

KAWEKA MOUNTAIN BEECH PROJECT ANNUAL REPORT **2016/17**

Kellie Mayo
Department of Conservation
Hawke's Bay District Office

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Summary

The objectives for the Kaweka Mountain Beech Project 2016/17 season were to carry out faecal pellet monitoring and check enclosure fences. No aerial deer control has been carried out this season, instead DOC has allowed recreational hunters the opportunity to prove that recreational hunting can keep the sika deer population at a level that allows for mountain beech regeneration. No vegetation monitoring was carried out this season as it was decided that we could not progress until we have a robust monitoring plan with clear objectives. This will be a priority for next season.

150 Faecal Pellet Index (FPI) lines were re-measured across five blocks within the Kaweka Mountain Beech Project Area. Analysis has been carried out on FPI results collected over the past eleven years. Overall, results show no real change in FPI values since 2006/07, with average FPI scores for all blocks combined trending slightly up. The Tussock block showed the biggest annual, with an increase from 17 to 26 FPI.

All enclosure fences were visited and checked. All but one fence was found to be still relatively deer proof, although some fences have been damaged by the winter storm and require work if they are to remain deer proof. No repair work was carried out, instead a full inventory of the condition of the fences was recorded. The future of these fences needs to be decided upon before allocating resources to this.

The Kaweka Hunter Liaison Group has been focusing on upcoming OSPRI TBfree possum control operations and discussing the impact that these operations may have on recreational hunting activities. TBfree's application for the Kaweka East aerial 1080 possum control operation originally planned for winter 2016 was declined by DOC due to a lack of consultation with recreational hunters and other stakeholders. OSPRI have expressed a desire to carry out more comprehensive consultation leading into future operations.

A large snow storm in winter 2016 caused considerable damage to vegetation in the Kaweka Forest Park. Mainly manuka/kanuka and red beech forest was affected, with some places losing at least half of the canopy.

It has now been ten years since the last Kaweka Mountain Beech Project Review. A priority for the coming season will be to carry out a review of the project to date and come up with an action plan for the next ten years.

1. INTRODUCTION

The Kaweka Mountain Beech Project is designed to protect the mountain beech forest in the Kaweka Forest Park from the impacts of deer and to promote resilience of the forest by maintaining adequate seedling recruitment and growth rates that allow for ongoing sufficient regeneration. Sufficient regeneration is defined as a seedling growth rate that leads to canopy and gap closures at most open sites within 40 years.

A study was conducted in the 1990's titled "*Mountain Beech Forest Dynamics in the Kaweka Range and the Influence of Browsing Animals*" (Allen and Allan 1997). The key finding illustrated that browsing by deer was having a widespread detrimental influence on regeneration and species composition of mountain beech (*Fuscospora cliffortioides*) forest.

Following this report, a working party was established to work with DOC to address the management of the mountain beech forest. This working party consisted of Tangata Whenua, New Zealand Deerstalkers Association (NZDA), helicopter concessionaires, Federated Mountain Clubs, Forest and Bird, Hawke's Bay Conservation Board and scientific advisors from Landcare Research. The working party determined that Kaweka Forest Park had a deer induced problem and that aerial hunting would be the method used to control deer numbers.

Aerial Deer Control (ADC) commenced in 1998 over 11,386 ha. The ADC operation has had minor changes through the years with block sizes changing depending on the results of annual monitoring. ADC ceased in 2015 for a period of three years to allow the opportunity for recreational hunters to prove that they can keep deer populations at a level that allows for mountain beech regeneration.

Result monitoring has been carried out annually in the form of faecal pellet index monitoring. Vegetation monitoring, using various methods, has been carried out periodically as outcome monitoring.

This report presents field data and information collected over the 2016-2017 monitoring season for the following Targets and Objectives;

Objective One

Maintain adequate seedling recruitment and growth rates that allow for ongoing regeneration.

Adequate mountain beech regeneration is identified as seedling growth rates that lead to canopy and gap closures at most open sites within 40 years.

This will be achieved by:

- continuing to control deer to densities that allow for adequate mountain beech regeneration
- employing a deer density monitoring programme to assess the results
- employing a vegetation monitoring programme to assess the objectives
- reviewing management options and researching methods to increase protection of the mountain beech forest and the biodiversity of the Kaweka Forest Park

Objective Two

Increase visitor use in the Kaweka Forest Park and actively promote and enhance all recreational hunting opportunities.

This will be achieved by:

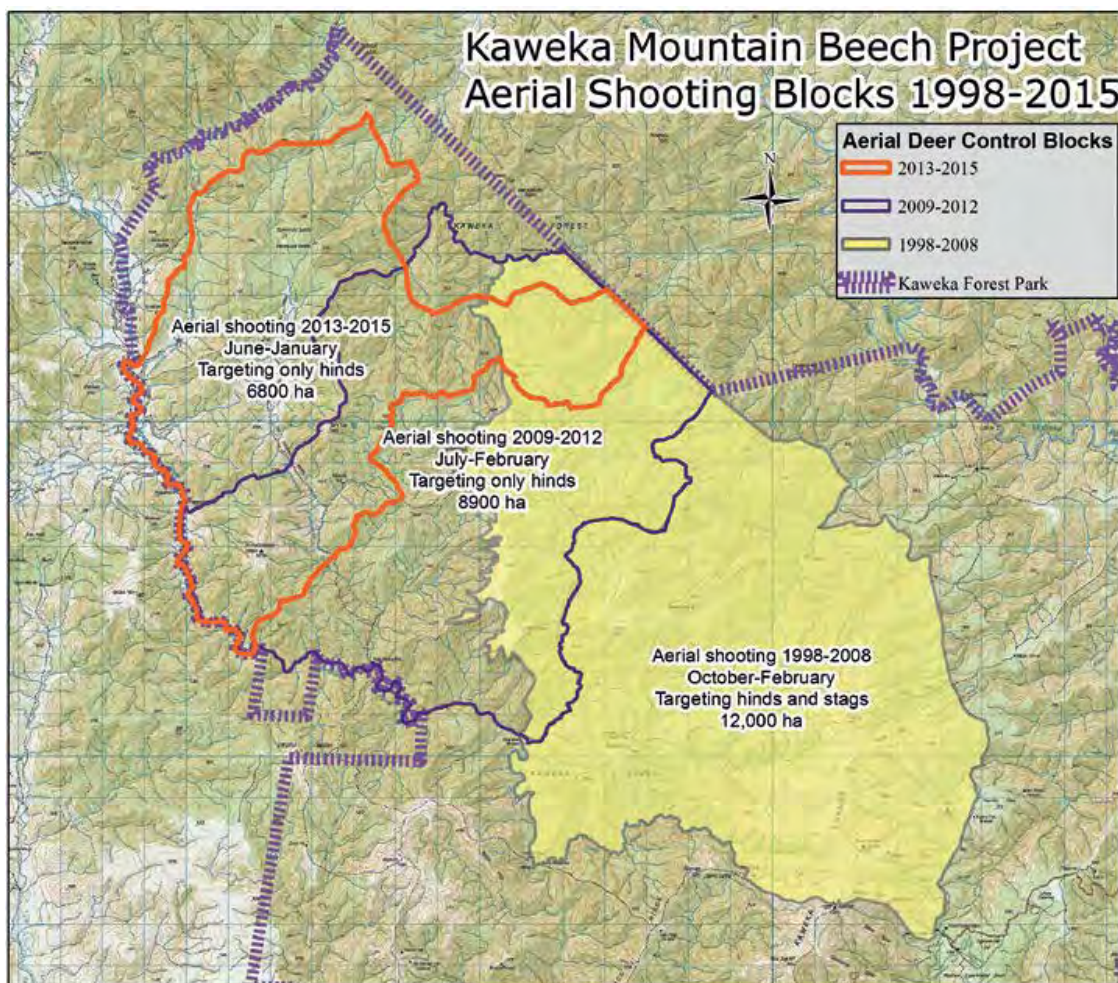
- raising awareness of and improving access to information on recreational hunting opportunities
- maintaining relationships and regularly meeting with Kaweka Forest Park user groups including NZDA, Tramping Clubs, concessionaires, Forest and Bird, Iwi, Federated Mountain Clubs and the Kaweka Hunter Liaison Group.
- working within Conservancy towards a more holistic approach to all issues relating to the Kaweka Forest Park.

