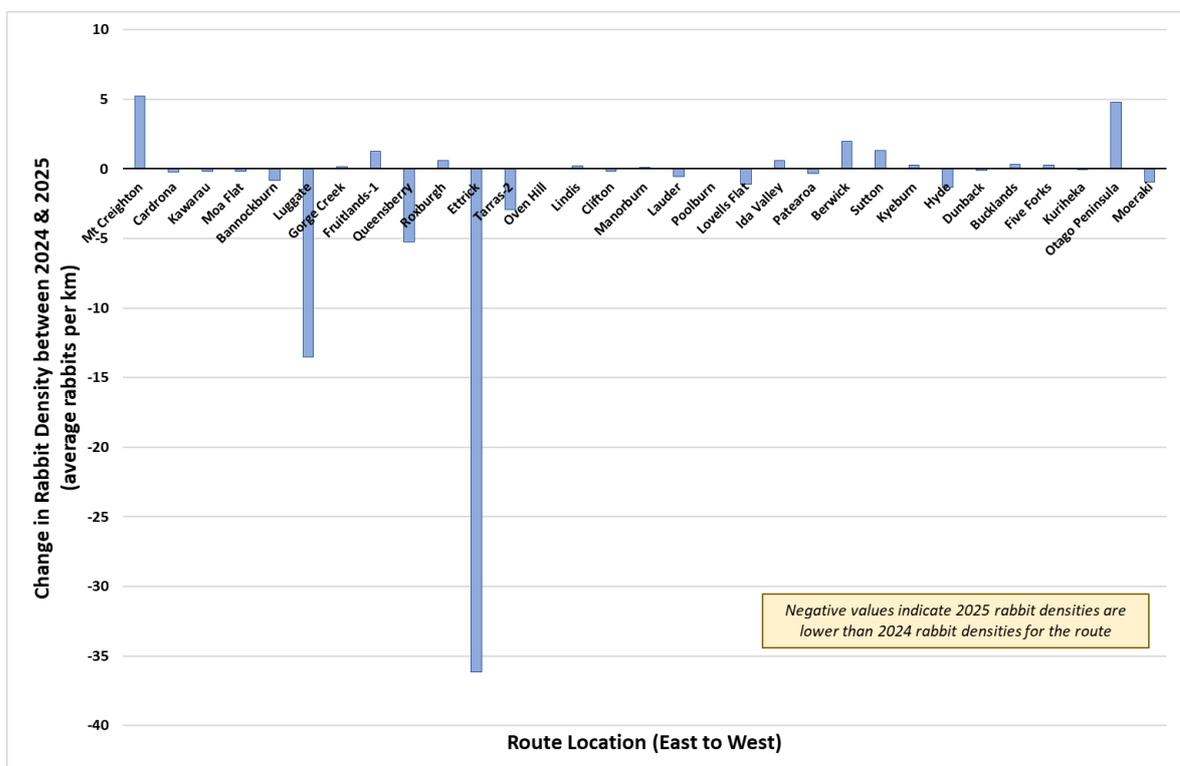


Figure 5: Change in rabbit density by route between 2024 and 2025

- [14] Undertaking a paired analysis of the 31 routes, 16 routes (52%) showed a decrease in the rabbit density compared to 2024. The average decrease over these 16 routes was 4.0 rabbits per km. For the remaining 15 routes (48%), there was an increase in rabbit densities of 1.1 rabbits per km. When combined, this amounted to an average decrease of 1.5 rabbits per km across the region.

- [15] At a sector level, the decreases are more pronounced. The maximum count for any one sector in 2025 was 40 rabbits at Berwick. This is down from a sector maximum of 103 rabbits in 2024 at Ettrick. Furthermore, in 2025 there were 58 (12.3%) sectors with five or more rabbits compared to 80 (16.8%) sectors in 2024 (Table 1).

