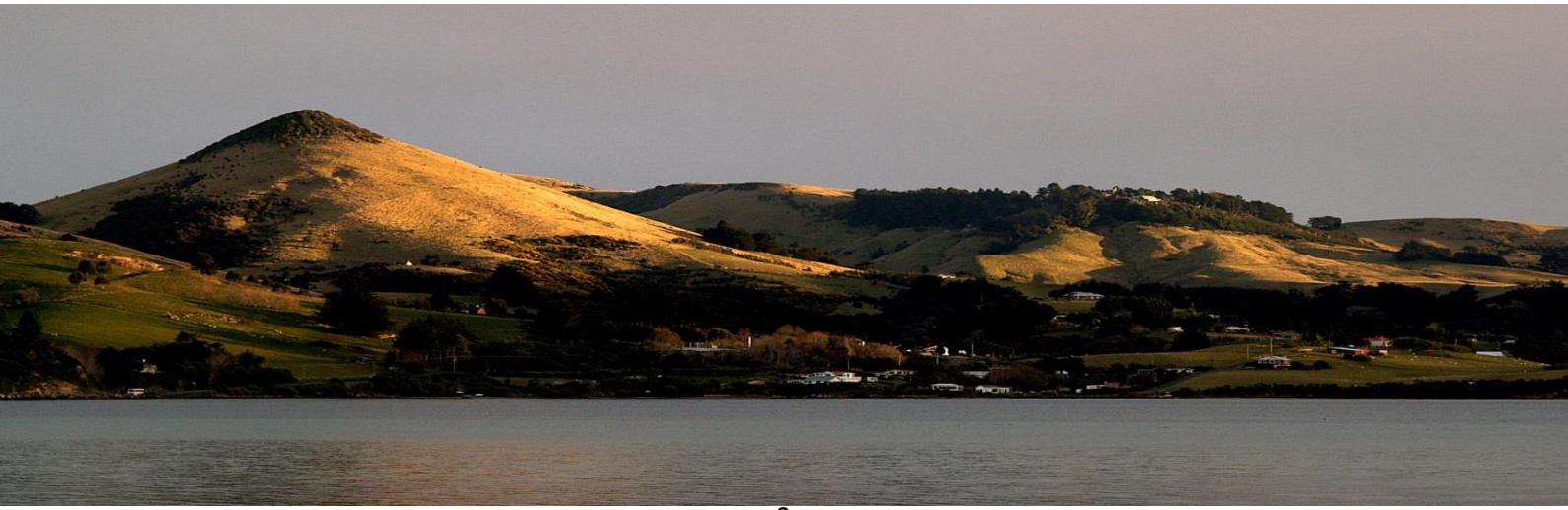
Operational Report
May 2010 - June 2013

Prepared by Richard Wilson, Project Manager, Otago Peninsula Biodiversity Trust
Position Funded by DOC Biodiversity and Condition Fund
July 2013

Funding Acknowledgements: *The Otago Peninsula Biodiversity Trust would like to acknowledge and thank the organisations that contributed funding towards Possum Control and Environmental Monitoring on the Otago Peninsula over the last 3 years-Department of Conservation- Biodiversity and Condition Fund, New Zealand Lottery Grants Board, Ministry for The Environment, Otago Community Trust, Department Of Conservation, Otago Conservancy, Speight's, The Southern Trust, The Dunedin City Council, The Lion Foundation, Foodstuffs, Otago Peninsula Trust, Otago Peninsula Community Board, Larnach Castle, PricewaterhouseCoopers, Taieri Wool and Skins Lyndon Taylor (Otago Regional Council support in kind mapping/ traps), Sam and Des Neil and Richard Farquhar.*



Contents Page

1. Preliminaries

1.1 Executive Summary: "The Otago Peninsula Biodiversity Trust is enhancing the Otago Peninsula's natural environment for people and our indigenous wildlife. Through partnerships that enable the community to participate in and deliver co-ordinated peninsula-wide pest control and biodiversity-enhancing projects we are restoring the resilience of ecosystems and providing a healthy quality of life for all."