2. AERIAL DEER CONTROL

No aerial deer control was carried out during the 2016/17 season.

In conjunction with the Kaweka Hunter Liaison Group (KHLG), it was agreed that aerial deer control would be put on hold for a period of time to see if recreational hunting alone would be sufficient to keep the sika deer population at a level that allowed for mountain beech regeneration. At a KHLG meeting held 14/7/16, DOC agreed that this trial will run until 2019, at which time we will decide whether aerial deer control should be reintroduced.

Two articles were published in NZhunter magazine, written by Dan Herries, former coordinator of the Kaweka Mountain Beech Project. The first article published in the Dec 2015/Jan 2016 edition titled '*Kaweka aerial deer control coming to an end*' encourages hunters to hunt in the Kaweka Forest Park to prove that recreational hunting can control the deer population. The second article published in the Feb/March 2016 edition titled '*Kaweka Mountain Beech Project, 18 year summary*' provides a good summary of the past 18 years of the KMB project.



Map 1. Shooting block boundaries over the duration of the project, taken from the Feb/March 2016 NZhunter article '*Kaweka Mountain Beech Project, 18-year summary*'.

3. FAECAL PELLET INDEX MONITORING

150 faecal pellet index transects were measured during the 16/17 field season. 30 transect lines were re-measured in each of the five blocks that have received aerial deer control at some time during the Kaweka Mountain Beech Project; Tussock, Harkness, Te Puke, Mangaturutu/VT and Ballard. It was decided at the Kaweka Hunter Liaison Group meeting held 3/11/16 that all five blocks would be measured this season. This provides an opportunity to gain a full data-set following the suspension of aerial deer control. This could also be the last opportunity to get data pre-aerial 1080 control.

FPI monitoring was carried out using a modified version of Forsyth et al.'s 2005 faecal pellet index (FPI) protocol. The method is basically the same; the observer navigates to a random (now permanently marked) GPS point in mountain beech strata. A random compass bearing is followed with 1m radius plots being searched at 5 m spacings. 30 plots are searched per transect. The difference in the protocol is that instead of counting each individual pellet within a plot, only the number of pellet groupings/defecation events are recorded.

FPI monitoring was carried out by Hawkes Bay District Office staff; Kellie Mayo, Mel Williamson, Alan Lee, Matt Brady, Peter Abbott, Mikey Wilcox and Tier 1 monitoring staff; David Thomas, Laura McIvor, Chris Andrews and Matt Short and one volunteer; Andrew Herries. Monitoring was carried out between December 2016 and March 2017.

It was interesting to note that although the same protocol for 'definition of intact pellets' is followed for both Tier 1 ungulate monitoring and KMB monitoring, the Tier 1 staff's interpretation of what is classified as an 'intact' or 'non-intact' pellet differs slightly, with tier 1 staff tending to count predominantly more pellets as 'intact' than DOC staff who have worked on the KMB project in the past. For this reason, each tier 1 team member was paired up with a Napier DOC staff member for the first few days of pellet counting to calibrate to how the monitoring has been done in previous years.

Analysis of FPI data

Forsyth's FPI protocol is currently the only feasible method of estimating long term changes in relative abundance of deer in New Zealand forests. Forsyth 2005 states that without considering factors such as; the number of faecal pellets in the forest, the rate that a deer defecates, or the rate of pellet decay, attempting to estimate the number of deer in an area of forest is not recommended. These other factors are currently unknown to us, making it impossible to make statements about the number of deer in the Kaweka Forest Park. The usefulness of this data is that it has been collected annually over a long timeframe and therefore should allow us to see changes over time. There can be a lot of variation in pellet counts due to factors such as; seasonal influence on pellet breakdown, observer bias as to what constitutes a pellet grouping and differing interpretations of what constitutes an 'intact' or 'non-intact' pellet. Analysing FPI data can be difficult.

Results from this seasons monitoring are displayed on the Kaweka Forest Park Deer Hotspot Map. Appendix 3

All blocks combined

Combined average pellet counts for all blocks

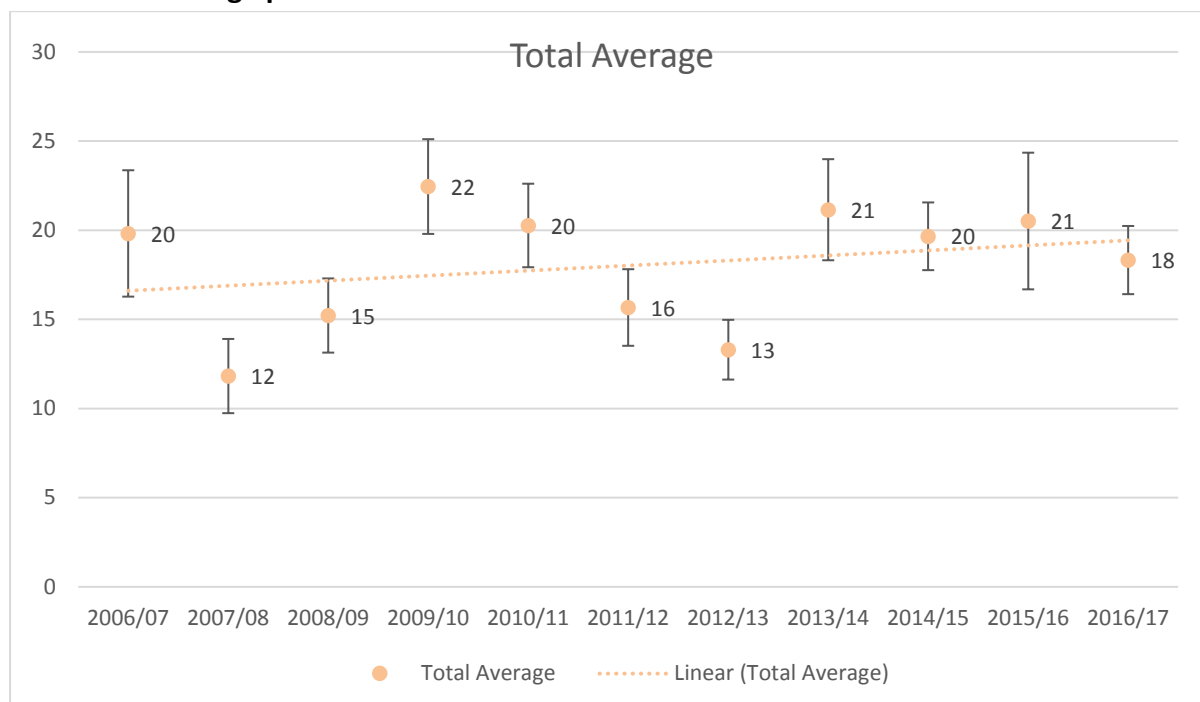


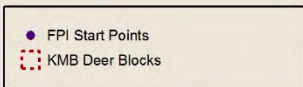
Figure 1. Combined average FPI score across all blocks for each year from 2006/10 to 2016/17

The number of FPI transects measured varies from year to year, from 50 transects carried out in 2006/07 to 210 transects carried out over 7 blocks in 2012/13, see Table 1. The 2012/13 measurement includes 60 transects measured in 2 blocks that have never received aerial deer control, these blocks are Manson and South Kaweka.

There is a slightly upward trend in combined average FPI results. Overall, the average FPI results have not changed significantly in the past ten years.

Block	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17
Ballard	12	14	30	30	30	30	30	0	30	0	30
Manga/VT	26	24	30	30	30	30	30	0	30	0	30
Te Puke	12	13	30	30	30	30	30	0	30	0	30
Harkness	0	20	30	30	30	30	30	30	30	30	30
Tussock	0	0	0	0	0	0	30	30	30	30	30
Manson	0	0	0	0	0	0	30	0	0	0	0
South Kaweka	0	0	0	0	0	0	30	0	0	0	0
Total transects	50	71	120	120	120	120	210	60	150	60	150

Table 1. Number of faecal pellet transects measured in each Kaweka Mountain Beech Project block per year.