Table 1: Changes in sector counts between 2024 & 2025

Year	2024	2025
Total Sectors	476	473
Sectors with no rabbits	276 (58.0%)	270 (57.0%)
Sectors with 5 or more rabbits	80 (16.8%)	58 (12.3%)

- [16] In previous night count analysis, a dominant observation has been that Central Otago was seen to be the primary area for rabbit infestations, especially in the Queensberry/Luggate corridor and Ettrick areas. However, the 2025 night count analysis presents a changing picture. Notable decreases in rabbit densities have occurred in Ettrick, Luggate, Queensberry and Tarras 2. A key observation from the analysis from the 2025 night counts is that rabbit infestations are increasing on the coastal areas of Otago and not confined, as often assumed, to central Otago. It is worth noting that of the highest five rabbit densities, four are located on the coastal areas (Berwick, Moeraki, Otago Peninsula and Sutton). This suggests that, given the rise of rabbit hotspots in coastal areas, there needs to be a greater strategic and implementation focus.
- [17] Looking further back into historical night count data from the 1990s, route averages commonly exceeded 20 rabbits per km. Current rabbit densities are now manifestly lower. This is not often acknowledged. One example stands out – the Manorburn route (Galloway Station). In 1996, this area had rabbit densities exceeding 90 rabbits per km. As can be seen by the historical trend (see Appendix 1), rabbit densities for this route have decreased to a 20-year average of 0.1 rabbits per km. There is a need to reflect on, and publicise, progress that has been made to sustainably control rabbit populations.

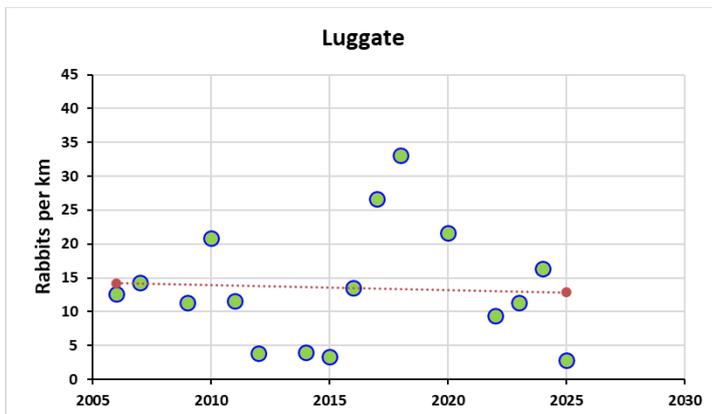
Summary

- [18] In 2025, rabbit densities reduced to **2.4 rabbits per km** (route average) and **0.4 rabbits per km** (route median) compared, respectively, to 2024 values of 3.9 rabbits per km and 1 rabbit per km.
- [19] There was a notable decrease in the maximum rabbits by sector. In 2025, the sector with the maximum count was 40 rabbits which compares to 103 rabbits in one sector in 2024.
- [20] While the changes cannot, yet, be said to be significantly different, most of the measures are going in the right direction. Overall, this analysis provides pragmatic evidence that there is positive progress towards the **sustainable control**² of rabbits as required under the Otago RPMP.
- [21] However, while rabbit densities have decreased across central Otago, there has been an increase along coastal Otago. Acknowledging this trend should be reflected in changes to strategies and the need for more compliance inspections to be undertaken in coastal areas.
- [22] Given the decrease in rabbit density as seen in the 2025 night counts, it would be essential to commit to the 2026 night count programme to confirm if this is a persistent decreasing trend. Also, it is worth considering the idea to randomly select a series of ad hoc routes as a method to confirm the findings presented in paragraphs [10] and [11].

² As *distinct* from other pest management objectives of exclusion, eradication and progressive containment.

Appendix 1: Trend Analysis of Rabbit Night Count Routes (2006-25)

- [1] Trend analysis was undertaken on the 15 historic night count routes that have at least five years of continuous data. The trend analysis for these routes is updated and given below. Trend analysis was undertaken using TimeTrends software.
- [2] Trend analysis for the new routes will be undertaken once there is at least five years of continuous data (expected in 2027).
- [3] Of the 15 routes, nine showed a decreasing trend, four had an increasing trend with two routes having no discernible trend. For most routes, there was a low confidence in having a meaningful trend whether decreasing or increasing. Three routes (Lindis, Poolburn and Roxburgh) showed a ‘virtually certain’ decreasing trend. Of the routes with increasing trends, only the Oven Hill route showed a ‘likely’ increase. However, the trend for this route is likely to be sensitive to small changes given the low rabbit density (average of 1 rabbit per km over 20 years).
- [4] Compared to trends identified in last year’s count, ten of the 15 routes retained the same trend direction as with 2024. Notably four central Otago routes (Luggate, Queensberry, Tarras 2 and Kawarau) in showed a movement from an increasing trend in 2024 to a decreasing trend in 2025. The remaining route (Fruitlands 1) moved from an increasing trend in 2024 to having no discernible trend in 2025. Importantly, no route that had a decreasing trend in 2024 showed an increasing trend in 2025.



