Tiromoana Bush photo-point summary 2005-2018

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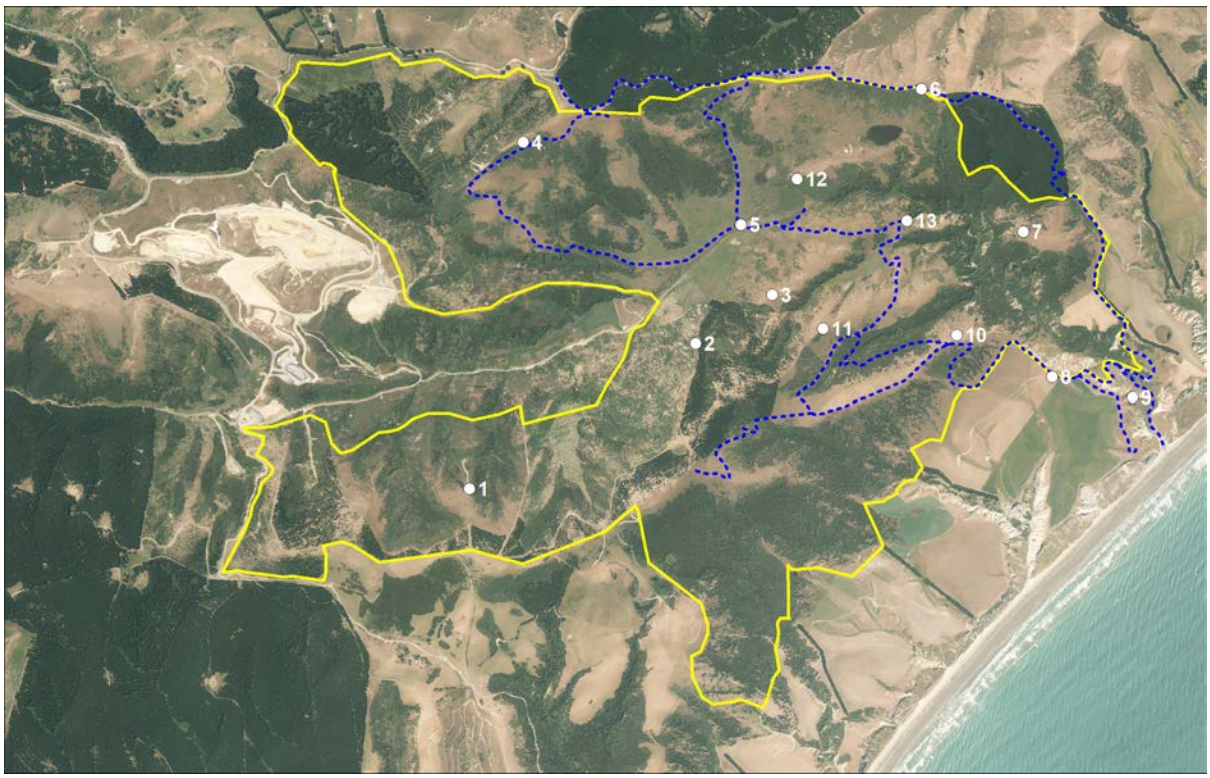
In 2004, 11 photo-points were established at Tiromoana Bush with two additional photo-points established in 2005 and 2007, bringing the total to 13 (see map below). From each photo-point a panoramic series of photos (from 3-12) are taken, comprising a total of 93 images. The photo-points have been re-photographed annually in late December/early January each year, with the exception of 2010 and 2012 (13 sets of images in total). These photo-points provide a broad overview of the Tiormaoan Bush landscape and now with 15-years of photo coverage it is possible to see some of the major changes that are taking place as a result of our management interventions. This report summarises these changes and makes recommendations for the future management of the photo-point network.



While all the images show changes, many of the images show similar patterns of change and I have selected 17 images here which highlight the main changes that are occurring. The following notes summarise these. I have not commented on the plantation forest or landfill infrastructure changes which are also very obvious.

The main patterns that are apparent include:

1. The presence of a thick tall grass sward dominated by cocksfoot across pasture areas. This is an inevitable consequence of removing grazing animals and while it does present challenges for woody species regeneration (due to competition), the evidence below shows that this is a transitional stage to forest and woody regeneration is occurring.

