

**KAWEKA MOUNTAIN BEECH PROJECT  
ANNUAL REPORT  
2012-2013**

**Daniel Herries  
Department of Conservation  
Hawke's Bay Area Office**

## TABLE OF CONTENTS

<b>Summary</b>	<b>2</b>
1.0 Introduction	3
2.0 Aerial deer control	6
3.0 Vegetation monitoring	8
4.0 Deer density monitoring	11
5.0 Recreational Hunter Activity	12
6.0 GPS Tracking Sika	12
7.0 External engagement	15
8.0 Exclosure maintenance	16
9.0 Supporting documents	17

## SUMMARY

The objective of the 2012-2013 monitoring season was to gather information to understand the current state of the mountain beech forest and the impact of sika on the regeneration of the forest. The monitoring also involved collecting information to assess the effectiveness of deer control by aerial and recreational hunting. 2013 was scheduled to be a year to review the effectiveness of the control options and also the measure state of the wider mountain beech forest to assess the health of areas which received recreational hunting as the only form of control.

A great deal of data has been collected by DOC staff, volunteers, recreational hunters and casual contractors over this season. The following data sets collected will be explained and presented in this report:

- Aerial Deer Control – hind kills and stag sightings, effectiveness of control
- Vegetation monitoring – Focussing specifically within the mountain beech forest
- Faecal Pellet Index Monitoring – Understanding the changes in relative abundance of deer
- Recreational hunter activity – permits issued and helicopter concessionaire data
- GPS Tracking Sika – understanding how this data can fill information gaps with sika behaviour

Information was analysed and presented to the Kaweka Hunter Liaison Group on 8<sup>th</sup> March 2013 in order to gain acceptance of the information and also to initiate future management options of the Kaweka Mountain Beech Project for the next 3-5 years. The meeting was very productive with the liaison group accepting the information presented before them and the whole group agreeing on where the mountain beech issues have been resolved and unresolved through deer control (both aerial and recreational). As a result, an operational plan was agreed to for the next 3 years and will be discussed in this report.

Overall it has been a very positive year for the Kaweka Mountain Beech Project and it's relationship with recreational hunters, as more information comes to hand on both the sika herd and the state of the mountain beech forest, all interested parties are able to make more informed decisions on the best options for managing the sika-mountain beech issue.

## 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 (*Nothofagus solandri var. 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 (KFP) had a deer induced problem and that aerial hunting using DOC staff would be the method used to control deer numbers.

Aerial deer control commenced in 1998 over 11,386 ha and has involved a consistent effort of control every year for the period 01 October – 28 Feb. The deer control operation has had minor changes which took effect on 01 July 2009. The current Aerial Deer Control Area is 8,900 ha and the control season is 1 July- 28 February. Only hinds are targeted for control.

We have adopted an adaptive management approach to operational planning in which project objectives and operational results and outcomes will be periodically reviewed, and research undertaken, to progressively inform management decision making over time.

Vegetation (particularly mountain beech) monitoring is an important measure of success for this project. The mountain beech forest vegetation has been and will be consistently monitored to assess our outcome targets. Vegetation monitoring will continue at 5-7 yearly intervals. This year included the scheduled vegetation monitoring to assess the outcomes of this project.

This report presents field data and information collected over the 2012-2013 monitoring season for the following Targets and Objectives as described in Operational Plan – Kaweka Mountain Beech Project DOCDM-410423:

### 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 opportunities.

This will be achieved by:

- raising awareness of and improving access to information on recreational 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.

Recommendations have been made for future work and should guide future project coordinators or managers.

All objectives, performance measures, monitoring targets, and methods are as described in the Operational Plan – Kaweka Mountain Beech Project ([DOCDM-410423](#)). Any deviations from these guidelines are detailed in the text.

## **2. AERIAL DEER CONTROL**

### **Objective**

Control deer to densities that allow for adequate mountain beech regeneration

### **Result Target**

- Exceed 90% aerial cull kill rate of all hinds sighted per season
- Apply 50 aerial hunting hours to the treatment block

Monitoring the effectiveness of the operation will be achieved by monitoring the % reduction in deer density, measured using the change in FPI.

### **Method**

Aerial deer control was conducted using a .308 calibre semi-automatic rifle and a 12 gauge semi-automatic shotgun fired from a Hughes 500D/500E or Robinson R44 helicopter.

The aerial shooting team consists of four suitably trained and qualified DOC staff members. Generally two shooters will be used for any one hunt, although there may be occasions where only one shooter is used due to local weather conditions.

Aerial hunting takes place during the hours of dawn and dusk.

Aerial hunting occurred in the Harkness and Te Puke East block (aerial deer control block for 2011-2012 season) which has been pre-determined by DOC and the Kaweka Hunter Liaison Group before the shooting season commences. The public must be notified of any changes to the control area at least 6 months prior to the changes being implemented.

Control has suspended in the Mangaturutu\_VT and Ballard Blocks. Recreational hunters continue to target this particular area to ensure the current deer population remains at a similar level. Recreational hunters are also encouraged to hunt the aerial deer control block and compliment the aerial shooters work by controlling the stags.

All deer kills and sightings are recorded by the aerial hunting team and the information is presented to the public annually or as requested.

An agreement was made with the Animal Health Board for the aerial deer control operation to recover and store as many deer carcasses as possible for TB testing. The Animal Health Board has paid for the cost of the recoveries as this is often a significant amount of time and can not be absorbed by the operation if the targets are to be met.

