Threatened species protection in the Eglinton Valley

Annual Report 2010/11

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Department of Conservation
Te Papa Atawbai

Cover image –Graeme Elliott helping Liam Norris and Maki Kameyama release mohua (yellowhead) near Knobs Flat, October 2010 (G Hill).

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Summary

Good progress has been made towards outcome targets for threatened species recovery this season in the Eglinton Valley in Fiordland National Park, and annual targets have been achieved for key species including long-tailed bat, short-tailed bat, and mohua. Monitoring of threatened species indicates that bat populations have generally remained stable or increased, and have not suffered the substantial losses expected where predator control was not in place. This year video counts of short-tailed bat roosts recorded the highest count of bats in one tree so far since monitoring began in the valley.

The Department of Conservation undertakes continuous stoat control and periodic rat and possum control within the Eglinton Valley to protect a range of threatened species. The key benefit species present in the Eglinton Valley site are South Island long-tailed bat *(Chalinolobus tuberculatus),* southern short-tailed bat *(Mystacina tuberculata tuberculata),* mohua/yellowhead *(Mohoua ochrocephala),* and South Island kaka *(Nestor meridionalis meridionalis)* .

A total of 69 mohua were transferred from Chalky Island to the Eglinton Valley in late October 2010 to supplement the existing valley population. Many of these birds settled in the valley and paired up with other transferred birds or existing valley birds. At least 62 mohua fledglings were recorded following breeding during the 2010/11 season, leading to a total of at least 114 birds at the end of the season in the valley.

No rat control was required during the 2010/11 season as rat numbers remained low through the period. Predator densities remained generally low during 2010/11, and number of rats and stoats caught during the stoat control operation were fairly typical of levels following low beech seeding during the previous autumn. A considerable amount of beech seed was recorded in the mid and upper valley during autumn 2011, and rodent levels are expected to rise in response through winter and spring into the 2011/12 season.

Predator control and monitoring programmes between 2004 and 2010 have been funded as part of Operation Ark, an initiative designed to protect key threatened species at beech forest sites within the South Island. The 2009/10 season was the last year that funding came through Operation Ark, as maintenance funding for stoat control and rodent/mustelid and bat monitoring was permanently baselined to the Conservancies for following seasons.

Introduction

This report summarises the animal pest control and monitoring carried out in the Eglinton Valley between July 2010 and June 2011. Invasive animal pests are controlled to protect a range of threatened native species present in the valley. The long-term valley floor stoat trap line was maintained, and monitoring of mustelid/rodent abundance and threatened species survival was conducted.

The Eglinton Valley lies at the eastern edge of Fiordland National Park, starting 50 km north of Te Anau (Fig 1). The valley is glacially formed, with steep sided walls and a generally flat valley floor 500-1500 m wide. The Milford Road between Te Anau and Milford Sound travels through the valley for the majority of its length, providing good access.

The Eglinton Valley contains two threatened bat species- South Island long-tailed bat *(Chalinolobus tuberculatus)* and southern short-tailed bat *(Mystacina tuberculata tuberculata)*. Mohua or yellowhead *(Mohoua ochrocephala)* are also present. Other native species present that may benefit from predator control work include South Island kaka, yellow-crowned parakeet, black fronted tern, and South Island robin.

The forest canopy is predominantly made up of southern beech species *(Nothofagus* spp.*)*, with several large open grassland clearings on the valley floor. The mid and upper slopes tend to be dominated by silver beech *(Nothofagus menziesii)* in the upper valley, with mountain beech *(Nothofagus solandri* var. *cliffortoides)* being more common in the drier lower valley. Mature stands of red beech *(Nothofagus fusca)* tend to dominate the more fertile, warmer lower slopes and valley floor. Monitoring of the annual beech seedfall has been carried out in the Eglinton for several years, showing dramatic increases during mast years (e.g. 2000 & 2006), and generally low seed production in non-mast years. The seedfall trend in recent years has seen more frequent moderate and locally variable seeding (2009 & 2011).

Stoat control has been carried out in the Eglinton Valley in its current form continuously since 1998, and traps have been checked and rebaited four-six weekly. Rat control was first attempted in the Eglinton Valley during the 2006/07 season using a grid of bait stations to protect mohua, long-tailed and short-tailed bats across three small areas totalling 950 ha (Hill 2007). The rat control block was expanded between 2009 and 2011 to encompass an area of 4800 ha.

Rodent and mustelid abundance is monitored using standard tracking tunnel methods, and is typically carried out quarterly. Rodent tracking was increased to monthly checks from May 2011 onwards to monitor the potential rise heading into winter.

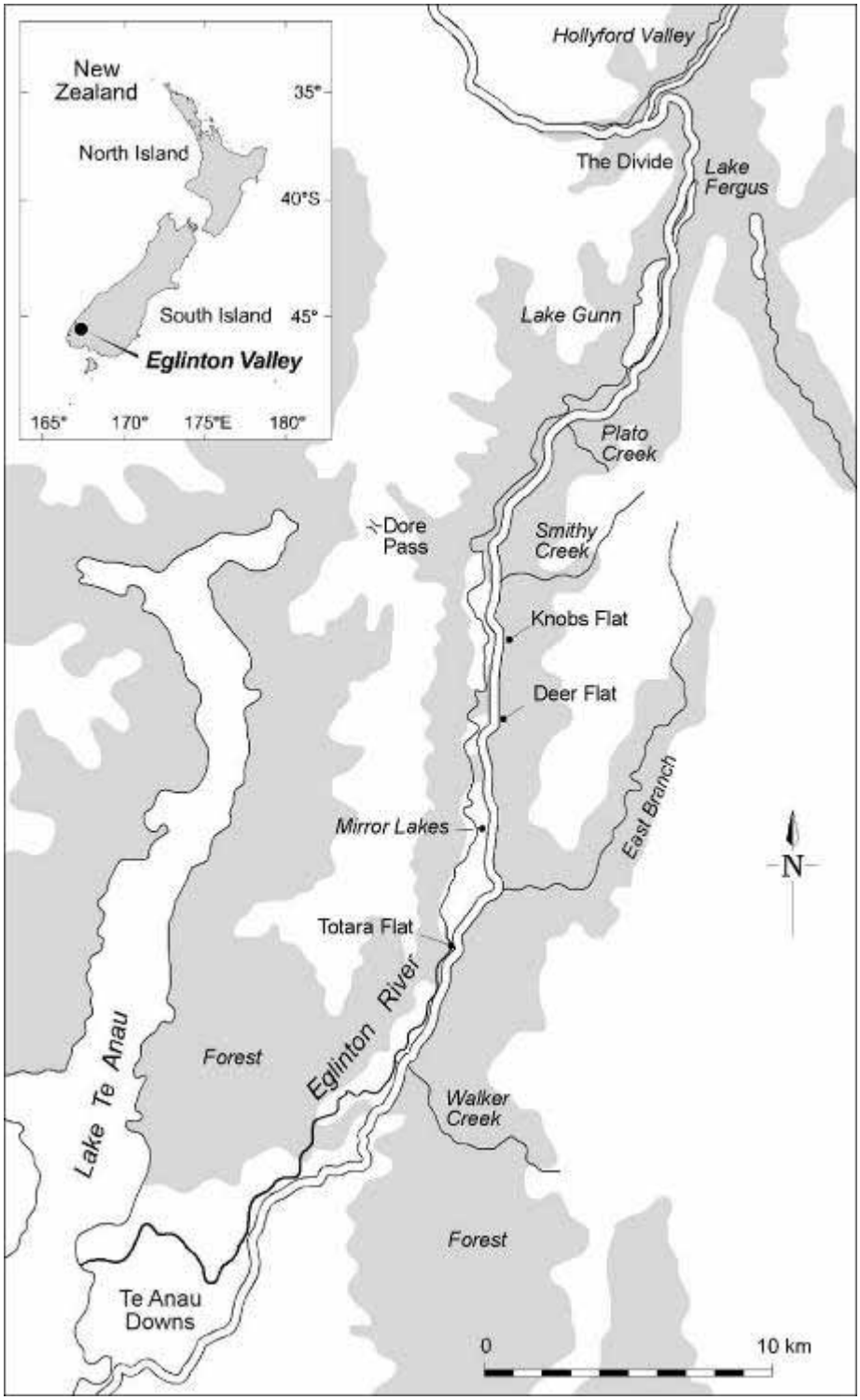

Figure 1- Eglinton Valley location, Fiordland National Park

Threatened Species Outcome Targets

Ten year conservation outcome (2020)