2. A general increase in woody cover due to both native and exotic species establishing into grassland, resulting in an obvious decrease in the area of pasture. While gorse is locally dominant, it does readily invade the dense grassland and acts as a nurse for subsequent forest regeneration. While the increase has not been quantified, it would seem that the extent of woody cover has increased by 10-20% across the whole area.
3. In areas where grey-shrub species were abundant (especially matagouri and mingimingi) mahoe is becoming a lot more dominant (along with pohuehue) signifying a shift from shrubland towards forest.
4. Existing native plants growing in open sites, especially kanuka and mahoe, are taller and have a greater canopy cover and in many places are starting to coalesce to form continuous cover canopies.
5. Restoration plantings are now forming new forest in several areas of Tiromoana Bush, especially on the valley slopes above Kate Pond, on the southern shore of Kate Pond and in the coastal valley.
6. A major storm event in winter 2008 resulted in the formation of a small delta where Kate Stream enters Kate Pond. This appears to have been stable since then, although the pond itself has been turbid since either because of sediment that was deposited into the pond by this storm or because of fresh sediment still eroding into the pond (perhaps out of the delta).
7. Raupo has expanded considerably around Kate Pond. This species was present prior to restoration and has invaded the areas of shallow water around the western end of the pond. If the pond was to silt up, then raupo would likely dominate the whole pond eventually.
8. Some native species have been largely lost from Tiromoana Bush, silver tussock to the dense grass sward and purei to raupo expansion. The loss of silver tussock is an expected result of the succession to woody vegetation (and the weedy nassella tussock is also being lost through this process).

Thoughts on future management of the photo-points

- These are an invaluable record of changing land cover and should be continued annually.
- Some tree removal around PP2 is required to maintain this vantage point, and similar management may be required at others in the future too (e.g. PP4, PP6).
- The photo-point comparisons have considerable potential to be used in promotional material about the Tiromoana Bush project.

The information on photo-point location and access has been updated for future reference.

PP1b (2004-2018)

This image is looking north across the upper part of Kate Valley above the water supply dam. Expansion of woody vegetation cover (native and exotic) is apparent both on the ridge in the middle distance and on the spurs below the photo-point. Gorse is also invading the grassland in the foreground. Wilding pines that were very evident in the 2004 image have been removed.

PP3b (2004-2018)

This image looks north across the centre of Kate Valley just above Kate Pond. It highlights restoration plantings starting to form a closed forest canopy on the low hills in foreground, as well as around the forest edge and up valleys on the far hill slopes. The image also shows infilling of pasture areas by native shrubs and gorse more generally.

PP3c (2004-2018)

This image looks north across Kate Pond, which had not been created when the first photo was taken in 2004. As well as the creation of Kate Pond, the image clearly shows restoration plantings on the near-side of the pond and in the valley in the left middle distance. In addition, in-filling of pasture areas by woody vegetation is evident in many areas. A few silver tussock not far below the photo-point (right) and on the ridge beyond have been lost.

PP4b (2004-2018)

This image is taken on the north side of Tiromoana Bush west of Barbara's Lookout looking southeast. Gorse expansion into pasture is obvious on the gentle slopes in the foreground, while infilling of clearings within areas of woody vegetation is apparent across the hill slopes beyond this.

PP5g (2004-2018)

This image is taken where the walkway crosses Kate Stream not far above Kate Pond and focuses on the hillslope immediately southeast of here. Aside from the dense grass sward which is apparent in most photos, this image shows expanding native woody vegetation (both in terms of area and height) across these dry north-facing hill slopes. The erosion scars apparent in 2004 are no longer visible.

PP6c (2004-2018)

This image is taken from above Ella Pond looking southwest. Expansion of woody vegetation (mainly by native species, but gorse in the bottom right) is clear across all of the faces (mainly north facing in this view) with a consequential loss of pasture. The extent of Ella Pond itself has hardly changed, although it does dry out in some years. Also revegetation of slips apparent in 2004 has occurred while new slips are evident in 2018.

PP9b (2004-2018)

This image is taken looking northwest up the lower part of Kate Stream. Restoration plantings are developing well both below and above the road while clearings in the forest on the far side of Kate Stream appear to be filling in with woody regeneration (mainly native species here).

PP9e (2004-2018)

This image looks northeast across lower Kate Stream. A mix of restoration plantings and growth of existing plants is increasing the coverage of the slopes on the opposite side of Kate Stream.

PP9g (2004-2018)

This image is centred on where Kate Stream reaches Pegasus Bay. Restoration plantings on the valley flats are growing rapidly, with further restoration plants establishing on the southwest facing slopes above these. The five-finger and mahoe in the foreground are also considerably taller and wider.

PP10a (2004-2018)

This image looks northeast across Kate Stream and shows strong woody regrowth in clearings on this face below the rock outcrops. The two kanuka plants in the foreground are also considerable larger (taller and wider).

PP10d (2004-2018)

This image looks west across a tributary valley feeding into Kate Stream. Gorse has expanded considerably into pasture on the far hillside beyond the kānuka forest where small clumps of ngaio and kānuka established in a direct seeding trial are also apparent. The native broom (a palatable species) in the foreground is considerably taller and bushier than in 2004.