Age, Sex, Species, Action (killed or seen) and GPS location is recorded for each deer encounter. A GPS track log is also kept for the duration of each sortie.

## Results

Aerial deer control continued targeting only hinds with 213 sika hinds shot and 2 sika stags shot. 38 aerial hunting hours were used, slightly less than the target of 50 hours. The drought was the major cause for the reduction in shooting hours as these extremely dry conditions are not efficient for aerial deer control.

Sorties	21
Sika Stag Killed	2
Sika Hind Killed	213
Red Hind Killed	0
Red Stag Killed	0
Total Deer Shot	215
Total Deer Seen	511
Total Hunting Hours	38
Mean minutes per deer	17.5
Mean cost per deer	\$235

Total deer kills increased this year, although this was because more effort was applied than last year, there was also a decrease in the cost per deer. This means this year was more efficient than last year which is due to the information gained from the GPS Tracking Sika Project.

A map showing deer kill locations is attached as Appendix 2

**40 deer were recovered during the year andASUREQuality, under contract to the Animal Health Board, autopsied these animals to check for the presence of Tuberculosis (TB). To date no TB has been detected in the carcasses submitted.**

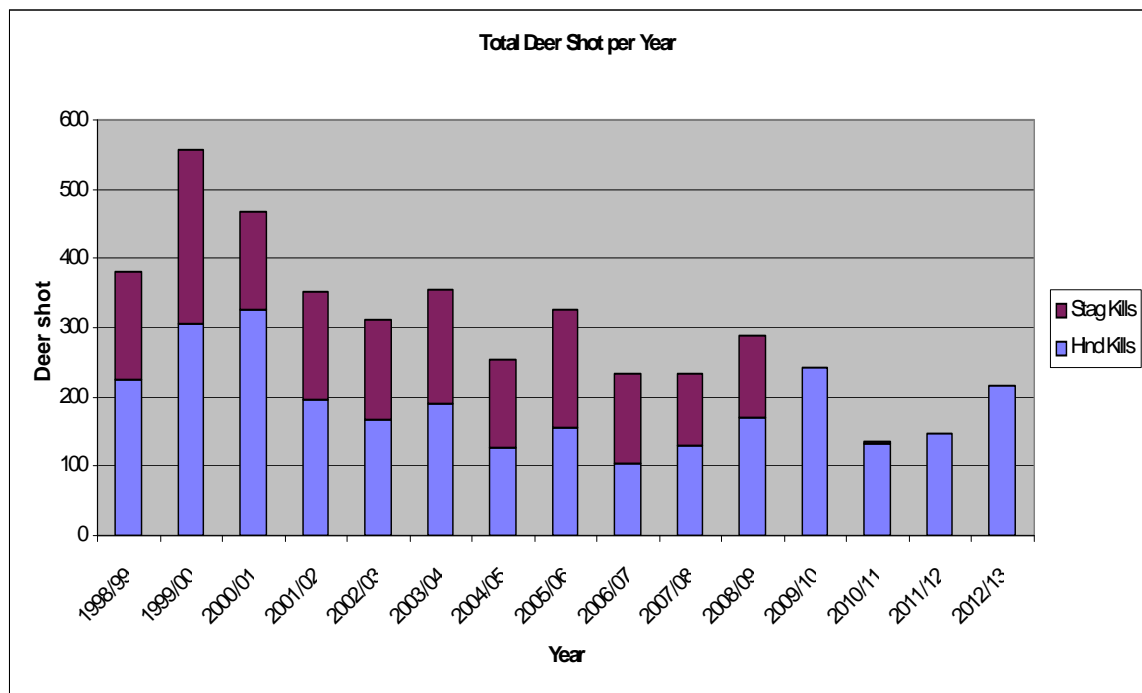
## Discussion

Aerial deer control operated in 8900 hectares of the Kaweka Forest Park during the period 1 July – 28 February, this area has received control since 2009 with the same conditions and these are:

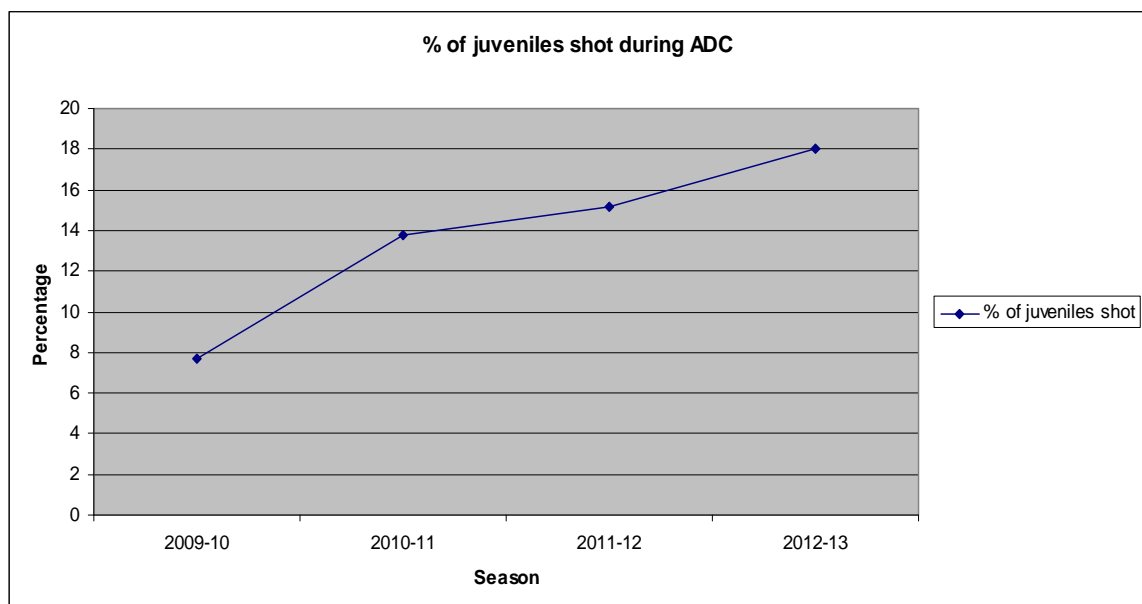
- Aerial shooting period is 1 July – 28 February
- Hinds only are to be controlled, stags locations are recorded with GPS and presented annually to recreational hunters
- 50 aerial hunting hours applied each year
- The area to receive control is agreed to by the Kaweka Hunter Liaison Group and well advertised prior to any control taking place