Over the last three years to May 2013, the Trust has:

- Completed two years of possum control in Sectors 1-3 (4,196ha) with over 4,000 possums now removed. This represents an average reduction in possum numbers of 82% across the three areas;
- Completed the initial knockdown (1 year) of possums in Sector 4 (4,379 ha) with approximately 2,272 possums now removed ;
- Established 23 one-kilometre bird monitoring transects, each of which is walked by Volunteer Bird Monitors. The objective is to measure changes in bird numbers and species after possum control operations have been implemented;
- Established 14 vegetation monitoring sites with the help of a consultant ecologist. This involves using foliar browse index, permanent vegetation plots and photo points;
- Established 10 rodent monitoring lines through different habitats. The objective of rodent monitoring is to measure changes in rat numbers after possum control operations;
- Reached approximately 3,500 volunteer hours in 2010-12;
- Established the "Speight's Bait Station/ Trap Line" from September 2011 in Sector 3, to initially prevent re-invasion / movement of possums across sectors.
- Initiated community trapping by volunteers and contractors in urban areas using Timms Traps.
- Collaborated with Amy Adams (University of Otago), who has recently completed her PhD Thesis investigating the 'Spatial Movement of Possums in Urban Environments'.
- Continued successful fundraising, underpinning the project's momentum. As at March 2013, approximately $628,000 has been raised for the Pest-Free Peninsula project;
- Generated significant media coverage from the project, including coverage on mainstream television and in the print media.

1.2 Background: In 2008 the original members of the Otago Peninsula Biodiversity Group (OPBG) came together out of a shared desire to enhance and protect the natural values of the Otago Peninsula. There was a shared appreciation that the Peninsula is a unique place, and that its underlying values need protecting and enhancing.

Throughout 2008 and 2009 the group embarked on planning and consultation for their flagship project "Towards a Pest-Free Peninsula". During this 18-month period the group consulted widely with the community, and received widespread support for its stated ambition to control possums on the Peninsula. The group then commissioned the development of a technical Possum Eradication Plan. In 2010 the OPBG became a charitable trust. The Trust's first objective sums up the intent of the Trust − "To sustain the natural environment of the Otago Peninsula – a place of international significance for its wildlife, where natural and economic values are mutually reinforced and respected and where protection of biological diversity is in keeping with resilient ecosystems, production from the

land and a healthy quality of life." Also in 2010, the Trust contracted a project manager to implement a three-year operational plan centred on beginning the long-term process of removing possums from the Peninsula. The interim goal of the possum-free project is to achieve 0% density of possums across the Peninsula by 2015.

1.3 Project Objective: To enhance the biodiversity of the Otago Peninsula by implementing animal pest control operations (specifically possum control) using contractors for the initial knockdown of possum numbers across Sector 1-5. Contractors and community volunteers will monitor environmental effects through possum monitoring and survelliance techniques and bird/vegetation/rodent monitoring projects. At the end of the project possum numbers are to be at zero % density. The Possum Project is the first project in a long term programme to remove all pests from the Peninsula.

1.4 Target species: The target pest for this control programme is the Australian Brushtail Possum (*Trichosurus Vulpecula).*

1.5 Operational Site: The 9,500ha Otago Peninsula is a rugged finger of the eroded flank of the extinct Dunedin volcano, rising from sea level to 408m. The eastern seaboard is flanked by numerous coastal beaches and cliff faces with the Otago Harbour forming the boundary on the western side. It is dissected by a variety of gullies that discharge directly into the sea or into large estuaries.

Vegetation over the entire peninsula is predominately rough pasturage but there is huge variety of ecotypes including coastal sand dunes and cliffs, sand flats and estuaries, dense flax lands and coastal shrub, scrubland and forest fragments centred on gullies and farmland consisting of hedgerows, tree lanes, small pockets of scrub, gorse and broom, small pine plantations and numerous native bush remnant blocks. Approximately 1000ha of land consists of urban residential settlement with accompanying assorted garden and tree types.

Otago Peninsula with Dunedin City in Foreground

1.6 Operational Area: The operational area is the Otago Peninsula including all areas north of the boundary line of Shore St, Tainui Rd and Chisholm Park Golf Course in Dunedin extending to the northern tip of the peninsula at Taiaroa Head. The operational area consists of approximately 9500ha of which 8575ha is regarded as being rural land. The remainder of land can be considered urban/residential.