- Mohua- The Eglinton Valley will contain a population of at least 50 pairs of mohua
- Long-tailed bat- An intrinsic rate of increase of >5% is maintained for study colonies and adult annual survival is maintained at >75%
- Lesser short-tailed bat- The Eglinton Valley will contain a population of at least 2000 lesser short-tailed bats

Annual measures

- Mohua
  Reintroduced mohua survive
  Nesting success is >60%
  Adult annual survival is >50%
- Long-tailed bat
  Halt current decline and increase current population:
  Maintain current range
  Average annual survival >70%
- Short-tailed bat
  Increase current population:
  Average video counts maintained or increase by >1% per year

Predator Control Targets

Rat control

- ≤ 5% rat tracking rate inside control areas

Stoat control

- ≤ 20% of lines tracked by stoats

Possum control

- ≤ 3% RTC

Predictive monitoring

Annual seed fall of beech species is monitored during autumn using lines of eight seed collection trays located near Walker Creek, Knobs Flat, and Plato Creek (Fig 2). Collection data from Knobs Flat goes back to 1989 (Fig 2A); and additional lines at Walker and Plato Creeks were established in 2005. The amount of seed that southern beech species (*Nothofagus sp*) produce varies considerably from year to year. Generally there is a low amount of seed produced during autumn, however some years the amount of seeding substantially increases. Rodent levels in the forest generally fluctuate in response to the food provided by the annual beech seed crop, and heavy seeding years can lead to damaging irruptions of rats and mice through winter and spring. Monitoring the amount of beech seed that falls in autumn is a useful way to predict probably trends in rodent populations for the following season.

An extremely low level of seedfall was recorded during the previous season in 2010, with virtually no seed collected in the trays during the three month collection period.
A significant level of seeding was recorded in autumn 2011. The seed fall density was variable between the monitored sites, with far more seed produced in the mid and northern parts of the valley compared with the southern end. The amount of seed recorded at Knobs Flat and Plato Creek is sufficient to drive a rodent irruption based on previous experience at this site, and rodents are expected to increase through winter and spring 2011.

Table 1- Total number of seeds collected at each monitored site March-May 2011

	Walker Creek	Knobs Flat	Plato Creek
Red beech	700	4911	7255
Silver beech	158	4325	2155
Mountain beech	20	334	312
TOTAL	**878**	**9570**	**9722**

Table 2- Total seeds m^2 per site March-May 2011

	Walker Creek	Knobs Flat	Plato Creek
Red beech	313	2192	3239
Silver beech	71	1931	962
Mountain beech	9	149	139
TOTAL	**392 seeds m^2**	**4272 seeds m^2**	**4340 seeds m^2**

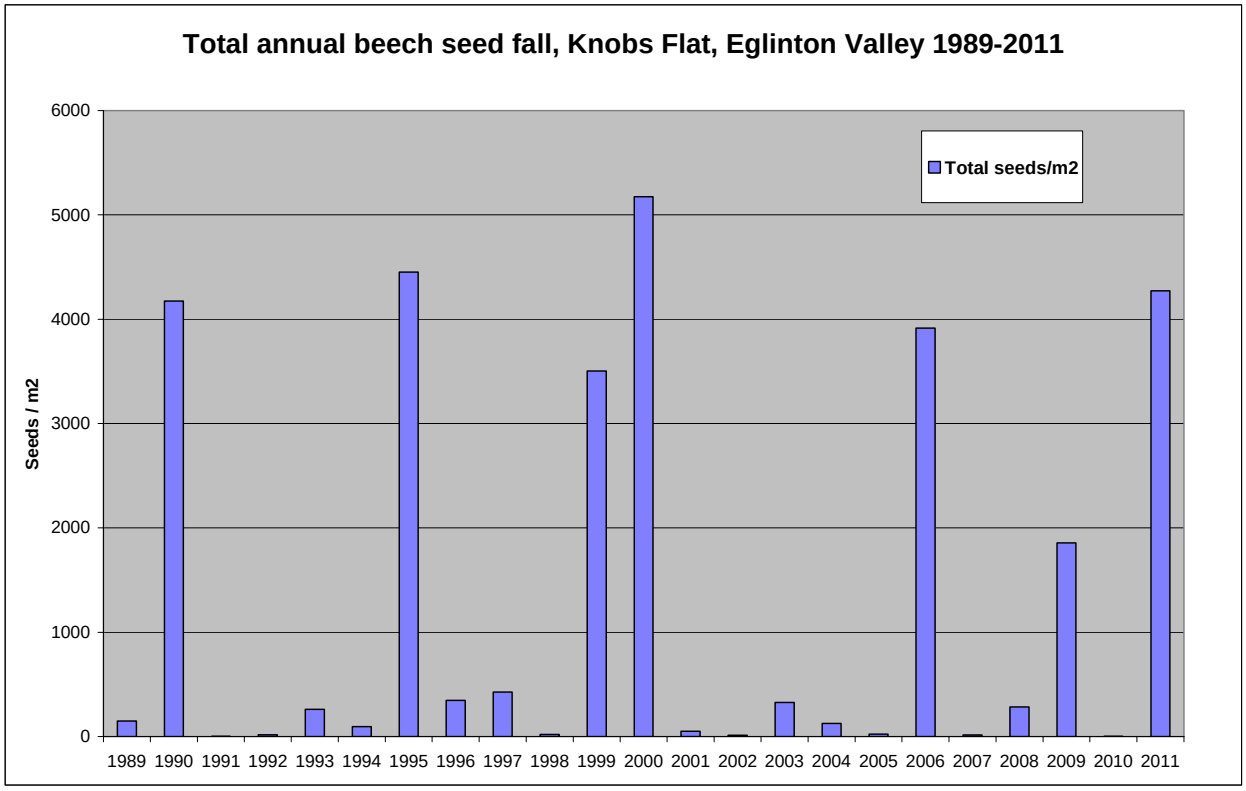

Figure 2A- Annual beech seed fall monitoring results at Knobs Flat, central Eglinton.