KMB Block & FPI Locations



Department of Conservation
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New Zealand Government

Map 2. Location of all aerial deer control blocks in the Kaweka Mountain Beech Project area

Ballard block

The Ballard block, along with Mangaturutu/VT block was one of the earliest blocks to receive aerial deer control. Control was carried out from 1998 to 2008. FPI monitoring has been carried out in the Ballard block annually since 2006/07, except for 2013/14 and 2015/16 when no measurements were carried out.

Average pellet counts - Ballard block

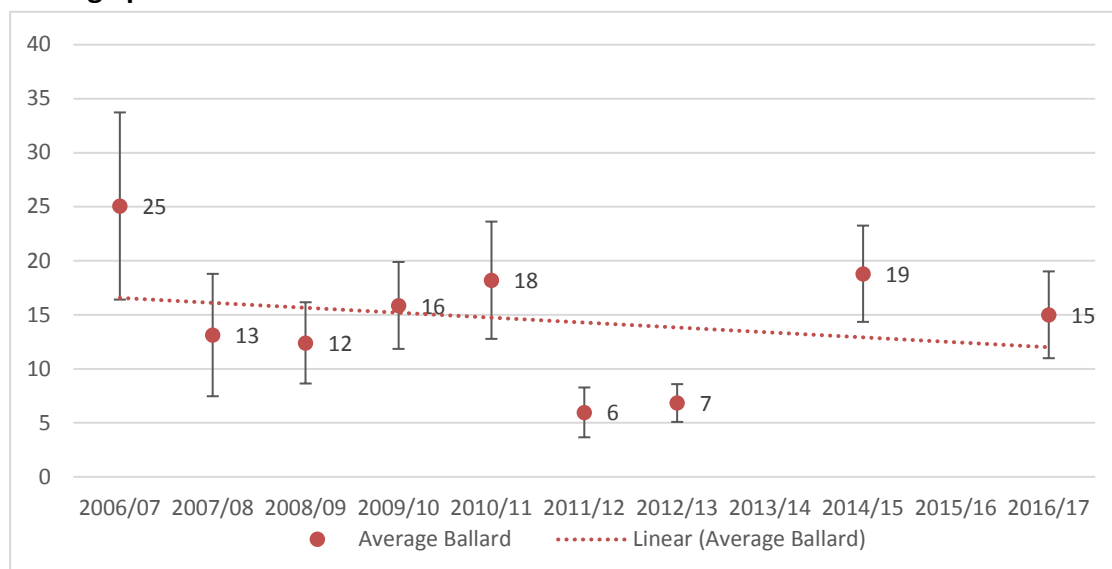
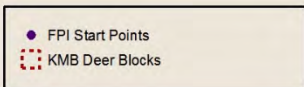
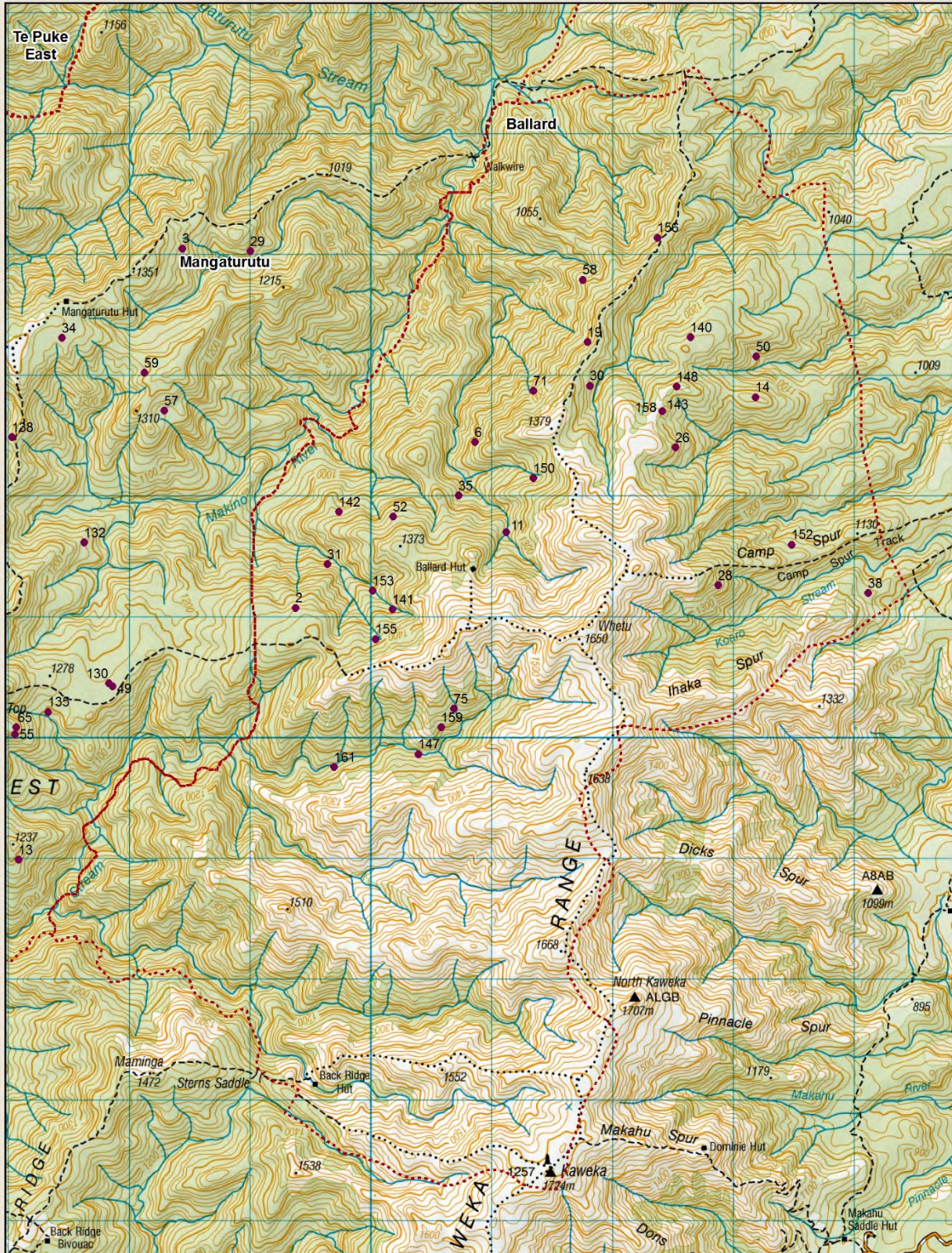


Figure 2. FPI results for Ballard block from 2006/07 to 2016/17

There is a slight downward trend in FPI results. At the end of aerial deer control in this block, FPI dropped from 25 FPI in 2006/07 to 12 FPI in 2008/09. There were no significant changes in FPI measurements for most years following the cessation of aerial deer control. Average FPI scores have remained within a similar range except for the years 2011/12 and 2012/13 when FPI measurements dropped to 6 & 7 FPI. The average FPI result in 2016/17 is similar to what it was during the final years of aerial deer control.



**KMB Ballard Block
FPI Locations**



Department of Conservation
Te Papa Atawhai
New Zealand Government

Map 3. Ballard block boundary and FPI transect locations

Mangaturutu/VT block

The Mangaturutu/VT block, along with Ballard block was one of the earliest blocks to receive aerial deer control. Control was carried out from 1998 to 2008. FPI monitoring has been carried out in the Ballard block annually since 2006/07, except for 2013/14 and 2015/16 when no measurements were carried out.