1.7 Operational Area Land Use: The land use in the operation is predominately rural farmland with rolling to steep topography from sea level to 410m. Most farming operations are sheep based. There are numerous significant wildlife reserves and ecotourism operations based on public land administered by DOC and private land. There are several public walking tracks that meander over the peninsula and an extensive cycleway is being developed. There are numerous lifestyle blocks. The buffer zone consists of dense residential housing. Over 200,000 people visit the Otago Peninsula annually.

1.8 Operational Plan: For Operational Planning purposes work was split into two stages- **Stage One**-Knockdown Operations and **Stage Two**-Mop-Up Operations.

Stage One Knockdown involved the splitting up of the Peninsula into 5 sectors for initial control work by contractors to the OPBG. The creation of a 400ha buffer known as the Clarks/ Sheppard's Hill buffer separates the peninsula into a series of "island" sectors and creates the opportunity to work in a sector by sector (island) approach. Sectors 1-3 received the initial work with the buffer at Clarks / Sheppard's Hill (Sector 3) acting as protection for Sectors 1 and 2. This buffer will continue to be maintained with permanent bait stations, bait bags, trapping effort and night shooting operations to protect the integrity of work already implemented in those 3 sectors. Knockdown work has occurred from 2011-13.

Stage Two Mop-Up involves more intensive work in areas of prime possum habitat that has been identified from the knockdown control operations. Using a variety of methods "hot" habitat areas are concentrated on with intensive bait station and trap work, it also includes methods such as spotlighting, shooting and tracking/ indicator dogs. Intensive mapping of all gps points for traps, bait stations, spot poisoning, possum kills, and non-target kills is being done as part of the planning before mop-up operations begin. Further liaison with the Island Eradication Advisory Group will also occur at this time. The time of year and weather conditions will be an important factor as intensive ground searches using bait stations, bait bags, wax tags, chew tags, targeted poisoning, night shooting and indicator dogs begins.

1.9 Operational Sectors: The operational area was divided into 5 sectors. *See aerial photo this page.*

Table 1

Sector	Name	Hectares
1	Cape Saunders	1569
2	Taiaroa Heads	2230
3	Clarks/ Sheppard's Hill	397
4	Peninsula South	4379
5	Urban Buffer	869

Map 1.Otago Peninsula divided into 5 Sectors (Aerial Photograph)

1.10 Operational Zones: Within the 5 sectors there were different "operational zones" which were identified as requiring different approaches to the control work due to their different attributes and risk assessment. These were –

a) ***Urban Areas and areas within 100m of urban areas and housing***- The primary constraints on control activities in this 869ha zone were 1) safety of residents, 2) community/ neighbour consents and 3) domestic pet safety. Within this zone the landowner occupier has/had the choice on which technique is implemented within their property. The notable suburbs and areas of small settlements that occur within this zone are-

- Harrington Point, Otakou, Harwood, Gills Corner, Portobello, Edwards Bay
- Turnbulls Bay, Broad Bay, Raynbirds Bay, Company Bay, Macandrew Bay
- Glenfalloch, Challis, The Cove, Pukehiki, Highcliff

Acceptable Possum Control methods were restricted to the following low risk methods- Timms traps, Live Capture Cages.

b) ***Publicly accessible lands***- Principal constraints for possum control in these areas were 1) safety of visitors and 2) community / neighbour consent. The closure of access to some areas of publicly accessible lands was considered but was thought not to be necessary. The following walkways and tracks accessible to the public on the Otago Peninsula are –

- Bacon Track up to Highcliff Rd (access off Bacon St, Broad Bay)
- Braidwood Road Track (access off Braidwood Rd)
- Buskin Road Track to Boulder Beach (access off Highcliff Rd)
- Camp Road Track (access off Portobello Rd, Broad Bay)
- District Road Track up to Highcliff Rd (access off Portobello Rd)
- Greenacres Track up to Pukehiki (access of Greenacres St, Macandrew Bay)
- Harbour Cone Track (access of Highcliff Rd)
- Highcliff Track (access off McMeeking Track, off Karetai Rd, Highcliff)
- Karetai Road (Smails Beach, Ocean Grove)
- McTaggert Street Track (access off Portobello Rd, Company Bay)
- Nyhpon Track to Hooper's Inlet (access off Highcliff Rd)
- Paradise Road Track down to Boulder Beach (access off Highcliff Rd)
- Quion Cliff (access off Pipikaretu Rd)
- Ridge Road Track to Sandfly Bay (access off Sandymount Rd)
- Sandfly Bay
- Soldiers Monument from Ocean Grove (access from reserve area Oregon St)
- Soldiers Monument from Highcliff Road
- The Chasm/ Lovers Leap and Summit Cairn (access off Sandymount Rd)
- Turnbulls Bay
- Okia Reserve (access off Dick Road)