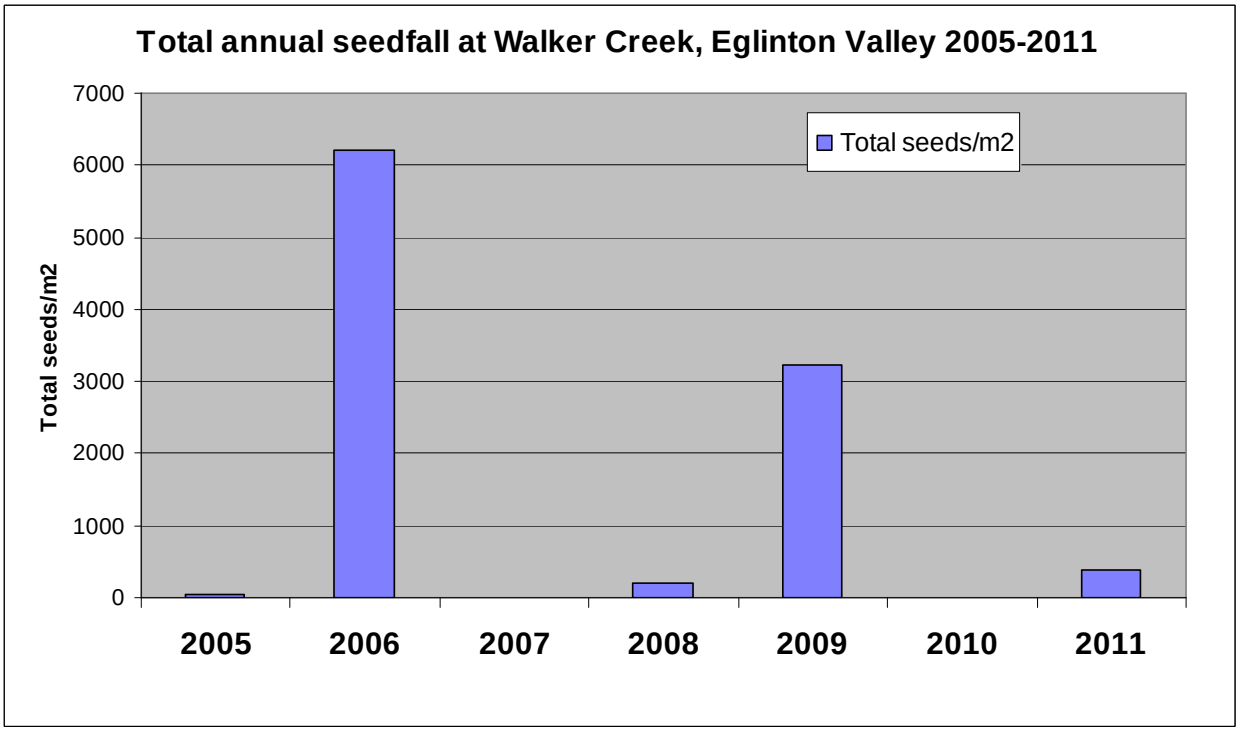

Figure 2B- Annual beech seed fall monitoring results at Walker Creek, southern Eglinton.

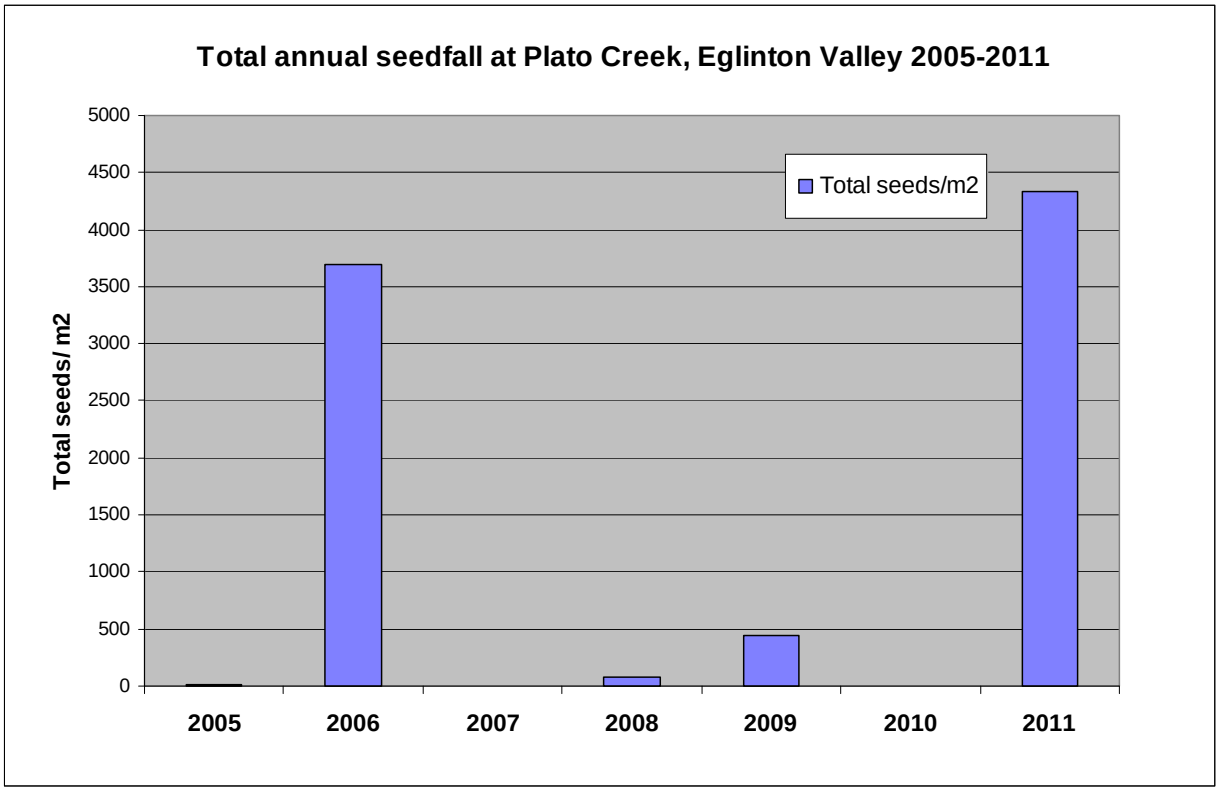

Figure 2C- Annual beech seed fall monitoring results at Plato Creek, northern Eglinton.

Figure 3- Moira Pryde with seed collection tray, Eglinton Valley

Stoat Control

Stoat control in the Eglinton Valley during the 2010/11 year consisted of 314 wooden tunnels containing either two stainless DOC traps, two Mk VI Fenn traps, or one stainless DOC trap. Tunnels are spaced 150-200m apart from the National Park boundary to 1 km past the Divide, a distance of approximately 41 km (Appendix 3). Traps were checked and re-baited nine times during the 2010/11 season, approximately 6 weekly, and monthly through the summer months. Traps were rebaited each time with a hen's egg and a piece of rabbit meat or venison.

This year was the first season that the trap servicing was tendered out to a trapping contractor. Dean Hansen completed eight trap check rounds between October 2010 and May 2011, while the first check of the season was completed by DOC staff in August.

Sixty two new single stainless DOC-200 traps were installed in October 2010 to extend an existing stoat trap line up Mistake Creek (Fig 4), and to increase the trap density around Walker Creek, Knobs Flat, and Plato Creek. True Travel Ltd also donated a further 30 DOC-200 trap tunnels that are planned to be installed during the 2011/12 season.

The replacement of the old Fenn traps with stainless DOC series traps continued during the year. Approximately 10% of tunnels still contain old Fenns at the end of the season, and these are planned to be changed over to stainless DOC traps during the 2011/12 year.

A total of 87 stoats and 140 rats were caught in the traps during the 2010/11 season, which is fairly typical of a normal year (Fig 6 & 7). The monthly capture breakdown is presented in Appendix 4.

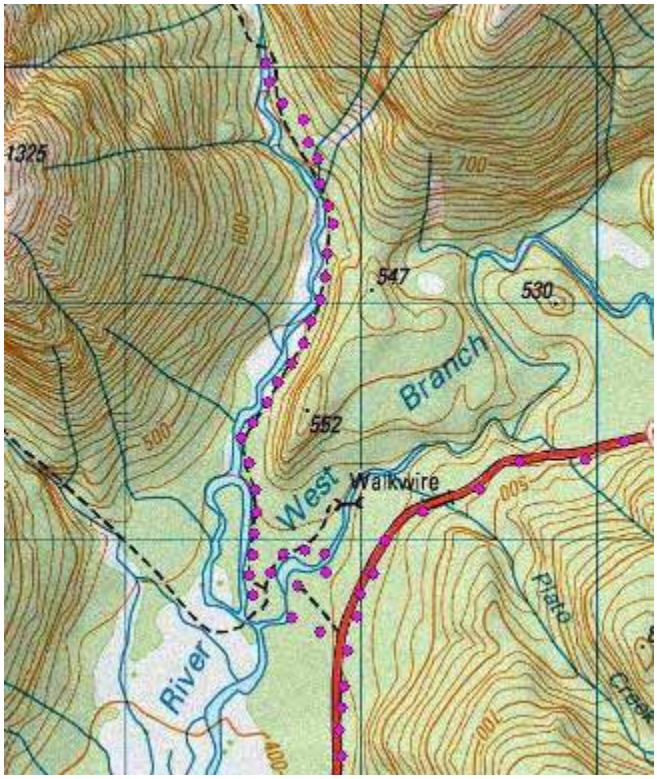

Figure 4- The extended stoat trap line up Mistake Creek in the northern end of the valley consisting of DOC-200 trap tunnels at 100 metre spacing.