Average pellet counts – Mangaturutu/VT block

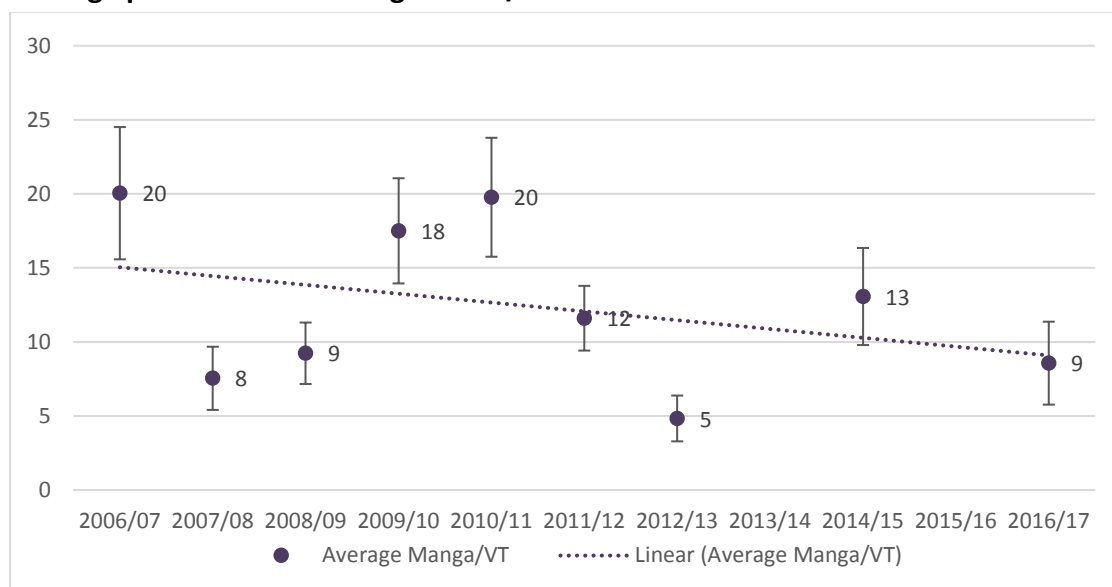
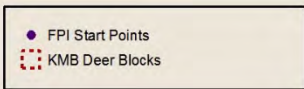


Figure 3. FPI results for Mangaturutu block from 2006/07 to 2016/17

There is a downward trend in FPI results. During control FPI dropped from 20 FPI in 2006/07 to 8 FPI in 2007/08. FPI measurements have varied over the past ten years. In 2010/11 the FPI score was the same as it was during control (20 FPI). In 2012/13 the lowest average FPI score of all blocks was recorded (5 FPI). The average FPI result in 2016/17 is the same as it was the year following ADC (9 FPI).



KMB Mangaturutu Block FPI Locations



Map 4. Mangaturutu block boundary and FPI transect locations

Te Puke block

The Te Puke block has received aerial deer control for the longest period of time of any of the blocks within the Kaweka Mountain Beech project area. Control was carried out between 1998 and 2012 across the whole block. Between 2013 and 2015, only the Northern quarter of the block received aerial deer control. (see map 1) FPI monitoring has been carried out annually since 2006/07, except for 2013/14 and 2015/16 when no measurements were carried out.

Average pellet counts - Te Puke block

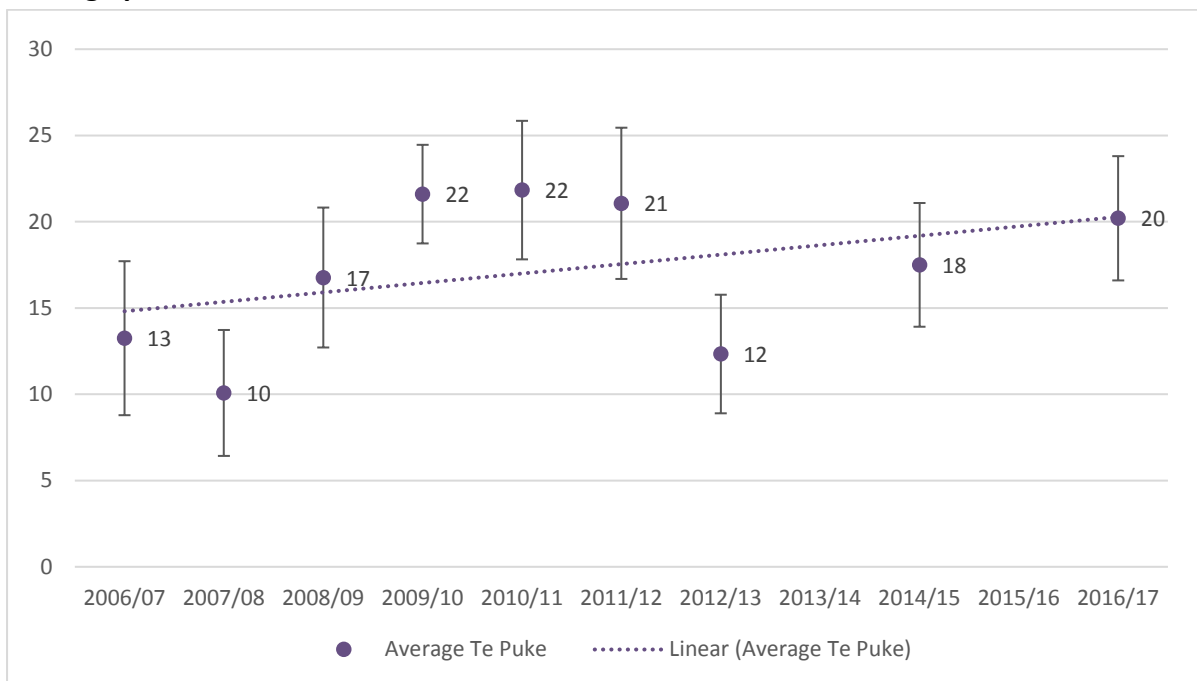
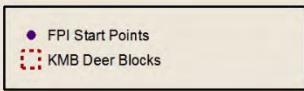


Figure 4. FPI results for Te Puke block from 2006/07 to 2016/17

There is an upward trend in FPI results. FPI scores increased during the time that aerial deer control was being carried out across the entire block and varied from 10 FPI in 2007/08 to 22 FPI in 2009/10 & 10/11. During the first year that control was restricted to the Northern quarter of the block, FPI dropped to 12 FPI. Since control has stopped FPI has increased to 20 FPI. The average FPI result in 2016/17 is similar to what it was between 2009 – 2012. Despite receiving aerial deer control for the longest period of time, there has been no significant decrease in FPI results.



**KMB Te Puke East Block
FPI Locations**



Map 5. Te Puke block boundary and FPI transect locations

Harkness block

The Harkness block received aerial deer control from 2009 to 2012. From 2013, control was carried out over approx. half of the block only (see map 1). FPI has been carried out annually since 2007/08.