PP11e (2004-2018)

This view is looking in the opposite direction to PP10d. Expanding gorse patches are clearly evident on this side of the kānuka forest while expansion of individual kānuka plants and infilling by kānuka is apparent on the far side of the kānuka forest. Although not evident in many of the photos, this image shows a solitary silver tussock in 2004 that has been lost by 2018 – this pattern occurs widely across Tiromoana Bush.

PP12b (2005-2018)

This image is taken from near the end of the ridge that separates Kate Pond from the valley containing Ella Pond and looks south across Kate Pond. The photo clearly highlights the way restoration plantings (with some gorse) can change an area totally as seen on the far side of Kate Pond. The expansion of native woody vegetation on the hill slopes further back is also clearly evident.

PP12c (2005-2018)

This view looks southwest up Kate Valley. The image clearly shows the delta formed by Kate Stream after two severe storm events in the winter of 2008 and the expansion of raupo around the shores of Kate Pond. Raupo was present prior to the creation of Kate Pond in the small pond to the north (see PP12e), but has since spread around the top end of Kate Pond. Kate Pond also appears to have become considerably more turbid since these storm events although it is unclear if this is simply suspended sediment in the pond or if there is new sediment still entering the pond.

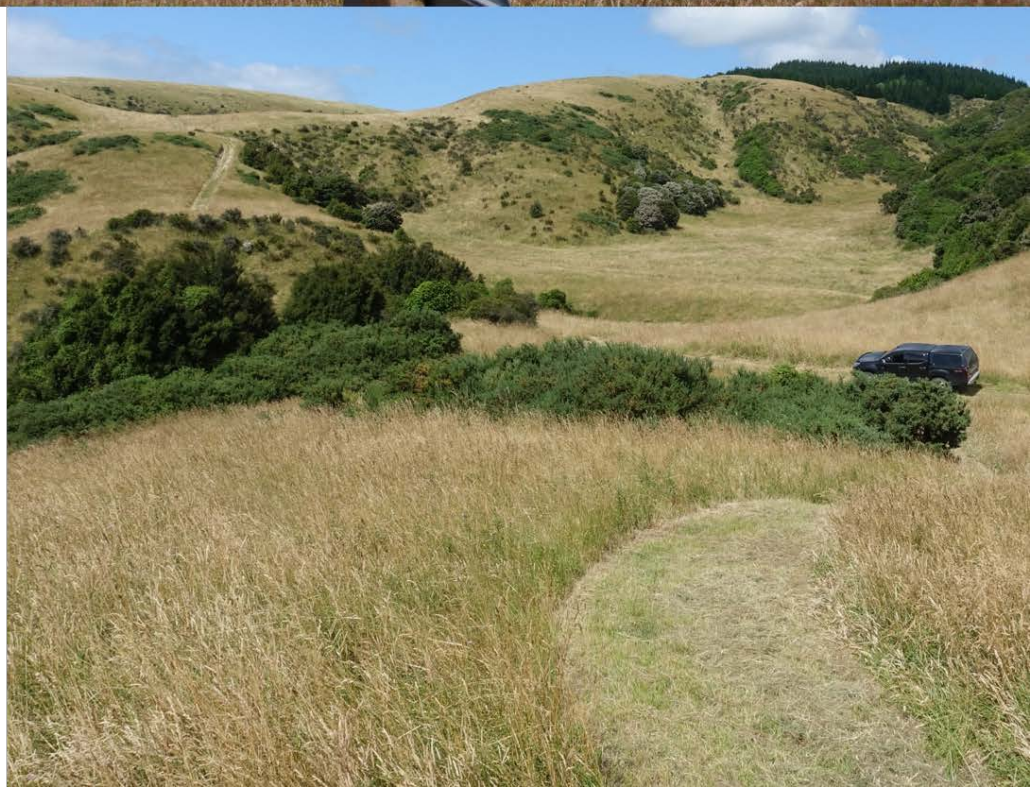
PP12e (2005-2018)

This image looks northwest from the same viewpoint. The expansion of raupo is again visible and with this there has been a loss of the wetland sedge purei whose distinctive clumps are clear to the left of the raupo in the 2005 photo. The restoration up the valley behind the pond stands out clearly and the hill side beyond this is now virtually free of pasture as woody vegetation has almost completely filled this area in. In the left foreground, mahoe appears to have increased in abundance from 2005 and 2018 and now dominates the woody vegetation.

PP13d (2007-2018)

This image looks south from the cliff-top platform above Kate Stream below the pond. It clearly shows an increase in gorse cover, but also a marked increase in size of kānuka plants and also expansion of grey shrubland species (matagouri & mingimingi) across the hill slopes.

PP13e (2007-2018)



The view southwest from the cliff-top look-out also shows a strong increase in woody cover, both gorse and native woody species. The increase in kānuka to the right of the track in the left-middle distance is particularly striking.