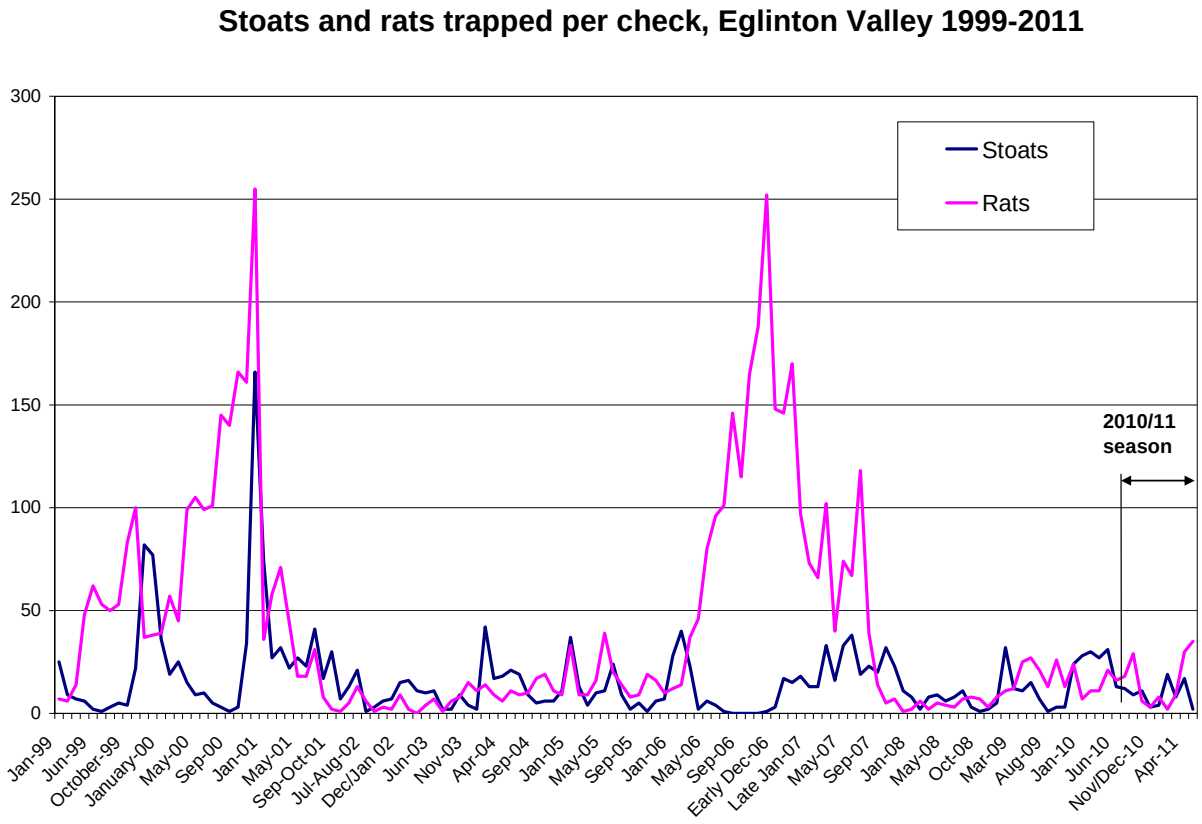

Figure 5- Total stoat and rat captures per trap check, 1999-2011

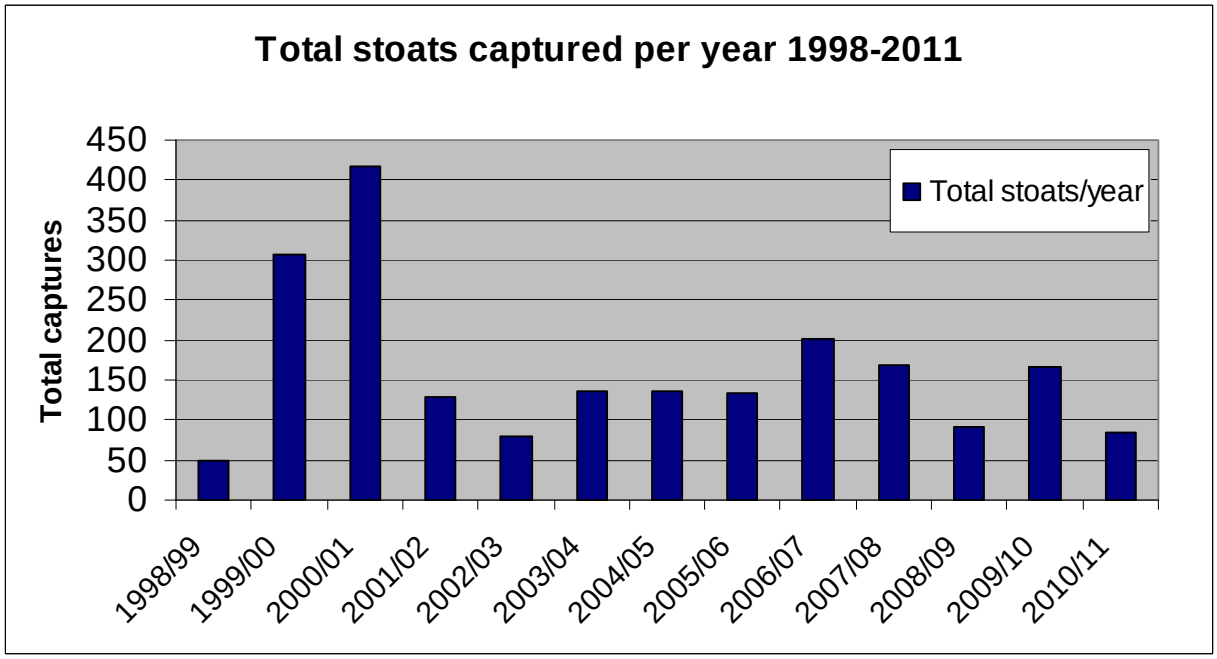

Figure 6- Total annual stoat captures (July-June), 1998-2011.

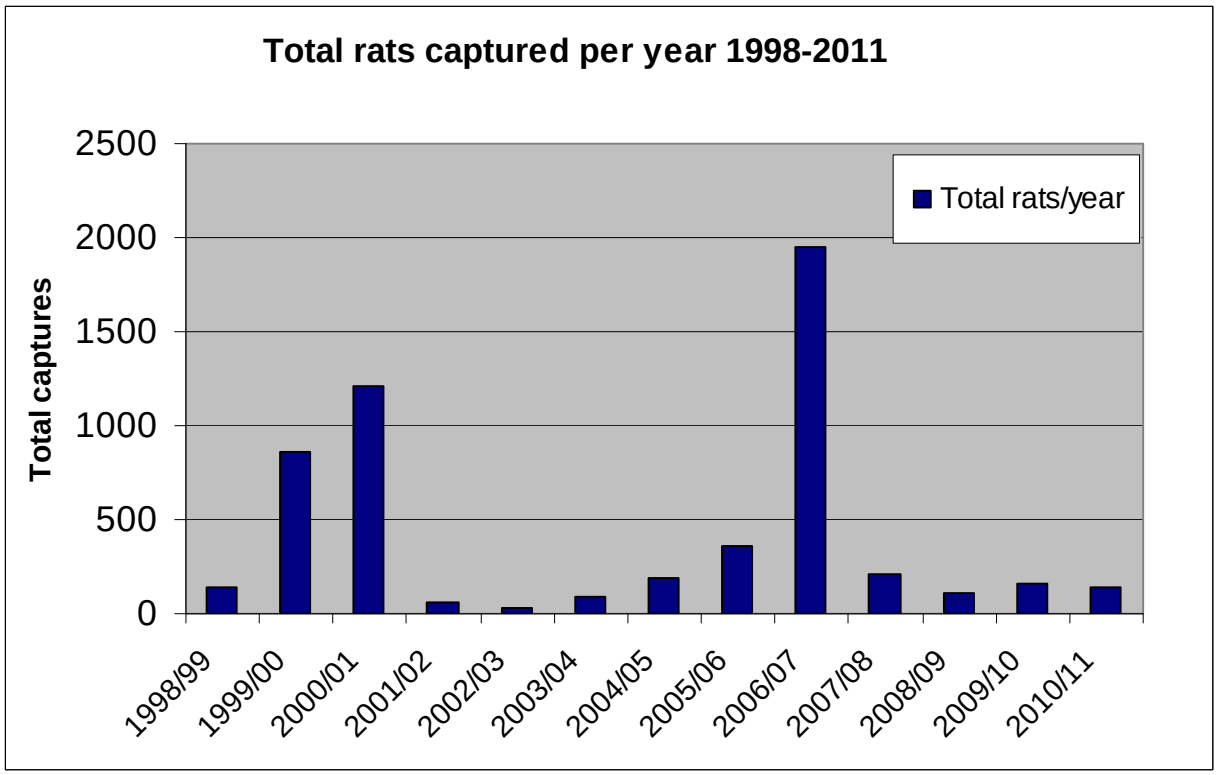

Figure 7- Total annual rat captures (July-June), 1998-2011.