Period: 2006-2025

Sample Size: 16

Average: 13.5 rabbits per km

Equivalent MMS from Average: 4-5

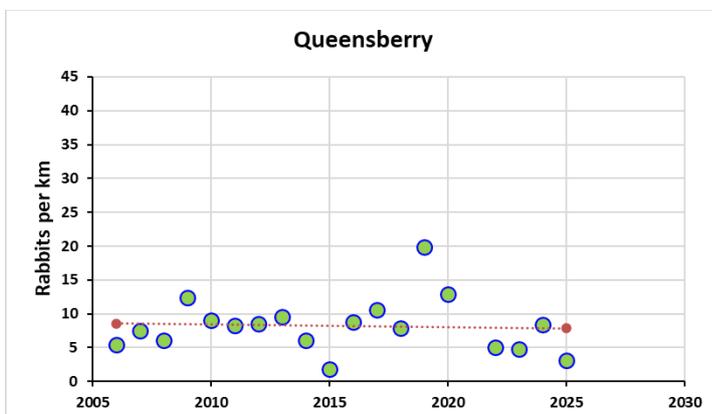
*Night count route is likely to have an average rabbit density **greater than RPMP rules***

Median annual slope:³ -0.07

Trend Confidence: Trend Unlikely

(Likelihood = 0.61)

Trend direction differs from 2024: Yes



Period: 2006-2025

Sample Size: 19

Average: 8.2 rabbits per km

Equivalent MMS from Average: 4

*Night count route is likely to have an average rabbit density **greater than RPMP rules***

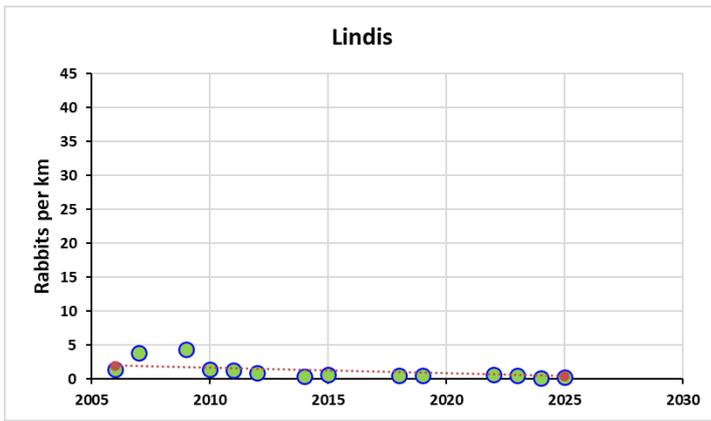
Median annual slope: -0.04

Trend Confidence: Trend unlikely

(Likelihood = 0.58)

Trend direction differs from 2024: Yes

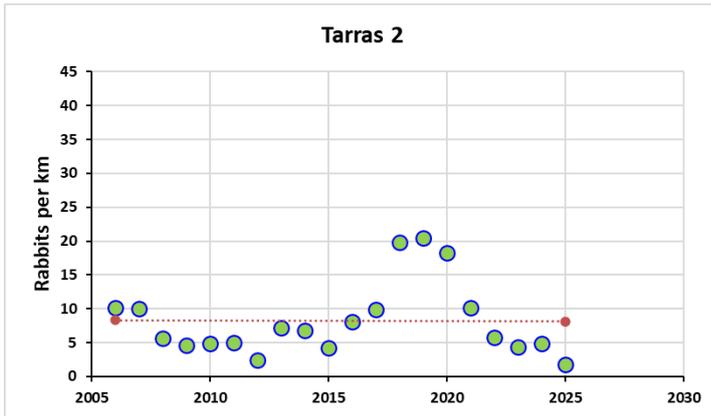
³ Note: Trendline is based on the median annual slope (Mann-Kendall and Sen Slope) and not linear regression.