This season 213 sika hinds were killed as part of the aerial deer control operation, 212 sika stags were seen and recorded. No red deer were seen during the control.

Below is a graph showing the total number of deer shot by the aerial deer control team. Note the “hinds only policy” was introduced in 2009/10 season.



The graph below shows the increasing number of fawns that are being shot as part of aerial deer control (ADC). This is most likely due to the population being lowered which reduces competition for food which in turn leaves the remaining deer in better condition, as the condition of hinds improves, more hinds are getting in fawn therefore hunters are hearing more roaring in the deer control block.





### 3. VEGETATION MONITORING

#### Objective

Employ a vegetation monitoring programme to assess the objectives (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.*

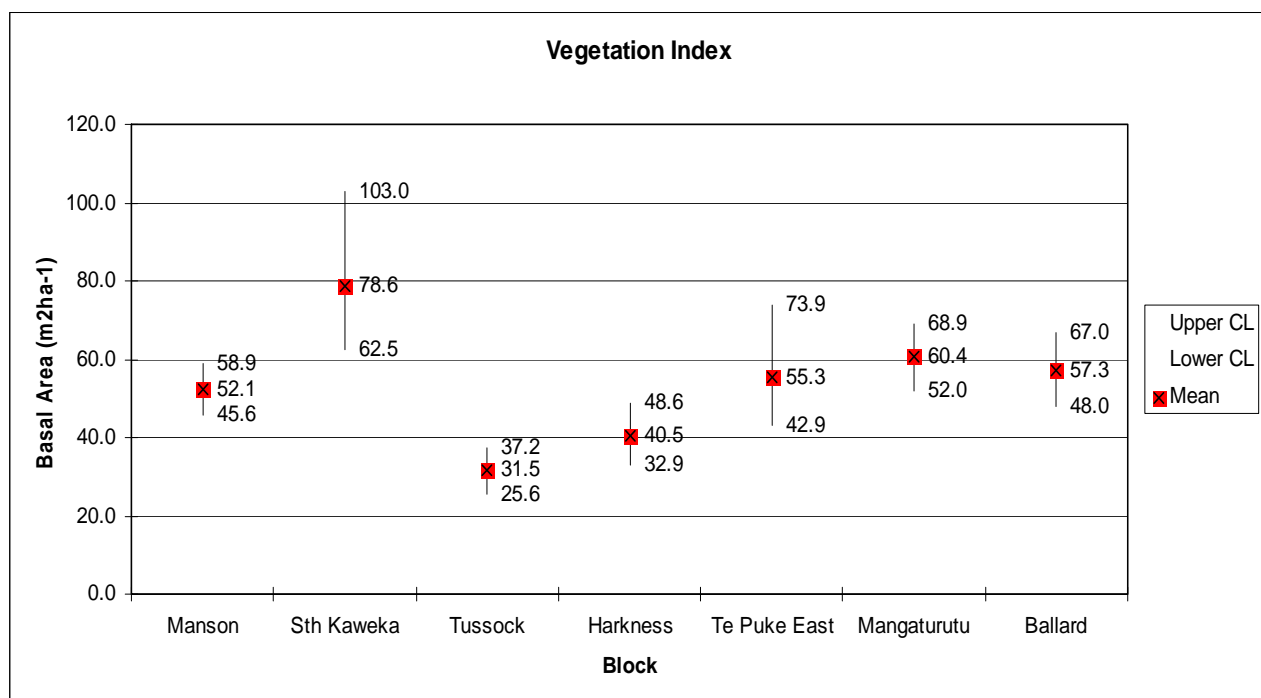
#### Monitoring Target

The vegetation monitoring component of the project is completed every 5 years and serves as outcome monitoring for the project.