Rat control

Rat and mouse numbers fluctuate in southern beech forest in response to food availability, generally beech seed. Periods of high rat numbers are damaging to a variety of native species, and substantial losses of bats, mohua, and other small forest birds have been recorded following rat irruptions (e.g. 1999-2001, and 2006-07). There was a very low level of beech seed recorded during autumn 2010, and rodent levels in the valley remained low through winter, spring, and summer of the 2010/11 season., and no rat control was required. The level of beech seeding recorded during autumn 2011 in the mid and northern end of the valley (Fig 2A & 2C) is substantial and suggests that there is sufficient seed available to drive an increase in rodent numbers heading into winter, and that rat control will be required during the 2011/12 season.

In anticipation of rat control being required during the next year, the bait station area was expanded by 1450 ha to fill in gaps between the existing blocks. Stoat and Track Ltd were awarded the tender to mark and install bait stations in three parts of the valley- true right south of Deer Flat; true left Wesney Creek to East Branch; and true left Cascade Creek to Lake Fergus. The total area of 100 x 100m bait station grid now covers 4800 ha of the lower and mid forested slopes; containing a total of 5300 Mini-Philproof stations (Appendix 2A & 2B). This expansion was funded by the Area possum control budget as the bait station network will be used for ongoing possum control at the same frequency as when rat control is required.

Cat control

Wild cats have been present in the Eglinton Valley in low to moderate numbers for several years, and infrequent localised attempts to live capture them in cage traps have been made. Cats have also been captured in stoat trap tunnels as non-target by-catch since the trapping programme began. This season was the first year a concerted effort has been made to initiate a wild cat trapping programme.

In December 2010 16 cat kill-trap sets were installed and their maintenance added to the stoat trap servicing schedule. Cat traps were installed spread between the National Park boundary and Smithy Creek, in areas where cat sign had previously been reported. Two styles of kill-traps were set up- nine double Conibear traps under Philproof covers (Fig 8, Twizel style, DOCDM-339829); and seven modified Timms traps (DOCDM-339852). Both designs are considered current Best Practise options and have passed NAWAC tests for cats. Traps have been baited with fresh rabbit meat.

It is planned to continue running the current cat traps plus install more next season, including some Belisle Super-X 220 traps set in 'submarine' or 'chimney' tunnels (DOCDM-339850).

Table 3- Cat trap capture results December 2010 – June 2011

	CAT	HEDGEHOG	POSSUM	STOAT	SPRUNG
'Twizel' Conibear n = 9	4	2	1	2	1
Timms n = 7	1	1	0	0	1
TOTAL	5	3	1	2	2

Figure 8- Philproof cover containing two Conibear traps inside.

Predator monitoring results

Monitoring of rodents and mustelids is carried out using a network of tracking tunnel lines following the standard protocol of lines of ten tunnels 50 metres apart described by Gillies & Williams (2005). All predator monitoring results achieved the targets set out in the Introduction section of this report.

Table 4- Average tracking tunnel monitoring results 2010/11

Month	Rats % of tunnels tracked	Mice % of tunnels tracked	Stoats % of lines tracked (10 lines)	Number of TT lines run
Aug-10	1%	10%	0%	23
Nov-10	1%	1%	0%	29
Feb-11	0.5%	0.5%	10%	29
May-11	2%	1%	0%	29
June-11	5%	4%	-	28

Full tracking tunnel results are available in DOCDM-74961.

Outcome Monitoring

Short-tailed bats

Annual monitoring of short-tailed bats was undertaken during January 2011 by Te Anau Area and DOC Research & Development (R & D) staff. A total of 226 new bats were PIT tagged during the 2011 season, bringing the total number marked to 1065 since the tagging programme began in 2006. Automatic data loggers were used to record PIT tagged bat activity at selected roost sites. Initial indications are that short-tailed bat survival between 2010 and 2011 has been high. A population estimate will be calculated using mark-recapture methods after the 2012 monitoring is complete, however the initial survival analysis shows low survival (53%) in 2008, likely to be related to the high rat numbers in 2006/07and high survival in the other years. Recapture rates were consistently high for all years (M. Pryde *pers comm.*).

Video counts of bat exiting roost cavities were also undertaken during the 2011 season. A total of nine video counts were made at two known communal roost trees across the river from Knobs Flat (M31 & M32). A total of 101 short-tailed bat roost trees are now known within the valley, mostly between Wesney Creek and Lake Gunn. The highest video count of bats exiting a single roost tree was recorded during the 2011 season at 1423 (Fig 9). See Edmonds (2011) for more details and Appendix 1 for roost locations.

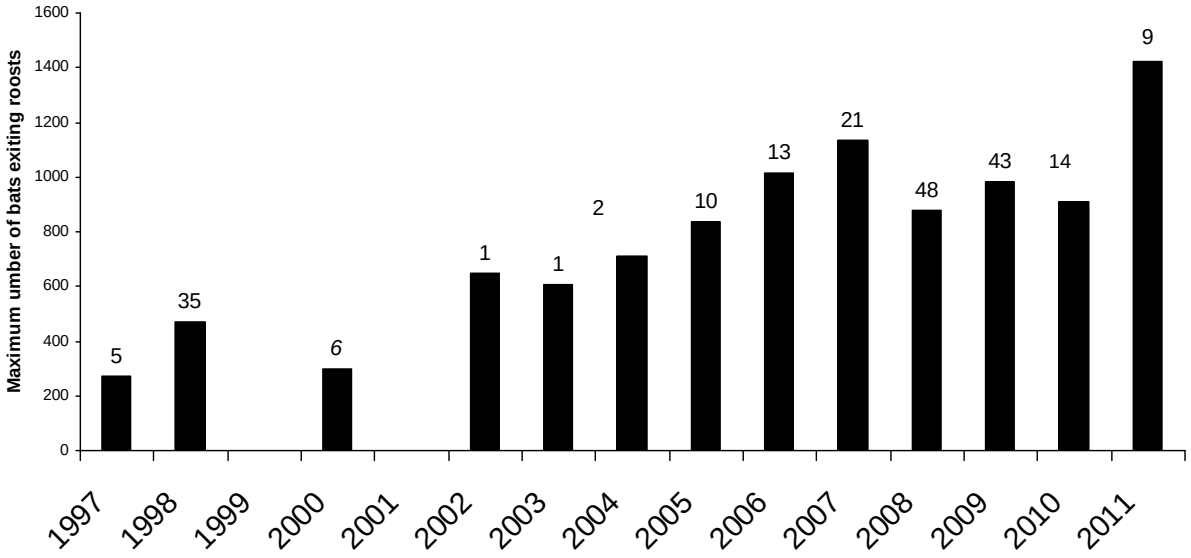

Figure 9- Maximum number of ST bats exiting roosts during video count monitoring 1997-2011. Numbers above bars indicate total number of video counts conducted each year.

Long-tailed bats

Annual monitoring of long-tailed bat groups within the Eglinton Valley continued during January and February 2011. Data has been analysed by Program MARK using multi-strata models with time, age and sex included in the model (Pryde 2011).

Initially the data was analysed with all the sub-groups together and then it was divided into sub-groups. The results reported are only for adult females.