Acceptable Possum Control methods were Timms traps, Leg hold, with Feratox bait bags/bait stations kept a minimum of 20m off all tracks.

c) ***Private rural land***- The principal restraints to eradication activities are 1) agreement for access, 2) stock safety and management and 3) land-owner expectations.

Acceptable Possum Control methods were Feratox Bait Bags/ Bait Stations kept a minimum of 20m off all tracks and roads, Leg Hold Traps, Timms Kill Traps, Live Capture Cages, Shooting and Indicator Dogs..

d) ***Buffer Zone***- This is the urban area acting as a buffer against future reinvasion. Properties in this urban area have a high cover of gardens and trees which may act as reservoirs for possums or as pathways for possum invasion. The primary restraints on control activities in this zone are the same as for the urban zone, 1) safety of residents, 2) community expectations and 3) domestic pet safety. The suburbs that are in the buffer zone are the following- Waverly, Shiel Hill, Andersons Bay, Musselburgh Rise, Tainui, Ocean Grove

Acceptable methods will be Timms traps, Live Capture Cages and Warrior/ Sentinel Kill traps (sited above child height). Some use of toxins (feracol bait bags) may be suitable. Please note work is to commence in Sector 5 (Urban Buffer) in Spring of 2013.

e) ***Physically inaccessible areas***- The very steep nature of the terrain in this zone restricts control techniques. Areas identified that fall within this zone are the following (from Taiaroa Heads south)-

- Taiaroa Heads to Rerewahine Point-
- Cliff face above Penguin Beach
- North end of Ryan's Beach to Quion Cliff
- Cliff face north of Victory Beach to Te Whakarekaiwi
- Eastern cliff face from Titikoraki to Ohinepuha
- Otewhata south to Cape Saunders
- Cape Saunders south to Matakitaki Point and headland near Wharekakahu Beach
- Harakeke Point to The Chasm
- Seal Point to Sandfly Bay
- Boulder Beach south to Highcliff
- Highcliff south to Maori Head

Methods used to date have been bait bags attached to whiteboards (used as an attraction) along the top of cliff edges and bait stations.

1.11 Acceptable Methods for Possum Control Operations on the Otago Peninsula (As per Community Consultation)

Traps

- Leg hold traps (Victors, Dukes, Sleepy Creeks, other brands of No 1 leg holds)
- Leg hold traps (Victors 1.5 soft jaw)
- Timms Kill Traps/ Sentinel or Warrior Kill traps
- Live Capture Cages

Leg Hold Trap

Timms Trap

Live Capture Cage Trap

Poisons

- Feratox (encapsulated cyanide pellet in bait bags, bait stations, or strikers)
- Cholecalciferol (Bait Stations-gel)/ Talon/ Pest Off (Brodifacoum) Bait Stations

Feratox Pellets

Bait Bag

Striker

Dogs

- Possum indicator dogs/ Day and night work/ Spotlighting

Shooting

- Spotlighting/ Shotguns/ .22 Rifle

Wax Tags/ Chew tags (Monitoring Method)

- Bite marks on tags which indicate presence/ absence of different pests based on teeth impressions

1.12 Operational Timing: The timing of Possum Control Operations on the Otago Peninsula was as follows-

Consultation Process

2008- Present	Initial Process/ Public Meetings on-going to present
September 2010	Farmers and major landholders in Sectors 1, 2, 3
Sept- October 2010	Harrington Point, Otakou, Harwood Residents Sector 2
Sept- October 2010	Initial meetings with legislative bodies regarding consents

Tenders

September 2010	Registrations of Expressions of Interest from Pest Control Contractors
October 2010	Pre-qualification documents and weighted attributes
October 2010	Tender Schedule for Initial Knockdown Control Operations
November 2010	Tender Close off
December 2010	Successful Tendering Contractors Notified

Landholder Meetings (Sectors 1-3)

January 2011	Landholder Meeting with Contractors prior to operations

Knockdown Control Operation (Sectors 1-3)

Feb 2011	Sector Knockdown Possum Control Operations begin
April-May 2011	Sector Knockdown Control Operations end

Monitoring Operation

May-June 2011	Monitoring Operation (Sectors 1-3)

Review

June-July 2011	Review of all current operational data (mapping, gps points of poison baits, bait stations, bags, traps, possum kill locations and non-targets, hunter kill returns, habitat).