Period: 2006-2025
 Sample Size: 14
 Average: 1.2 rabbits per km
 Equivalent MMS from Average: 1-2

*Night count route is likely to have an average rabbit density **less than RPMP rules***

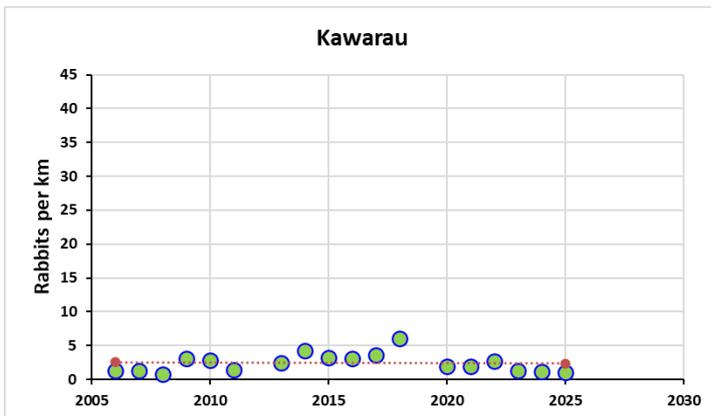
Median annual slope: -0.08
Trend Confidence: Decreasing trend virtually certain (Likelihood = 1.00)
 Trend direction differs from 2024: No



Period: 2006-2025
 Sample Size: 20
 Average: 8.2 rabbits per km
 Equivalent MMS from Average: 4

*Night count route is likely to have an average rabbit density **greater than RPMP rules***

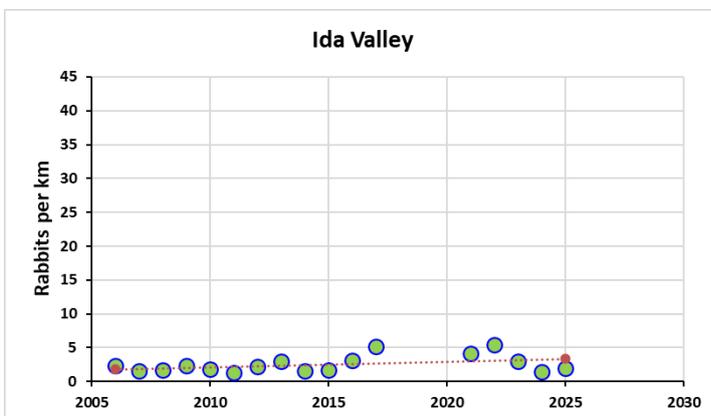
Median annual slope: -0.01
Trend Confidence: Trend unlikely (Likelihood = 0.59)
 Trend direction differs from 2024: Yes



Period: 2006-2025
 Sample Size: 18
 Average: 2.4 rabbits per km
 Equivalent MMS from Average: 2-3

*Night count route is likely to have an average rabbit density **less than RPMP rules***

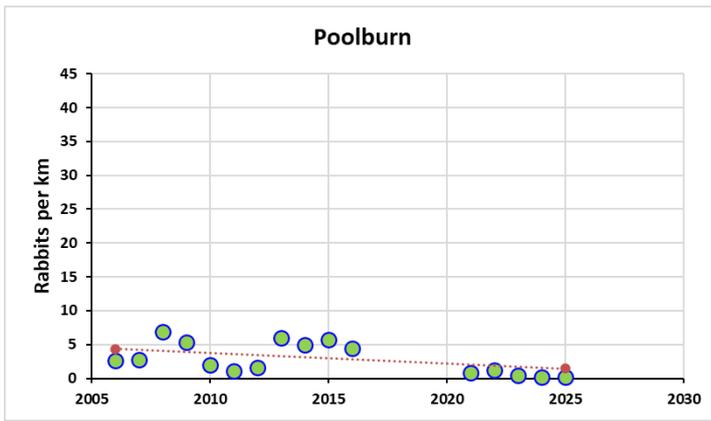
Median annual slope: -0.01
Trend Confidence: Trend unlikely (Likelihood = 0.62)
 Trend direction differs from 2024: Yes