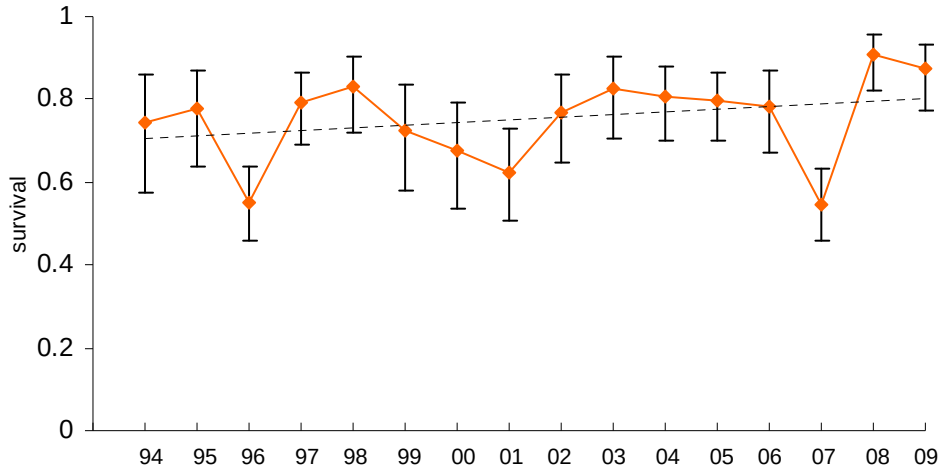

Fig 10- Long-tailed bat survival data for all groups studied between 1994 and 2009

The overall upward trend gives some cause for optimism if pest control continues. The declines in 1996, 2000-2001, and 2007 are all related to rat irruptions following heavy beech seeding.

The following graphs (Fig 11-13) show the results for individual social groups – note that Group 2 (park boundary south of Walker Creek) was lost after 2002 as it appeared the numbers became too small to be viable and some of the bats joined up with Group 1.

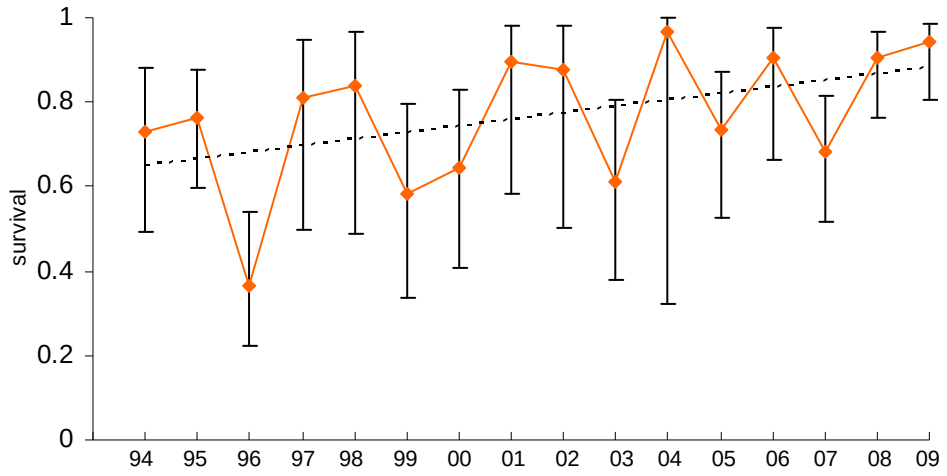

Fig 11- Long-tailed bat survival for Group 1 at Walker Creek

Group 1 (Walker Creek) shows a similar pattern to the combined groups with an increasing survival trend, except for the 2003 -2006 time period where there is some unexplained variability in survival. Rat control was in place at Walker Creek in 2006 and 2009.

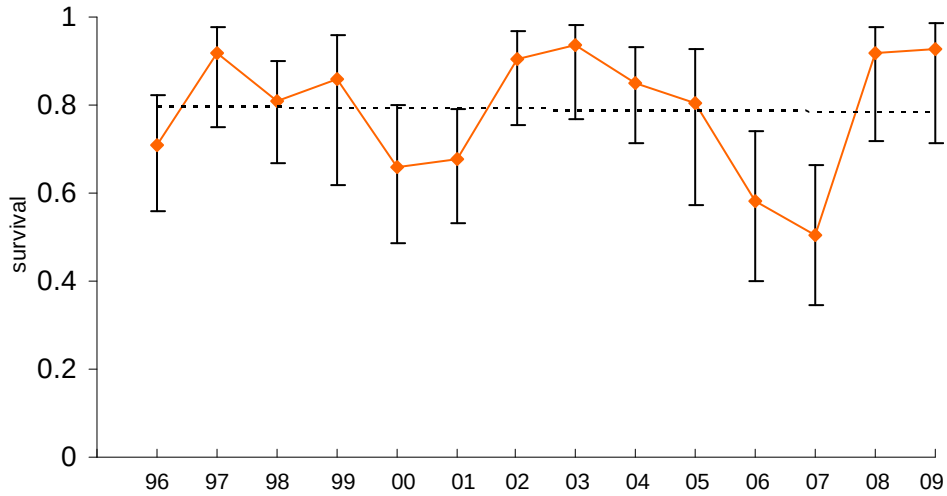

Fig 12- Long-tail bat survival for Group 3 at Mackay Creek

Monitoring of Group 3 at Mackay Creek began in 1996. The results show a decline in 2000, 2001 and again in 2006/2007, which directly correlates to years when rat and stoat numbers were high in the valley. The overall trend in this group over this period was neither increasing nor decreasing. There was rat control at this site in 2009 only.

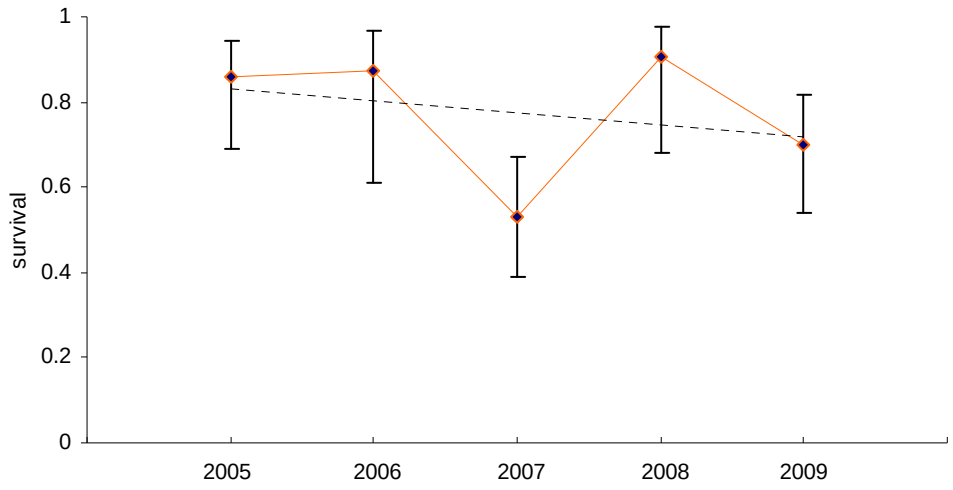

Fig 13- Long-tailed bat survival data for the Knobs Flat group

Monitoring of the Knobs Flat group commenced in 2005 and the results show a decline in 2007 following a rat irruption and an overall decreasing trend over this period. Rat control is now in place at this site from 2011 onwards which should improve survival and lead to an increasing trend over time.

The results for a three monitored groups strongly suggest that controlling rat irruptions when required is essential to maintain stable or increasing bat populations. Roost locations are shown in Appendix 1.

Mohua

This season was an exciting year with the transfer of 69 mohua from Chalky Island in southwest Fiordland to the Eglinton Valley in October 2010. The transfer was organised by the Mohua Recovery Group and Te Anau Area staff, and was made possible with funding from the Mohua Charitable Trust. All birds were caught on the island and then released at Kiosk Creek the same day. The transfer was to supplement the existing small mohua population that was present in the valley prior to the release (18 known birds at the start of the season).

Results

DOC R & D staff monitored the mohua breeding season following the release. Of the release birds, at least 34 were confirmed to have settled in the valley. In total there were 26 pairs found, of which 23 pairs attempted to breed. There were 30 nesting attempts recorded, producing 62 mohua fledglings during the 2010/11 season. Of the breeding pairs, six were original valley/valley bird pairings, 12 were new release/release pairings, and five were mixed valley/release pairs. The first nests were found on 29th October, and the last pair was still nesting in March after re-nesting.