The monitoring target is to measure 210 vegetation plots in order to give a vegetation index for each of the 7 different blocks within the Kaweka Mountain Beech Operational Area. This index informs decision makers of the mountain beech forest condition

#### Method

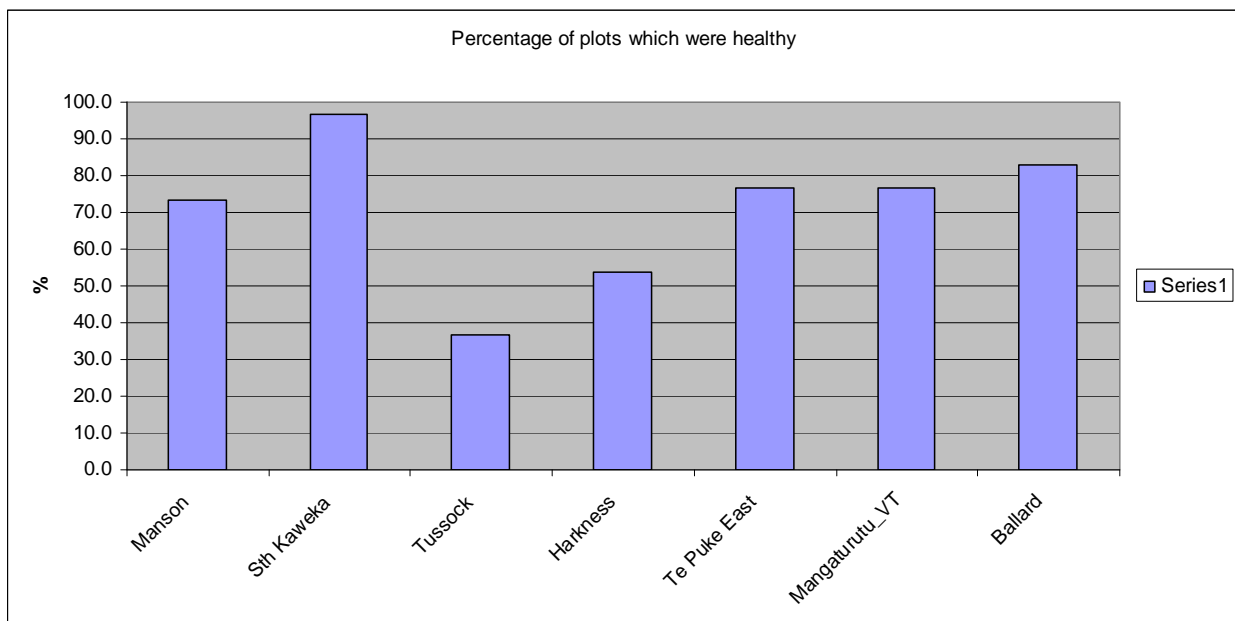
210 vegetation plots were measured this season in order to give a vegetation index for each of the 7 different blocks within the Kaweka Mountain Beech Operational Area. The index is specific to mountain beech vegetation and is displayed on the graph below. The index relates to basal area of mountain beech per hectare. A basal area  $\geq 44\text{m}^2/\text{ha}^{-1}$  is considered healthy for mountain beech forest.



From this data we can conclude that recreational hunters have controlled sika to a level which allows for adequate regeneration of mountain beech in the Manson and South

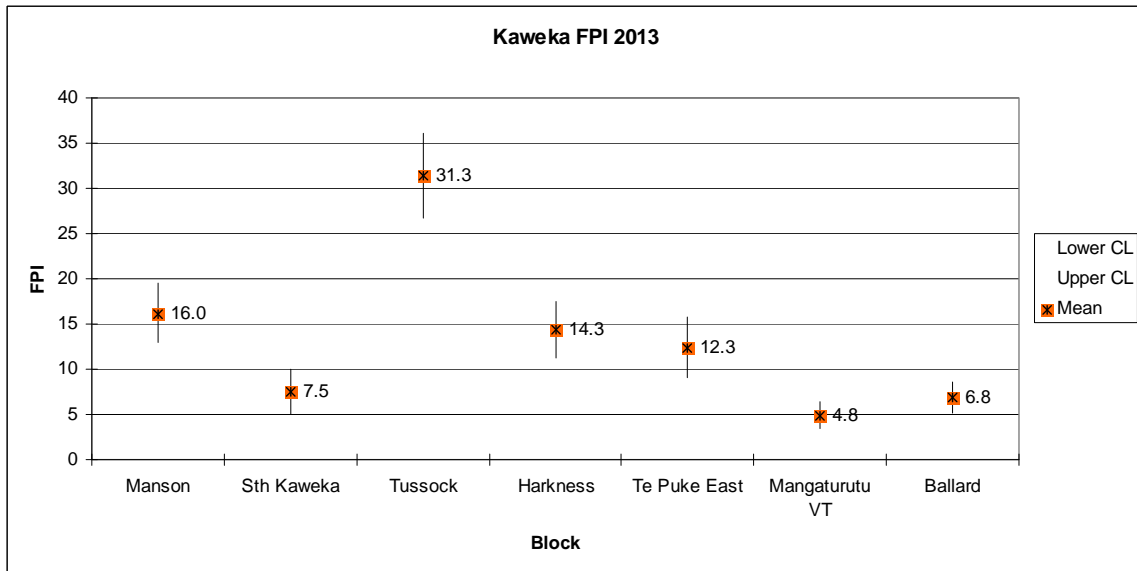
Kaweka Blocks. Ballard and Mangaturutu blocks had aerial deer control from 1998-2008, in 2008 ADC was suspended as regeneration of mountain beech looked sufficient in these blocks, recreational hunters were encouraged to keep the sika populations at those levels in order to keep the vegetation in that state. The vegetation monitoring indicates that mountain beech is still at an acceptable level. The Te Puke East Block has had considerable ADC and recreational hunting since 1998 until February 2013. This block has shown vast areas where sika have not allowed mountain beech to regenerate at fast enough rates, however this season's monitoring indicates that there is a sufficient regeneration response in later years and as long as deer abundance remains at the current level then the mountain beech should continue to recover. The vegetation in the Tussock and Harkness Blocks showed that the forest was not able to regenerate at fast enough rates, despite the large numbers of recreational hunters visiting these areas. Enhanced recreational hunting has been used for the past 15 years in these blocks through additional landing sites, access and hut upgrades however the vegetation has not shown the desired response by using recreational hunting alone to control deer numbers.