Buffer Maintenance Operation (Sector 3)

June 2011 onwards	Bait Stations and Timms Traps sited in buffer at Clarks / Sheppard's Hill. Allan's Beach Rd Bait Station Line (Speight's Line) established and maintained. Continual bait station and trap checking.

Break in Operations

Aug- Oct 2011	Break for lambing Sectors 1, 2, 3, 140 Timms Traps out to volunteer trappers in Peninsula Suburbs

Mop- Up Operations (Sectors 1, 2, 3)

March- June 2012	Intensive mop-up operations over the 3 sectors carried out by contractors- Otago Pest Services Ltd, DM Holdings Ltd and Bruce Kyle

Break in Operations (Sectors 1, 2, 3)

August- Sept 2012 — Break to allow accumulation of sign of remaining possums (also lambing period)

Community Trapping Project

August- Oct 2012 — Community Trapping Project through urban suburbs of the Peninsula using contractors- DM Holdings Ltd

Landholder Meetings (Sector 4)

October 2012- — Landholder Meeting with Contractors prior to operations

Knockdown Control Operation (Sector 4)

Dec 2012- July 2013 — Initial Possum Control Operations in Sector 4 using contractors- DM Holdings Ltd, Bruce Kyle and Regional Services

Review of Operations to date (All Sectors)

July 2013 onwards — Review of all current information to date

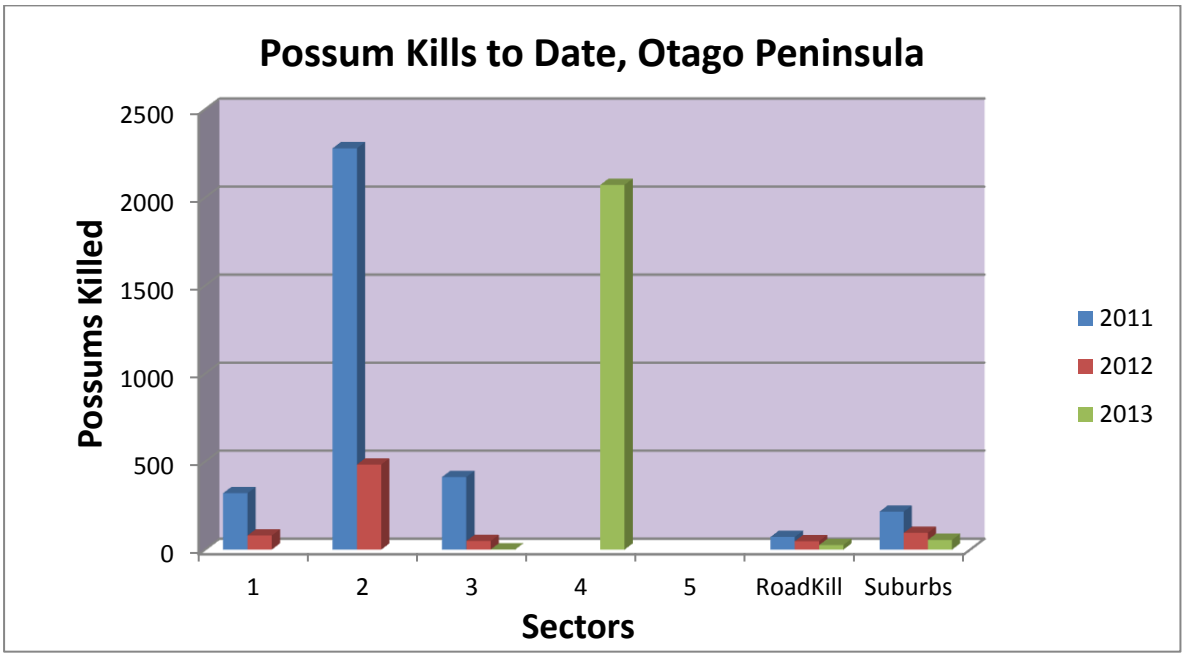
1.13 Legal Consents Required: Numerous consents were required from public authorities prior to possum control operations being implemented. Permission from landowners was also required. These are listed below-