Average pellet counts – Harkness block

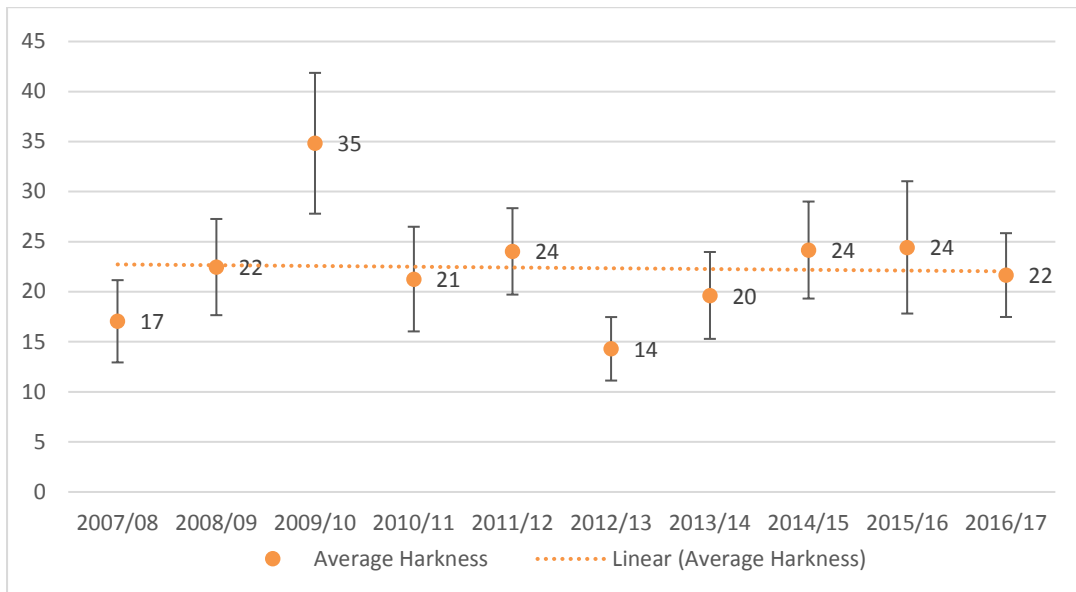
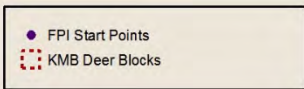
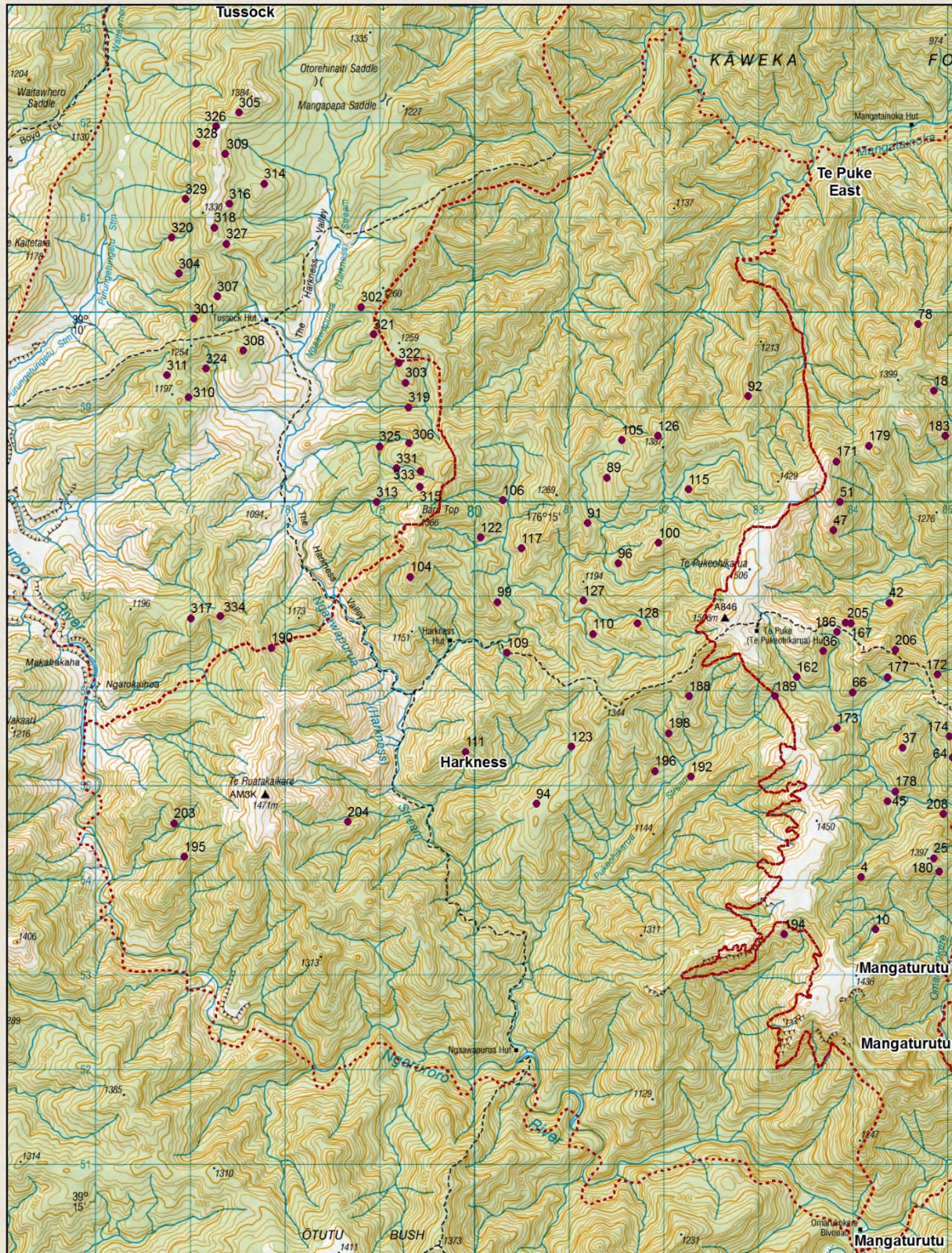


Figure 5. FPI results for Harkness block from 2007/08 to 2016/17

The trend has remained the same for the past ten years. The year that aerial deer control started, FPI rose to 35 FPI which is the highest FPI average value recorded for any of the blocks. In 2012/13 the FPI dropped to 14 FPI. FPI scores increased once control was being carried out over only half of the block. The average FPI result in 2016/17 is the same as it was the year prior to control being introduced (22 FPI).



**KMB Harkness Block
FPI Locations**



Map 6. Harkness block boundary and FPI transect locations

Tussock block

The Tussock block first received aerial deer control in 2013 due to concerns following vegetation monitoring in 2012, that this block was not showing sufficient regeneration of mountain beech forest. Aerial deer control was carried out from 2013 to 2015. During this period, the number of sika deer shot was low in comparison to previous years due to a lack of resources to allow for the work to be completed. FPI monitoring has been carried out in this block annually since 2012/13.