Period: 2006-2025
 Sample Size: 17
 Average: 2.6 rabbits per km
 Equivalent MMS from Average: 2

*Night count route is likely to have an average rabbit density **less than RPMP rules***

Median annual slope: 0.08
Trend Confidence: Increasing trend possible (Likelihood = 0.91)
 Trend direction differs from 2024: No

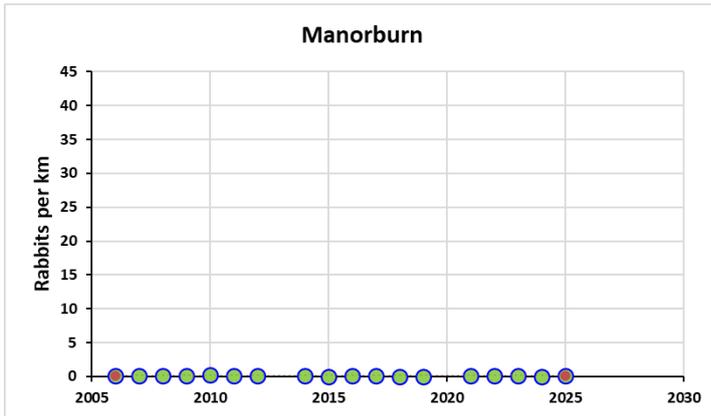


Period: 2006-2025
 Sample Size: 16
 Average: 2.9 rabbits per km
 Equivalent MMS from Average: 2-3

*Night count route is likely to have an average rabbit density **less than RPMP rules***

Median annual slope: -0.15
Trend Confidence: Decreasing trend very likely (Likelihood = 1.00)

Trend direction differs from 2024: No

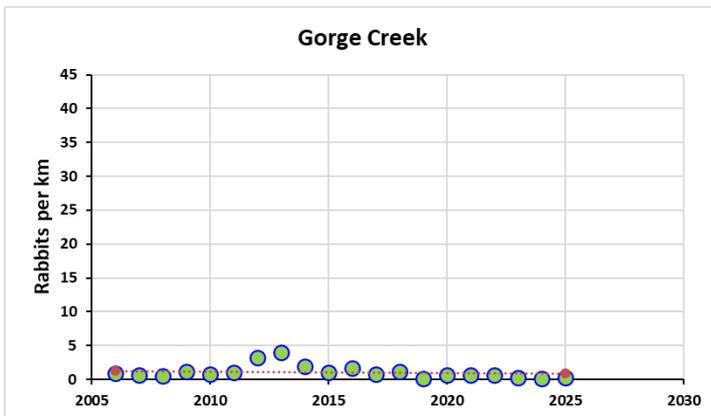


Period: 2006-2025
 Sample Size: 18
 Average: 0.1 rabbits per km
 Equivalent MMS from Average: 1-2

*Night count route is likely to have an average rabbit density **less than RPMP rules***

Median annual slope: 0.00
Trend Confidence: Decreasing trend about as likely as not (Likelihood = 0.82)

Trend direction differs from 2024: No

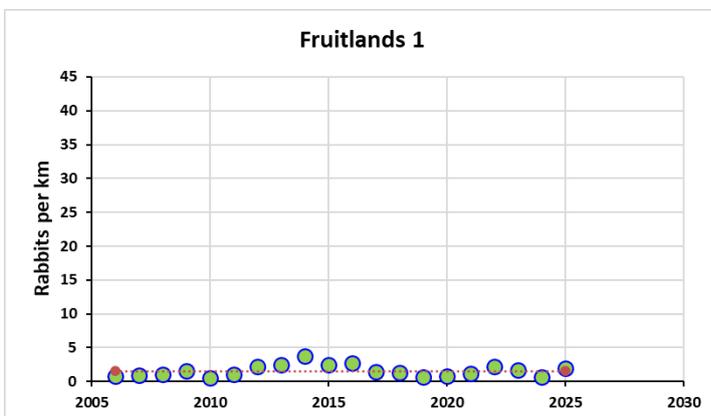


Period: 2006-2025
 Sample Size: 20
 Average: 1.1 rabbits per km
 Equivalent MMS from Average: 1-2