The following graph shows the percentage of plots which were classified as healthy within each block.



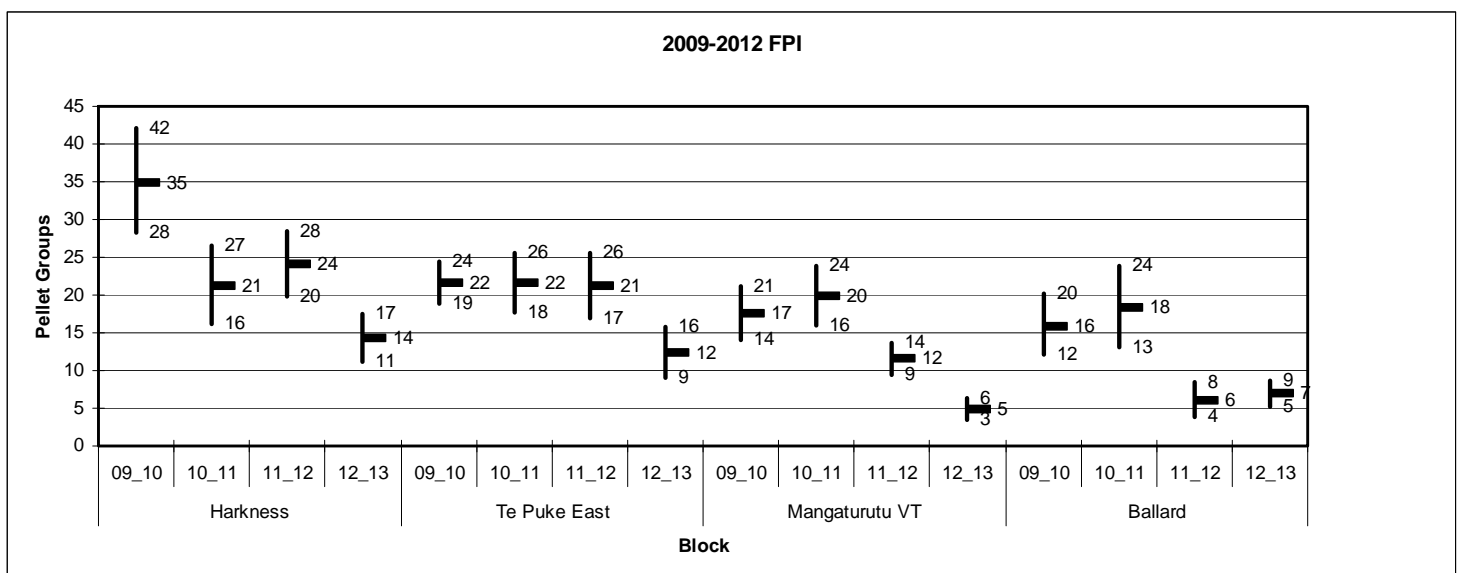
#### 4. FAECAL PELLET INDEX MONITORING

210 faecal pellet transects were measured this season in order to give a faecal pellet index (FPI) for each of the 7 different blocks within the Kaweka Mountain Beech Operational Area. These index and their confidence intervals are displayed on the graph below.



FPI is used to understand the correlation between relative deer abundance and vegetation health. When used this way they are a very useful tool for understanding where and when sika populations are low enough that vegetation should be able to regenerate adequately but also they indicate where sika populations are so high that they are likely to have significant impacts of mountain beech regeneration which in turn affects the health and condition of the sika population.

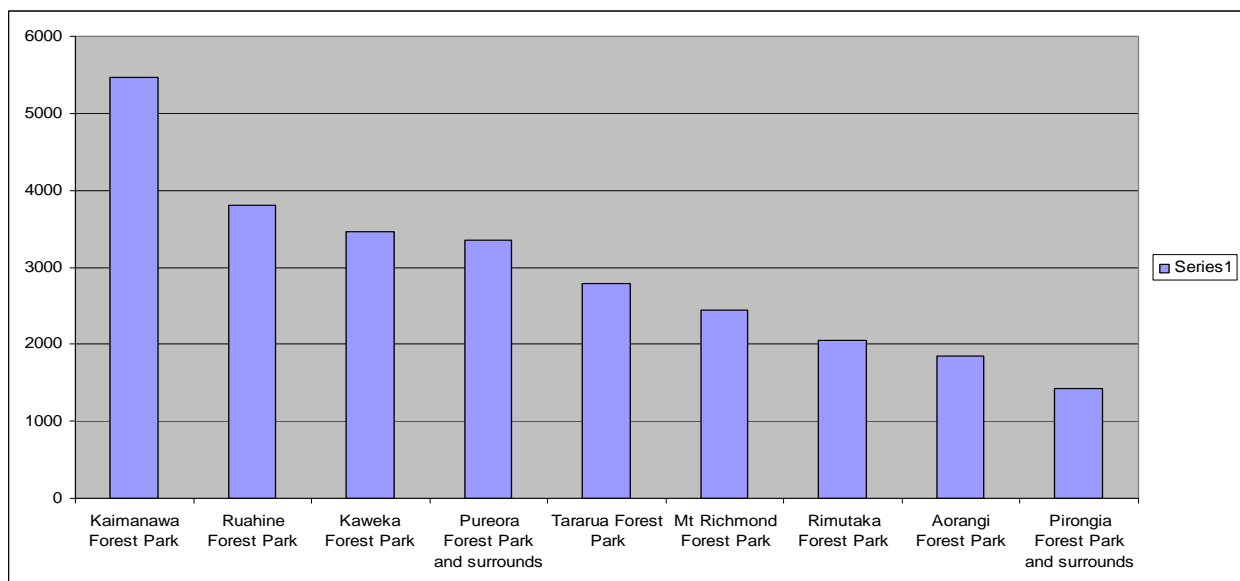
The following graph shows the change in relative abundance of deer in blocks which have received ADC at various stages. ADC was stopped in the Mangaturutu\_VT and Ballard Blocks in February 2010 so it is interesting to note that recreational hunters have been able to further reduce those populations once they were initially lowered through ADC. With information such as this, it is likely that recreational hunters can control sika populations provided they are not too high to begin with.