Average pellet counts – Tussock block

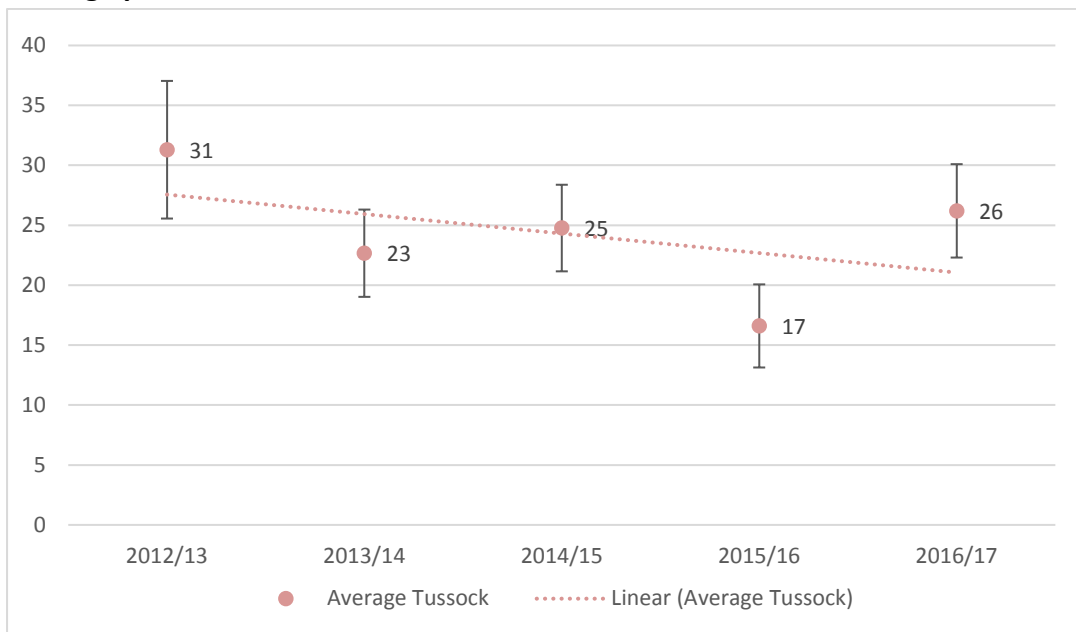
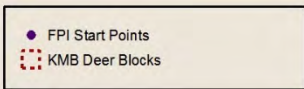
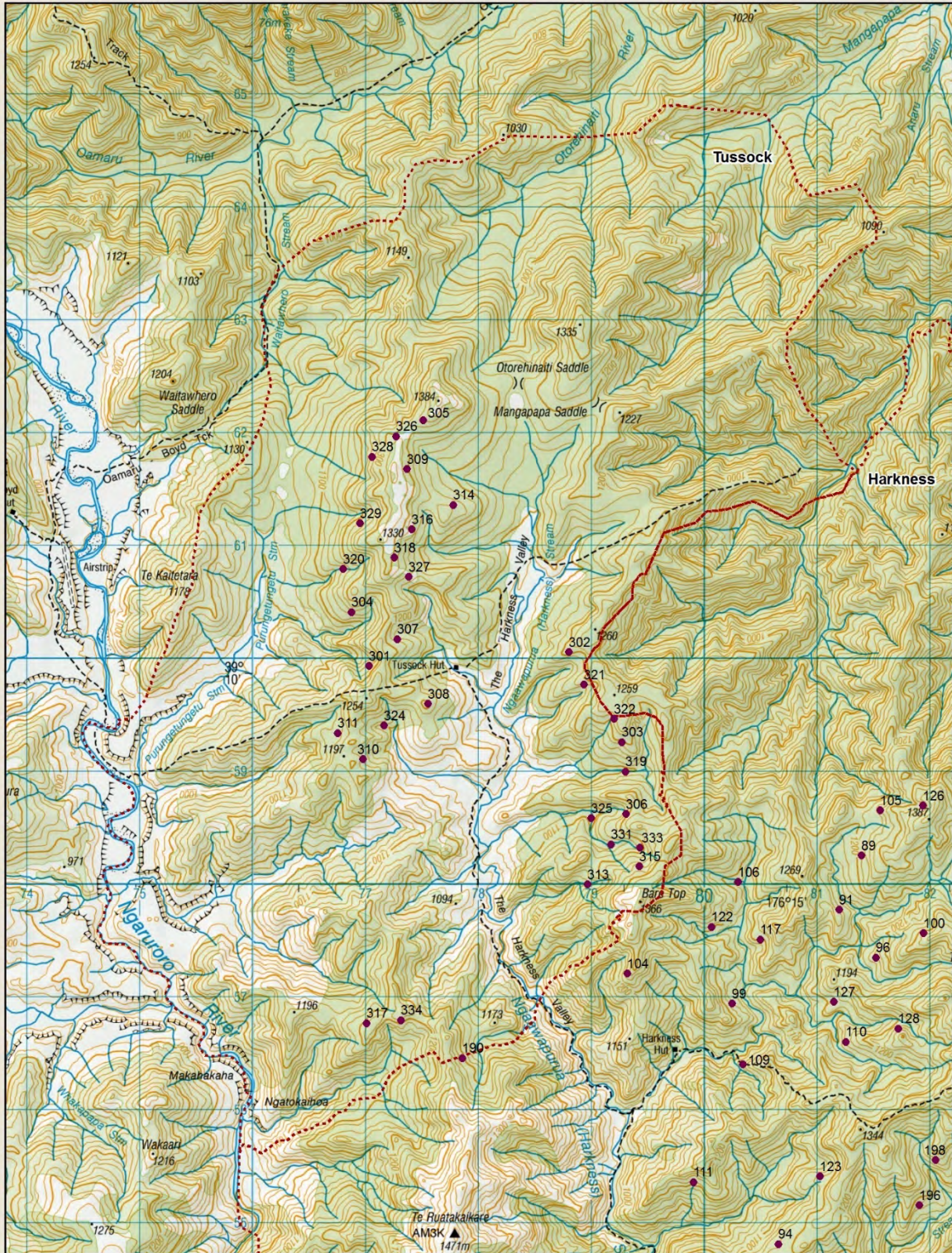


Figure 6. FPI results for Tussock block 2012/13 to 2016/17

Although there is a downward trend in FPI results, FPI has remained high in this block. Following control, FPI dropped from 31 FPI in 2012/13 to 25 FPI in 2014/15. The FPI result in 2016/17 of 26 FPI is similar to what it was following control. It is likely that the Tussock block has not received sufficient aerial deer control to reduce the deer population.



KMB Tussock Block FPI Locations



Map 7. Tussock block boundary and FPI transect locations

4. EXCLOSURE MAINTENANCE

Objective

Maintain five 20 x 20m and thirty-three 10 x 10m deer exclosures to a deer proof standard. Check annually or as soon as possible following a severe weather event, repair as necessary.

Results

During August 2016 a large snow dump caused considerable damage to vegetation, particularly in the manuka/kanuka and red beech forest. All exclosures were visited in October 2016 and assessed for damage post storm. Most of the exclosures appear to still be relatively deer proof, however a lot of the fences had bent warratahs and sagging netting due to the weight of snow during the storm. Some fences, particularly at rocky locations are starting to develop gaps below the netting where a deer could make its way under if it were hungry enough. No repairs were carried out as resources were not available for this work. A full inventory of work required can be found: DOC-5463956

A large log was removed from the Harkness exclosure fence. This issue was identified in last year's exclosure checks, meaning that it was not deer proof for a period of at least one year.



Te Puke single exclosure, showing leaning strainer post.

Conclusion

Resource will need to be made available if these exclosures are going to be maintained to a deer proof standard. Currently, we have no clear reason for prioritising resources for carrying out this work. The planned ten-year review and consequent ten-year plan should give us a clearer direction here.

5. WINTER SNOWSTORM of 2016

A large snow event occurred in August 2016. This caused considerable damage to vegetation within the Kaweka Forest Park. Damage occurred mainly in manuka/kanuka forest at the edges of the park, and to red beech forest in the North and East of the park. In some places, the red beech forest appears to have lost over half of its canopy. Mountain beech forest was less affected, but in some areas trees have lost at least half of their canopy. The additional light let through the canopy has allowed bush lawyer shrubs to grow prolifically, particularly in the Tussock area, making travel off track more difficult than it was previously.

Damage to walking tracks was considerable. Most of the huts were surprisingly undamaged.



The three gorges plateau, showing red beech forest canopy now lying across the track.

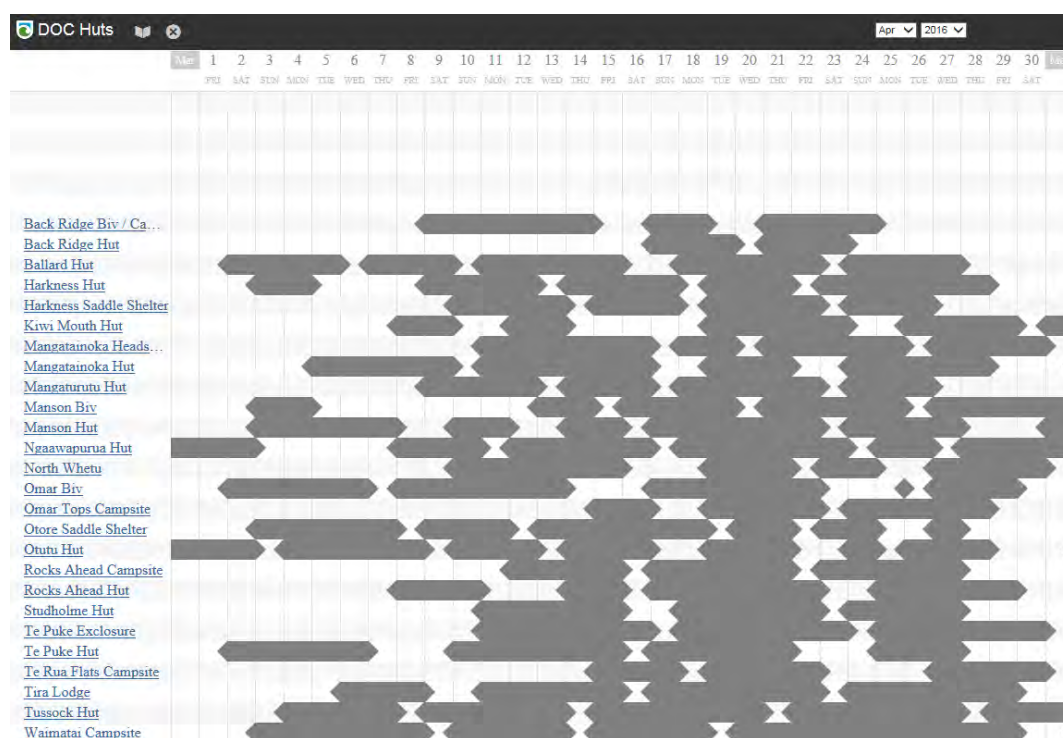


Back Ridge hut several days after the snow dump

RECREATIONAL HUNTER ACTIVITY

Hut booking system

The Kaweka hut notification system continues to be popular with hut and campsite landing sites booked used solidly through the summer, and autumn roar period. Shelters and campsites put in to encourage hunters to high density areas of the park continue to be underutilised. The most likely cause of this is that information about the existence of these locations is not publicly accessible. In an attempt to address this, we have now made the hut notification system viewable to the public. The public are unable to make changes, or see specific booking details, but can easily see when huts are available in order to plan hunting trips.