Breeding pairs were spread between Wesney Creek and the top of Lake Gunn, generally within one km either side of the road. After the release and subsequent breeding there were a total of 114 known mohua at the end of the season 2010/11. A full description of monitoring results is available in van de Wetering (2011).

Budget 2010/11

Salary (Part of two staff)	$31,000
Wages	$2,500
Trapping contractor	$2,300
Trap bait	$1,400
Computer lease	$1,800
Field equipment & safety gear	$1,700
Travel costs	$300
Cat traps	$1,500
TOTAL	$42,500

Plans for 2011/12

- Continue stoat trapping. Trap checks will be tendered out to contractors and 9-10 trap rounds will be made during the year.
- Lay out 30 donated stoat trap tunnels in priority areas.
- Install at least 12 new cat traps in areas of previous cat sign or sightings.
- Finish replacing the last of the old Fenn traps with new stainless DOC traps.
- Continue to monitor beech seed fall amounts between February and May annually.
- Continue to monitor rodent levels using tracking tunnels quarterly as a minimum, and more often if rat control is possibly required.
- Initiate rat control within the 4800 ha bait station block if beech seed fall and rodent monitoring indicates that a rat irruption is likely to occur.
- Continue to monitor mustelid levels using tracking tunnels quarterly. The value of continuing this will be assessed at the end of the 2011/12 year.
- Continue to monitor short-tailed & long-tailed bats, and mohua (combined efforts of Te Anau area staff and DOC Research & Development staff).

Acknowledgements

A large number of people have been involved with the Eglinton Valley for several years across a variety of projects. Thanks are due in particular to Colin O'Donnell, Peter Dilks, Terry Greene, Moira Pryde, Lynette Hartley, and Jo Hoare from the DOC Southern Regional Science Centre. Dan Palmer and Iris Jacobs put in many long hours on the monitoring programme based at Knobs Flat for several months this season.

Te Anau Area staff who have contributed to the programme this year included Shinji Kameyama, Keri Antoniak, Erina Loe, Hannah Edmonds, Warren Simpson, Lindsay Wilson, Jane Tansell, and Linda Kilduff.

Dean Hansen was contracted to do most of the stoat trap checks through the season, and contractors from Stoat and Track Ltd completed the bait station extension layout. Thanks to Martin Sliva from True Travel Ltd who donated 30 stoat trap tunnels that will be laid out in the valley during the 2011/12 season. Thanks also to PC Taylor from Knobs Flat Accommodation for his ongoing support and assistance with many aspects of the programme over the years.

Thanks to Nigel Babbage and the Mohua Charitable Trust for sponsoring the transfer of 69 mohua from Chalky Island to the Eglinton in October 2010. Many of the transferred birds went on to successfully breed in their first season in the valley.

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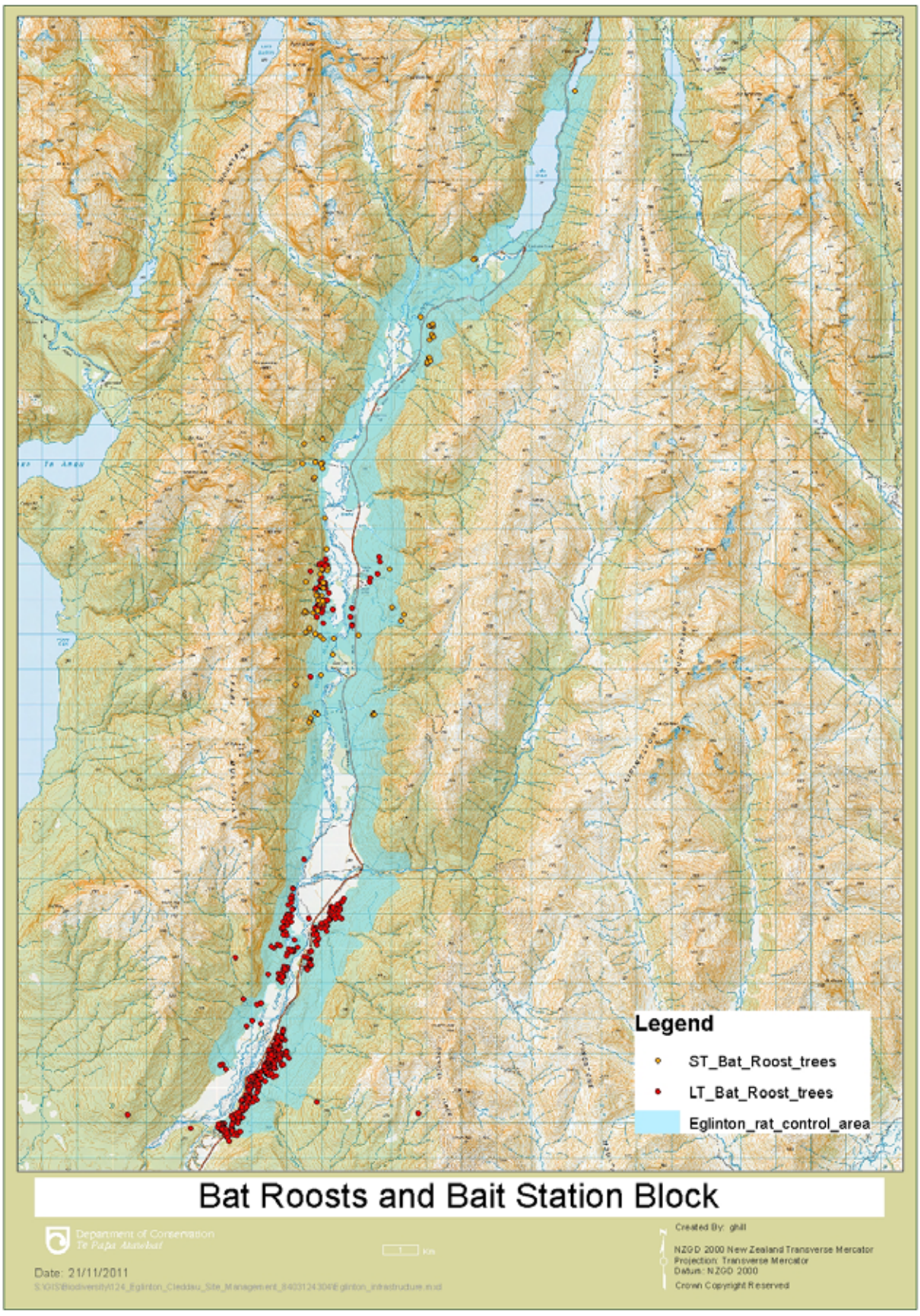
Pestlink report reference- 1011TEA10

Appendix 1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LT_Bat_Roost_trees
Eglinton_rat_control_area
Bat Roosts and Bait Station Block
Department of Conservation
Te Papa Atawbai
Date: 21/11/2011
Created By: ghill
NZGD 2000 New Zealand Transverse Mercator
Projection: Transverse Mercator
Datum: NZGD 2000
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Appendix 2A