## 5. RECREATIONAL HUNTER ACTIVITY

Records from helicopter concessionaires from 2002 to 2012 were analysed this year to gain an understanding of trends for fly-in recreational hunters. The data showed that there is strong demand for backcountry accommodation throughout the Kaweka Forest Park and recreational hunters are certainly utilising these huts, bivouacs and campsites which are maintained by DOC. This is positive as the data shows that recreational hunters are very active in certain parts of the Kaweka Forest Park.

Data from the national hunting permit database indicates that the Kaweka Forest Park has the third most permits issued from all Forest Parks in NZ. This reinforces the demand from recreational hunters to hunt Kaweka.

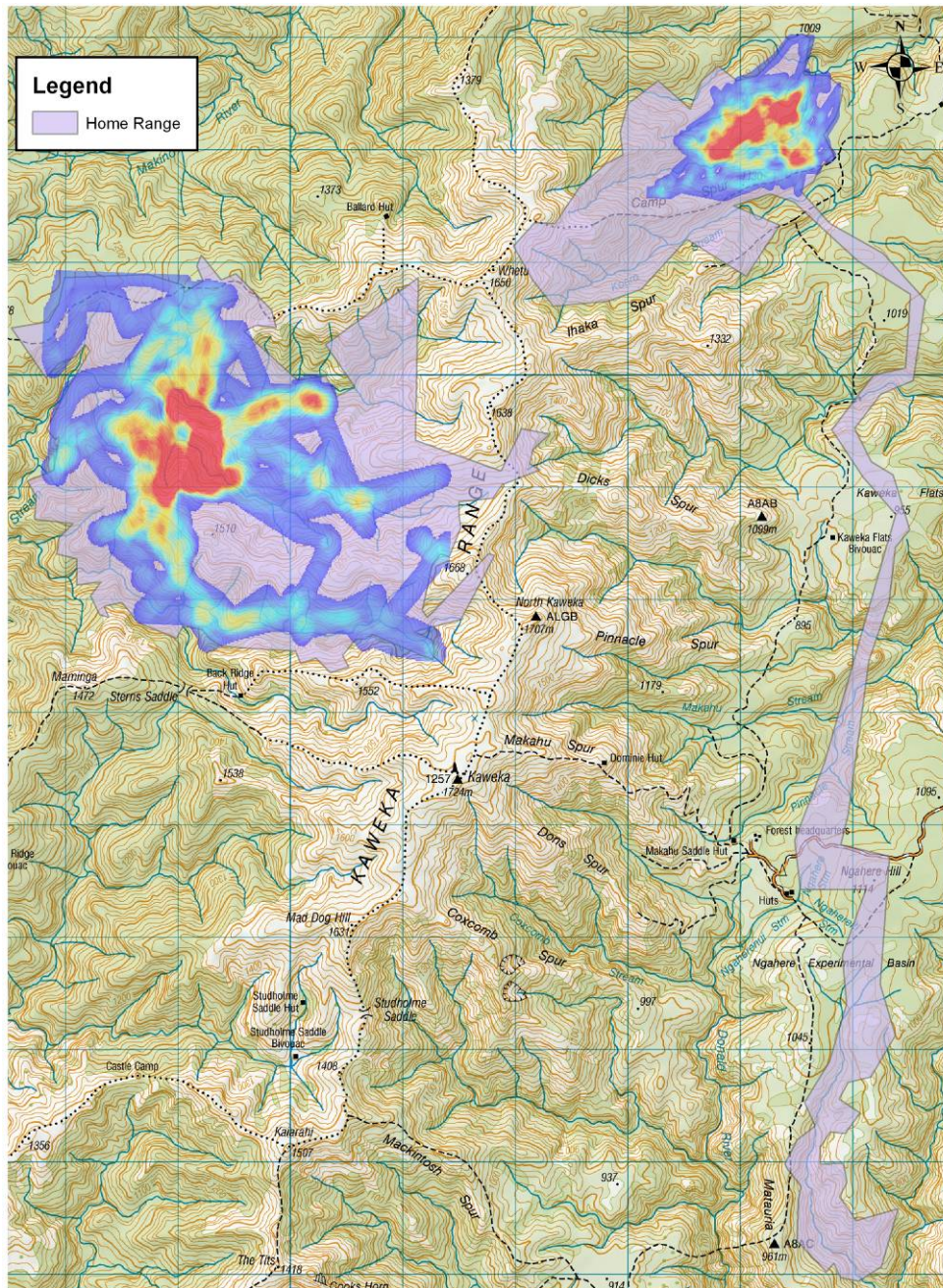


## 6. GPS TRACKING SIKA PROJECT

The field research part of the project is now complete and all of the GPS collars have been recovered and downloaded. A process is underway to analyse the data and a full report should be publically available later this year. So far the information we are gaining is showing some surprising results.