Screenshot of public viewable doc huts website.

The hut notification system, deer density maps and KMB reports are now able to be accessed on the newly developed DOC website page www.doc.govt.nz/kaweka-sika. Unfortunately, due to DOC website constraints, we were unable to get this page linked to any of the main DOC search pages. We were also unable to get additional campsites and shelter locations loaded onto the publicly accessible DOC GIS mapping system due to the system not being able to be updated any further than what it is currently. This continues to be a frustration in getting this information out to the public and is something that gets brought up at KHLG meetings time and again.

6. EXTERNAL ENGAGEMENT

Sika Show

Hawke's Bay District staff attended the Sika Show held in August 2016. Once again, the main topic of conversation at the Sika show was hunters wanting to know where the additional helipads and shelters are located. Maps displaying these locations were sold for \$5 each. See Appendix 1.

Emphasis was put on encouraging recreational hunters in to the Kaweka Forest Park. A brochure was developed, advertising that *'This summer, no aerial deer control will take place in the park. Instead, DOC will rely entirely on recreational hunting. This trial will run until 2019, when DOC will decide whether aerial control should be reintroduced.'* The brochure was also used to advertise the new DOC website link to resources and further information. DOC-5511444

Deer density maps showing results of FPI monitoring carried out in 2015/16 were displayed on the wall and handed out. See Appendix 2.

Kaweka Hunter Liaison Group

The Kaweka Hunter Liaison Group (KHLG), represents local and national recreational hunting interests, with the aim of meeting at least twice a year. This provides a forum for regular discussions between recreational hunters and DOC to discuss the KMB project and other issues relating to the Kaweka Forest Park.

Three meetings were held at the Napier DOC office during the year, minutes for these meetings can be found;

14th July 2016: DOC-2836838

3rd November 2016: DOC-2923278

7th March 2017: DOC-2991567

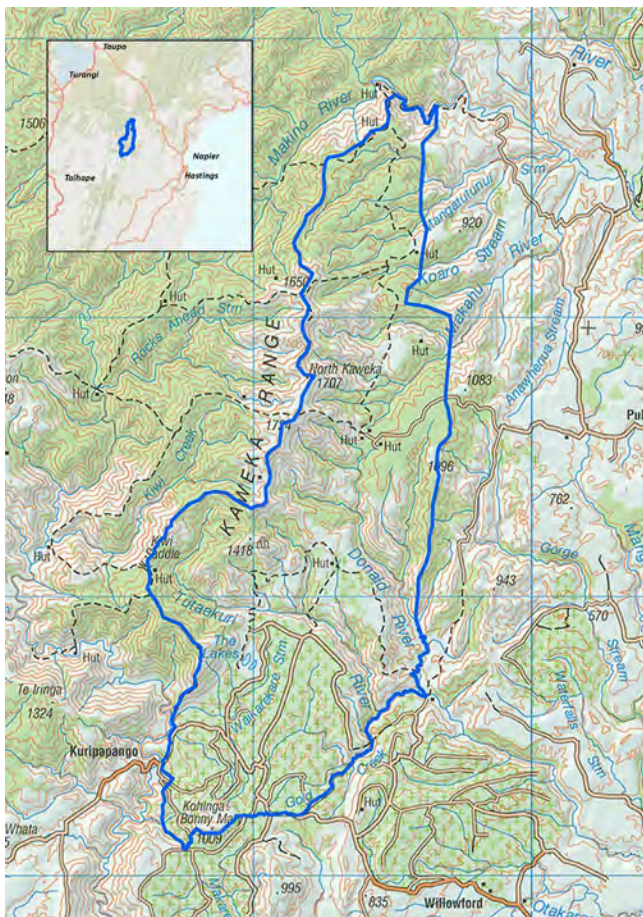
The KMB project was discussed very briefly, as the majority of time at these meetings was spent discussing OSPRI's TBfree possum control programme and plans for control in the Kaweka Forest Park. Other discussions included; updates on recreational facilities, the Beech Mast project, the Kaweka contorta programme, Kaweka kiwi programme and the formation of the Sika Foundation.

OSPRI's contractor EPRO submitted their application to carry out aerial possum control in the Kaweka Forest park during the winter of 2016. The land the operation was to cover was all of the park East of, and up to the main range, including panpac's Kaweka forest.

At an OSPRI public information meeting held in Puketitiri on 27th May 2016, it was made clear that a large group of stakeholders believed their concerns were not being addressed. The KHLG submitted their concerns about the operation to OSPRI and DOC: KHLG response to DOC re OSPRI CNI 2016 operations. DOC-2842238

After considering public concern over the operation, DOC decided that the Kaweka East operation application would be declined until OSPRI had carried out a more comprehensive consultation process with affected parties.

As the Kaimanawa liaison group have similar concerns around the effects of OSPRI's possum control operations on sika deer hunting opportunities, it was decided that combined meetings would be held with both Kaweka and Kaimanawa liaison groups present to discuss the design of the TBfree programme and work with hunters to find ways to mitigate effects of these operations on hunting opportunities. The first of these meetings was held at the Turangi DOC office on the 8th December 2016. It was decided that this approach worked well as it allows both groups the opportunity to hear the same information. Similar meetings are planned to happen over the coming year.