*Night count route is likely to have an average rabbit density **less than RPMP rules***

Median annual slope: -0.02
Trend Confidence: Decreasing trend about as likely as not (Likelihood = 0.83)

Trend direction differs from 2024: No

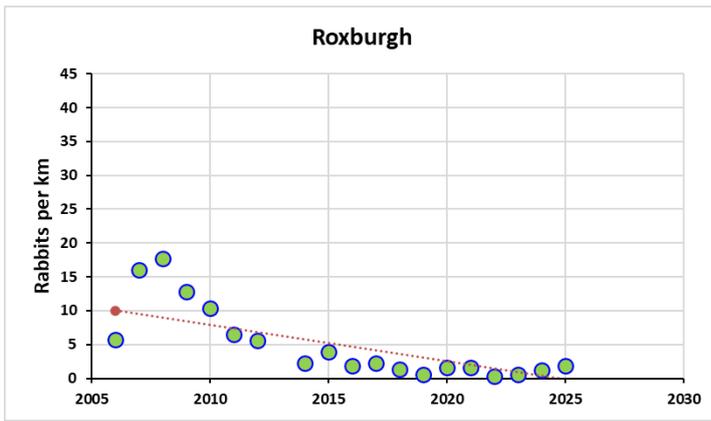


Period: 2006-2025
 Sample Size: 20
 Average: 1.6 rabbits per km
 Equivalent MMS from Average: 1-2

*Night count route is likely to have an average rabbit density **less than RPMP rules***

Median annual slope: 0.00
Trend Confidence: Trend unlikely (Likelihood = 0.59)

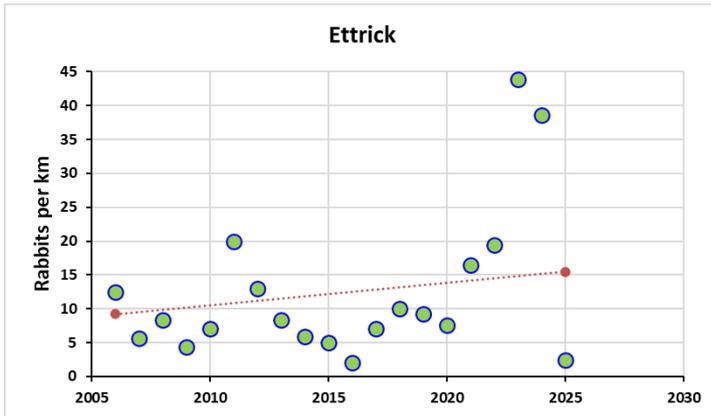
Trend direction differs from 2024: Yes



Period: 2006-2025
 Sample Size: 19
 Average: 5.0 rabbits per km
 Equivalent MMS from Average: 2-3

*Night count route is likely to have an average rabbit density **less than RPMP rules***

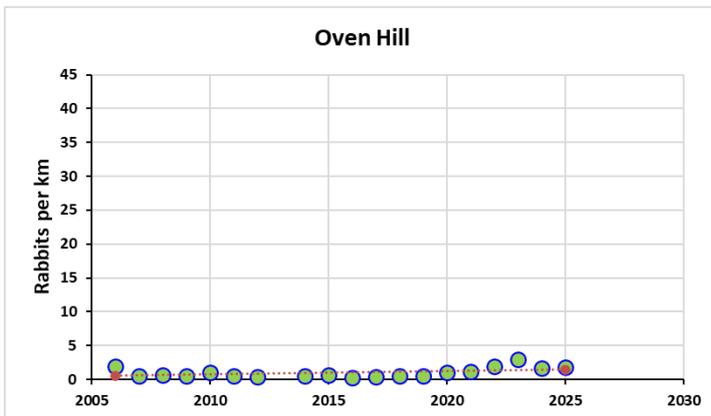
Median annual slope: -0.53
Trend Confidence: Decreasing trend virtually certain (Likelihood = 1.00)
 Trend direction differs from 2024: No