In summary the hinds had a mean home range of 120 hectares and the stags 550 hectares. Therefore a 1.2 km buffer would be required around an area to protect if hinds were targeted. Stags have different behaviour which means much larger buffers would be required if stags were targeted.

The following map shows the type of information recreational hunters will be interested in. The data is taken from two sika stags and shows the areas used most often (red areas) during the roar period, the light colours shows the full home range of each stag.



This is a great data set for recreational hunters to analyse and explore information that may be of specific interest to them, Hastings NZDA taking a great approach by getting their own GIS license and computer software so they can analyse data.

DOC is undertaking analysis that is specifically related to the original aims of the project and has limited time and resources to explore further into other aspects at this time.

**Aim:** to determine how time of day, weather, seasonality, population density, hunting pressure, sex, age and breeding cycles influence habitat use, dispersal and home ranges of sika deer in the Kaweka Forest Park.

The following map displays data from a sika hind in the Mangatainoka beech forest during Winter

Each dot represents a position that was recorded at 30 minute intervals over the Winter period.

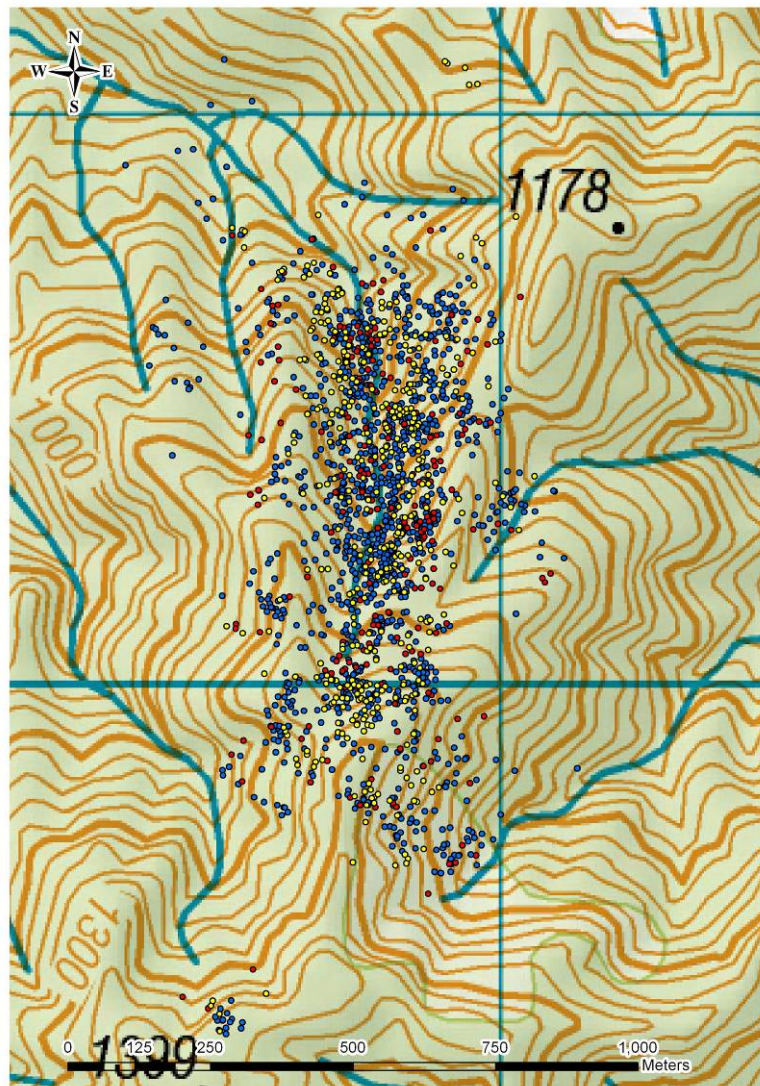
Yellow= morning

Blue = day

Red = evening

Night recording are not displayed here.

We use this information to show what terrain, aspect and vegetation types sika are living in at various times of year.



## **7. EXTERNAL ENGAGEMENT**

### **7.1 Kaweka Hunter Liaison Group**

The Kaweka Hunter Liaison Group (KHLG), representing local and national recreational hunting interests, meets at least twice a year. This provides a forum for regular discussions between park users and DOC to discuss the KMB Project and other issues relating to the Kaweka FP.

The KHLG is currently made up of the following people;

- Garry Ottmann – Game and Forest Foundation
- Dave Yule – NZDA, Hastings Branch
- Dustin Murdock – NZDA, Hastings Branch
- Greg Duley – NZDA, Napier Branch
- Troy Duncan – NZDA, Tutira Branch

A KHLG meeting was held at the Kaweka Café in March 2013 to discuss this season's findings and agree to changes in management and control regimes for the following year.