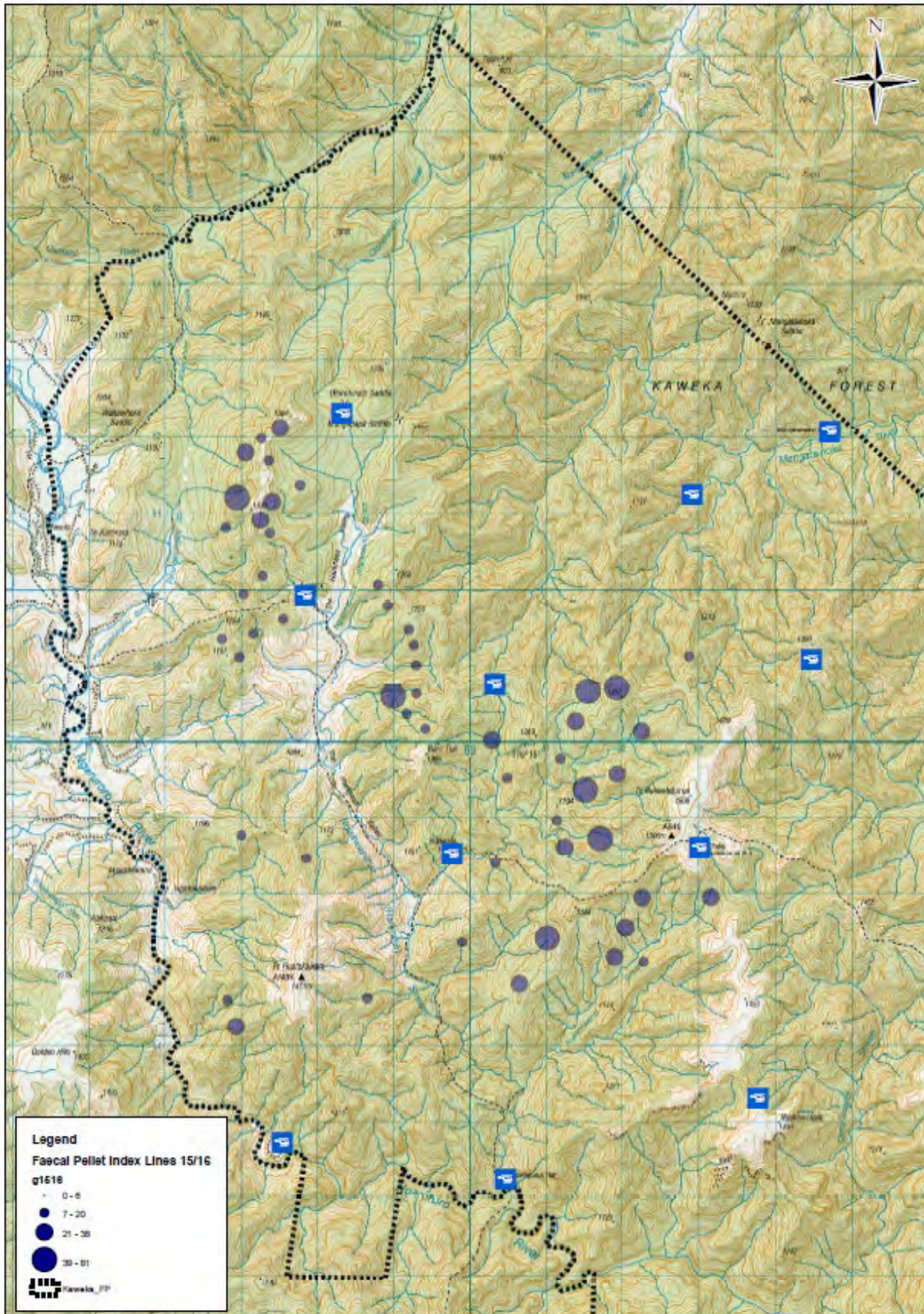


Map OSPRI's proposed Kaweka East operational boundary.

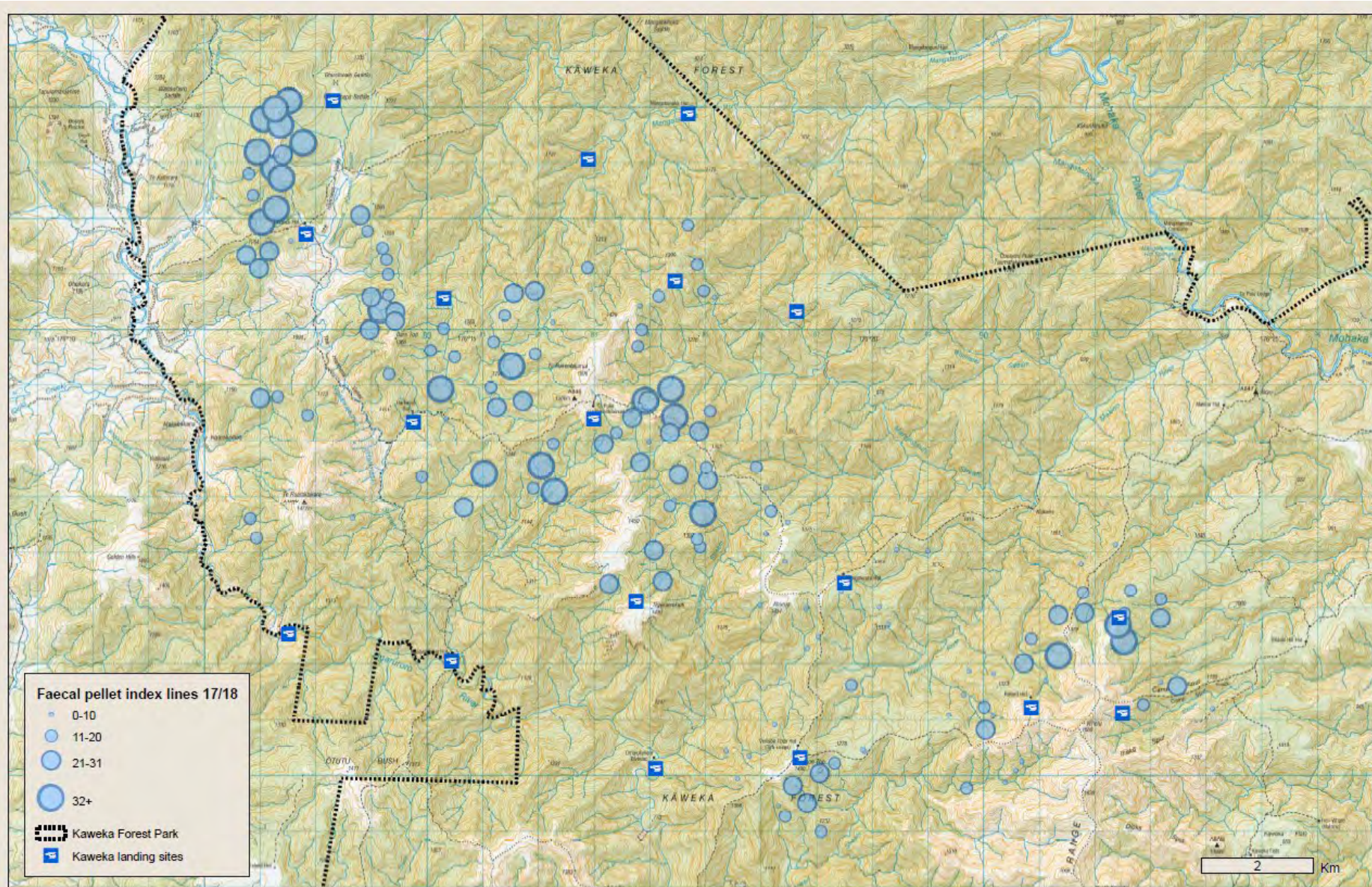
7. SUPPORTING DOCUMENTS

Document Title	Location
Mountain Beech forest dynamics in the Kaweka Range and the influence of browsing animals (Allen & Allen 1997)	DOCDM- 470377
Kaweka Mountain Beech Project Annual report 2012-2013	DOCDM- 1453036
Kaweka Mountain Beech Project Annual Report 2010-2011	DOCDM- 755502
Kaweka Mountain Beech Project Annual Report 2015-2016	DOCCM-2825102
Operational Plan 2015 – Sika Deer and Red deer control in the Kaweka Mountain Beech Operation	DOCCM-2306504
Operational Plan 2009 – 2014 – Sika Deer and Red Deer Control in the Kaweka Mountain Beech Operation	DOCDM-410423
Operational Plan amendments 2013-14 (amendments to DOCDM 410423)	DOC- 1453022
Kaweka Hunter Liaison Group meeting minutes July 2016	DOC-2836838
Kaweka Hunter Liaison Group meeting minutes Nov 16	DOC-2923278
Kaweka Hunter Liaison Group meeting minutes March 17	DOC-2991567
Kaweka Hunter Liaison Group response to OSPRI re 2016 operations	DOC-2842238
Kaweka East application assessment report	DOC-2786591
NZHunter magazine article. Dec15/Jan16 - Kaweka aerial deer control coming to an end. Dan Herries	DOC- 5466576
NZHunter magazine article. Feb/March 16 – Kaweka Mountain Beech Project, 18-year summary. Dan Herries	DOC -2829827
FPI Raw Data Worksheet	DOC-2737113
Protocol for estimating changes in relative abundance of deer in NZ forests using faecal pellet index (David M Forsyth, 2005)	DOC - 5466548
Consequences of Deer control for Kaweka mountain beech forest dynamics (2007)	DOCDM-457501
Kaweka Mountain Beech monitoring review Feb 2008 (Cathy Allen)	DOCDM-260492
Kaweka Deer pellet monitoring review Feb 2008 (Cathy Allen)	DOCDM-260491
Exclosure checks October 2016	DOC-2928058
Kaweka Forest Park vehicle and aircraft access map	DOC-5508023
Kaweka forest park deer hotspot map 16/17	DOC-5508014
'calling all sika deer hunters' brochure	DOC-5511444
Kaweka Forest Park deer hotspot map 15/16	DOC-2858715

Appendix 2. Kaweka Forest Park Deer Hot Spot Map. 2015/16 FPI results



Appendix 3. Kaweka Forest Park Deer Hotspot Map (NOTE: Map label displaying incorrect date, should read Faecal pellet index lines 16/17)



NZGD 2000 New Zealand Transverse Mercator
 Not for publication nor navigation
 Crown Copyright Reserved
 1:60,000
 Produced: 21/09/2017
 DOC, Geospatial Services



Kaweka Forest Park: Deer Hotspot Map