Period: 2006-2025
 Sample Size: 20
 Average: 12.3 rabbits per km
 Equivalent MMS from Average: 4

*Night count route is likely to have an average rabbit density **greater than RPMP rules***

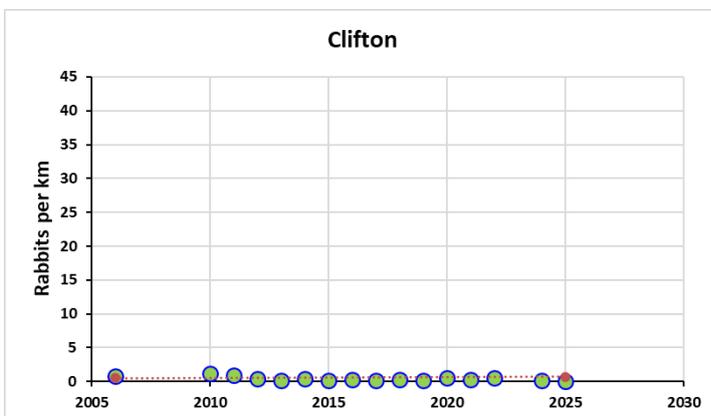
Median annual slope: 0.33
Trend Confidence: Increasing trend possible (Likelihood = 0.88)
 Trend direction differs from 2024: No



Period: 2006-2025
 Sample Size: 19
 Average: 1.0 rabbits per km
 Equivalent MMS from Average: 1-2

*Night count route is likely to have an average rabbit density **less than RPMP rules***

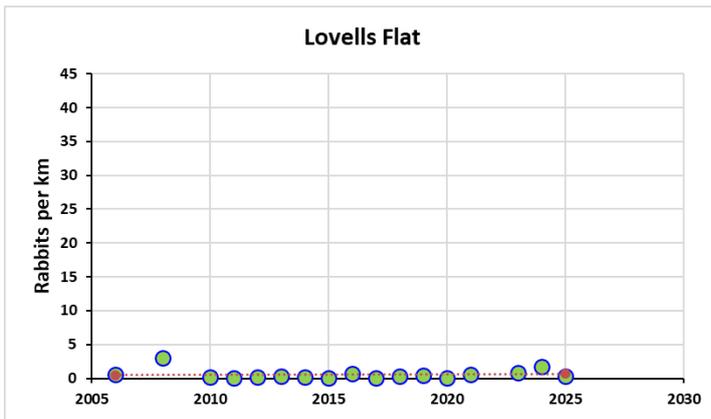
Median annual slope: 0.05
Trend Confidence: Increasing trend likely (Likelihood = 0.95)
 Trend direction differs from 2024: No



Period: 2006-2025
 Sample Size: 16
 Average: 0.4 rabbits per km
 Equivalent MMS from Average: 1-2

*Night count route is likely to have an average rabbit density **less than RPMP rules***

Median annual slope: -0.03
Trend Confidence: Decreasing trend likely (Likelihood = 0.97)
 Trend direction differs from 2024: No



Period: 2006-2025
 Sample Size: 17
 Average: 0.6 rabbits per km
 Equivalent MMS from Average: 1-2

*Night count route is likely to have an average rabbit density **less than RPMP rules***

Median annual slope: 0.01
Trend Confidence: Increasing trend about as likely as not (Likelihood = 0.75)
 Trend direction differs from 2024: No

References

- Bolton, N. (2010). Appendix 3. The use of night-vision equipment in pest and predator control. In E. Murphy, M Crowell & W. Henderson (Eds.). *Workshop proceedings: improving efficiency of rabbit eradications on islands* (pp. 61-67). Invasive Animals Cooperative Research Centre, Canberra, Australia.
- Parkes, J. (2022). Monitoring rabbits in Otago. Kurahaupo Consulting. Report produced for the Otago Regional Council.

Acknowledgements

The 2025 night count data was collected by ORC Biosecurity Officers. This report was prepared for the Manager Environmental Implementation by staff from Environmental Delivery Data & Systems and GIS teams.