Below is a summary:

- Aerial deer control will continue to be suspended in Ballard and Mangaturutu\_VT Blocks
- Aerial deer control will now be suspended in Te Puke East Block and part of the Harkness Block, hind kills by recreational hunters will be monitored to ensure relative deer abundance remains at the same level.
- Part of the Harkness Block (an area that showed insufficient mountain beech regeneration) will continue to receive ADC from 1 July – 31 January.
- A 3,500 hectare block (Tussock Block) that had not received any aerial deer control will receive ADC from 1 June to 31 October. This timing has been used in attempt to understand whether both ADC and recreational hunting can be used together, but at different times of year, to efficiently lower a sika population.
- Only hinds will be targeted for aerial deer control. Stags will not be shot by the aerial hunters.
- Aerial deer control will be reduced overall from 8900 hectares to 6500 hectares and a reduction in approximately 10 aerial hunting hours will also occur.
- The aerial deer control period was reduced to allow recreational hunters to utilise key hunting periods. ADC will be carried out in the Tussock Block from 1 June to 31 October and the Harkness Block from 1 June to 31 January.
- There will be no ADC anywhere in the Kaweka Forest Park from 1 February to 31 May, this is the key time where recreational hunters are most active.
- Enhanced recreational hunting will continue to be applied in order to help recreational hunter be more successful and have more enjoyable hunting experiences. Additional form continued maintenance of current tracks, landing sites, campsites, huts and bivvys, there will be more detailed information shared with recreational hunters on where, when and how to best hunt sika specific to each location within the Kaweka Forest Park. Some addition tracks will be cut to allow better access for recreational hunters into areas which need deer populations reduced.

A review of the aerial hunting programme was undertaken in consultation with the Kaweka Hunter Liaison Group in March 2013. These changes came about on the basis of 15 years of data collection, recommendations from Landcare Research and close consultation with the various user groups.

## **7.2 Distribution of Information**

A range of methods is used to ensure that the Kaweka Mountain Beech Project data and key findings are distributed to recreational hunters annually. The ways in which information is currently distributed is:

- Updating the information displayed on hunting permits annually.
- Updating and adding information to the website <http://www.doc.govt.nz>
- Continue to submit information, maps and articles to the major hunting magazines
- Continue to display maps and information in the HB Visitor Centre and Puketitiri Field Centre.
- Continue to distribute season summaries and deer abundance maps to local branches of NZDA, hunting outlet stores,
- Continue to attend NZDA club meetings and discuss the project with members.
- Continue to distribute information to members on the projects mailing list.
- Continue to attend the Annual National Sika Show.

For example we annually provide our local NZDA branches with large A1 sized maps showing, all the previous seasons stag sightings, hind kills, lines with high deer pellet counts and designated helipads. This is a key step in building relationship with our local NZDA members as all our information we collect is shared with them.

## **8. EXCLOSURE MAINTENANCE**

### **Objective**

Maintain 5 20mx20m and 33 10mx10m deer exclosures to a deer proof standard. Check annually or as soon as possible following a severe weather event, repair as necessary.

### **Results**

- The majority of the exclosures were repaired and maintained by the deer pellet monitoring crew during the pellet monitoring season.
- 2 exclosures needed major repairs due to wind throw damage.
- Many of the exclosures require repair to bring them up to a more permanent deer proof standard (a result of many “patch-up jobs’ over the years).

### **Recommendations**

- Maintain 5 20mx20m and 33 10mx10m deer exclosures to a deer proof standard.
- Undertake permanent repairs on 8 of the exclosures (resources allocated in 2011-2012 business plan).
- Continue to utilise Puketitiri FC staff, pellet monitoring staff, volunteers and the aerial shooting team to complete annual exclosure checks.



## 9. SUPPORTING DOCUMENTS

<i>Document Title</i>	<i>Location</i>	<i>Comments</i>
Kaweka Deer FPI Data - Master	<a href="#">DOCDM-415847</a>	Used to input raw pellet count data to calculate FPI
Kaweka Total Deer Kills - Master	<a href="#">DOCDM-436492</a>	All raw deer kill data for GIS input
Kaweka Deer Aerial Control Total Data Worksheets	<a href="#">DOCDM-142266</a>	Initially developed by Ken Hunt
Operation Plan GPS Tracking Sika	<a href="#">DOCDM-617307</a>	For ADC team to record deer kill data
Consequences of deer control for Kaweka mountain beech forest dynamics (2007)	<a href="#">DOCDM-457501</a>	2007 Landcare Report LC0607/021
Mountain beech forest dynamics in the Kaweka Range and the influence of browsing animals. (1997)	<a href="#">DOCDM-470377</a>	1997 Landcare Report Science for Conservation:44
KMB Brief Key Facts	<a href="#">DOCDM-352532</a>	Key facts for the KMB project in bullet points
2010 Season Report	<a href="#">DOCDM-586798</a>	A summary of the 2010 monitoring season
KMB Check in and out form	<a href="#">DOCDM-379984</a>	Form used prior to any party entering the backcountry for KMB monitoring
K.M.B Emergency Procedures 2009	<a href="#">DOCDM-453885</a>	H&S information included
Kaweka Mountain Beech Exclosure Plots	<a href="#">DOCDM-138771</a>	Exclosure inspection details
Kaweka mountain beech monitoring review Feb 2008	<a href="#">DOCDM-260492</a>	Cathy Allen's vegetation monitoring review
Kaweka deer pellet monitoring review Feb 2008	<a href="#">DOCDM-260491</a>	Cathy Allen's deer pellet monitoring review
HB0806 Helicopter Hire For Aerial Culling	<a href="#">DOCDM-316694</a>	Tender documents for aerial culling contract
KMB Communication Plan Sept 08	<a href="#">DOCDM-359598</a>	Plan to communicate the major changes to the operational plan.