Northern Bait Station block & rodent monitoring lines
Date: 21/11/2011
Created By: ghill
NZGD 2000 New Zealand Transverse Mercator
Projection: Transverse Mercator
Datum: NZGD 2000
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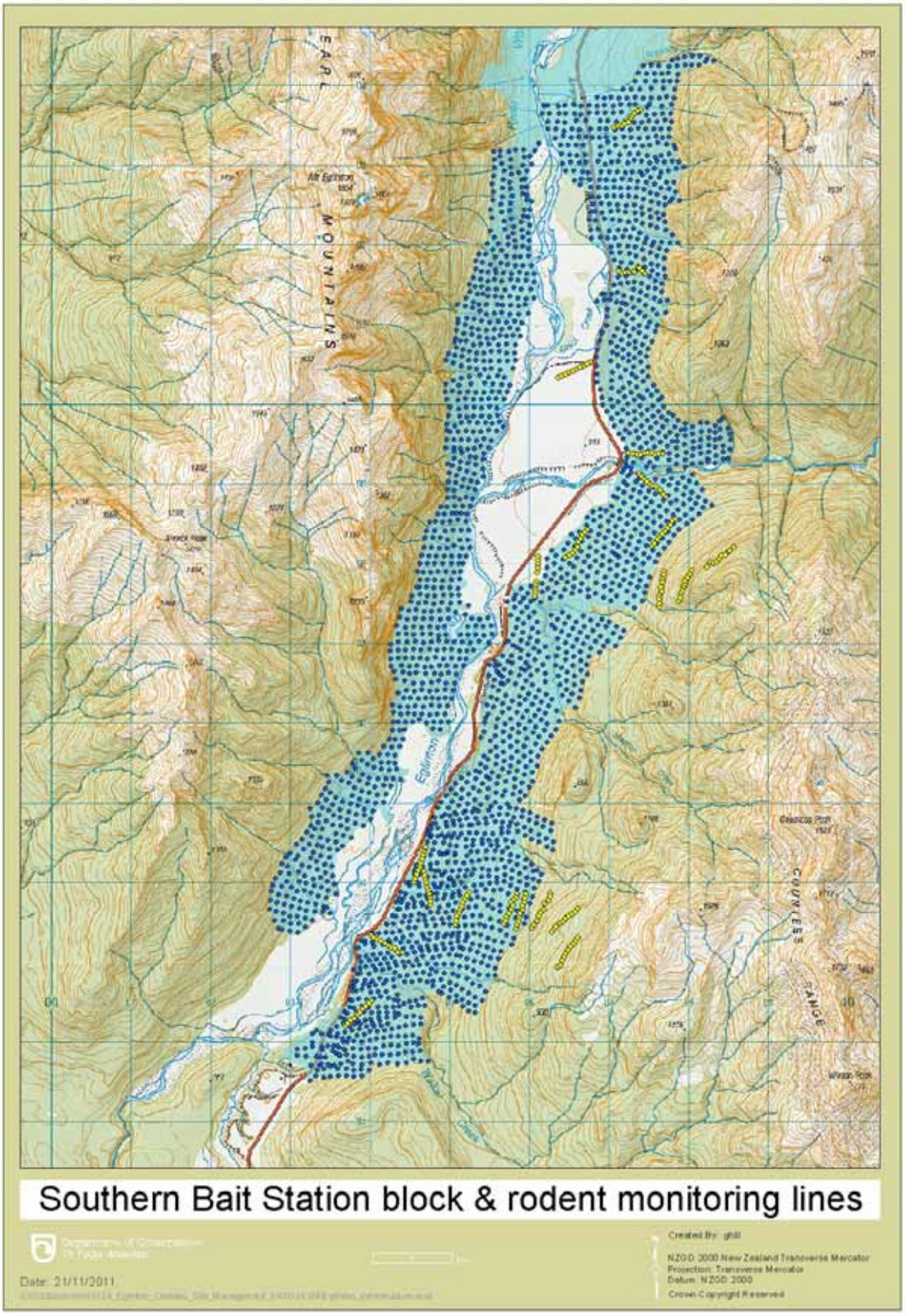
Appendix 2B


EARL MOUNTAINS
Mt Egmont
Egmont
CRAIGIEBURN RANGE
Southern Bait Station block & rodent monitoring lines
Date: 21/11/2011
Created By: ghill
NZGD 2000 New Zealand Transverse Mercator
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Datum: NZGD 2000
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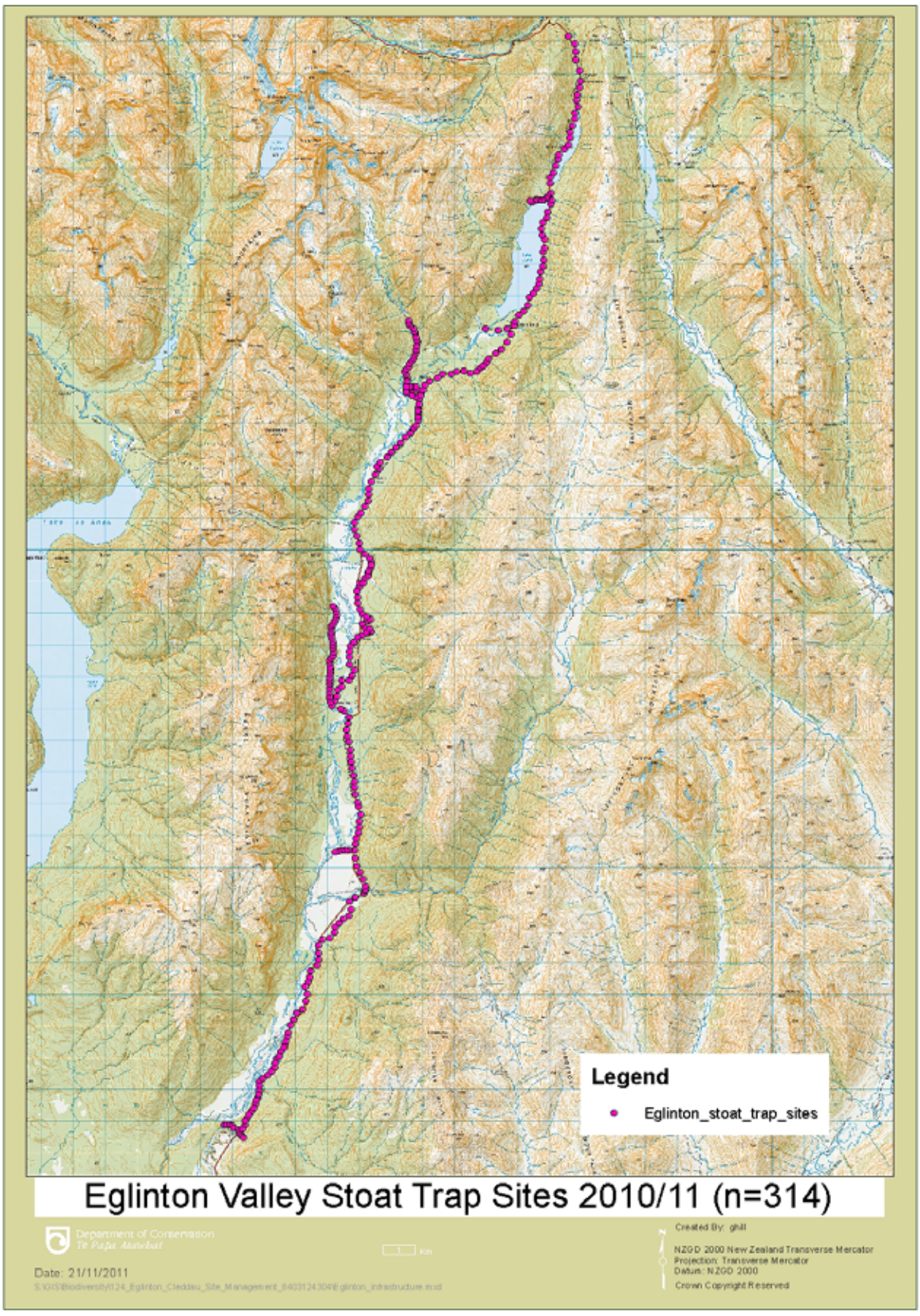
Appendix 3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Department of Conservation
Te Papa Atawbai
Date: 21/11/2011
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NZGD 2000 New Zealand Transverse Mercator
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Appendix 4

Stoat trap capture results 2010/11

MONTH	STOAT	RAT	WEASEL	CAT	FERRET	OTHER*
Jul/Aug-10	12	18	4	2	0	2
Sept/Oct-10	9	29	2	0	0	0
November-10	11	6	0	0	0	2
December-10#	3	3	0	0	1	6
January-11	4	8	0	1	1	4
February-11	19	2	1	0	0	5
March-11	9	9	0	2	2	5
April-11	17	30	0	3	0	4
May-11	3	35	0	1	0	1
TOTAL	**87**	**140**	**7**	**9**	**4**	**29**

*Other includes hedgehog, possum, bird, or rabbit. Full details are recorded in DOCDM-212559.

Cat traps installed in December 2010.