- Application for a Permission for the use of Vertebrate Toxic agent(s) from Medical Officer Of Health (Public Health South, Main Block, Level 2, Wakari Hospital, Taieri Rd, Wakari, Dunedin).
- Assessment of Environmental Effects, Department of Conservation, Biodiversity Threats, Otago Conservancy, Stuart Street, Dunedin
- Landowner Access Forms
- Advertising in Newspaper
- Poison Warning Signs/ Trapping Signs

Poison Warning Sign

2.2 Summary of Possum Kills (All Sectors) March 2011 through to May 2013

Graph 1



2.3 Reduction % in Overall Possums killed in 2 year period (2011-2013)

Table 2

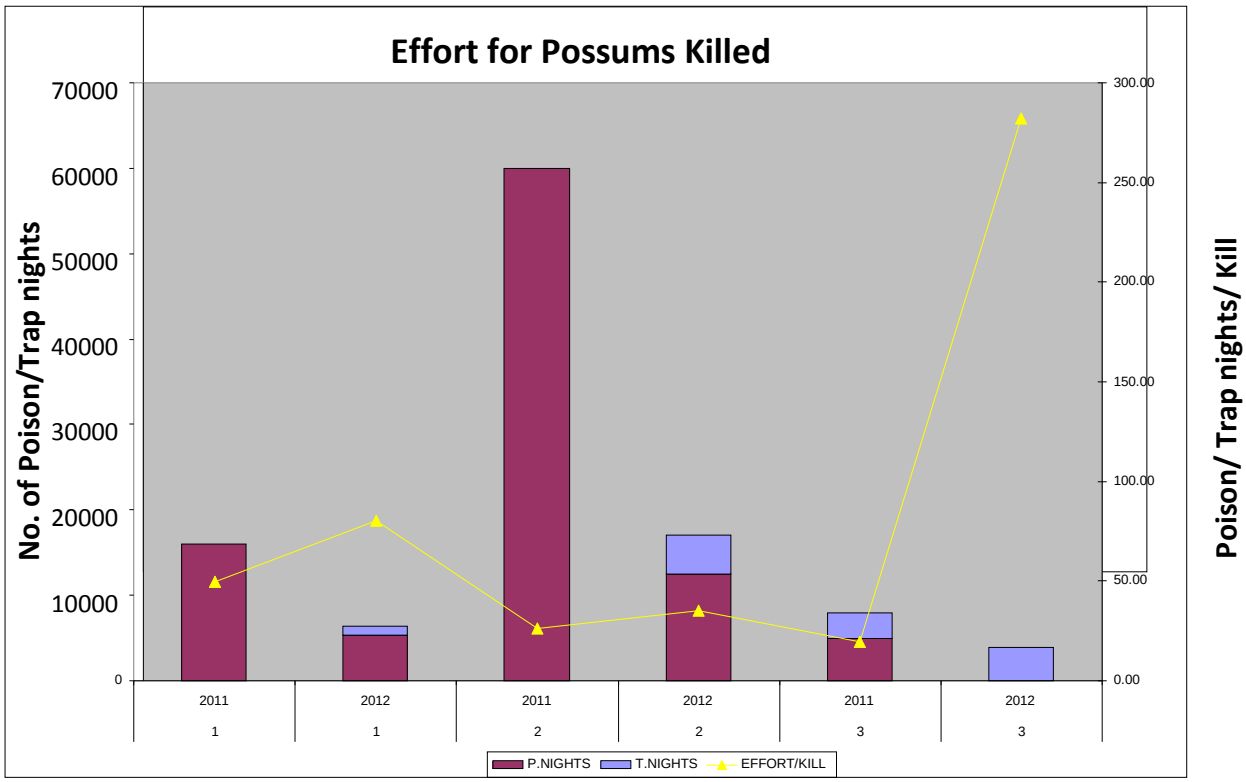
Sector	No. of Years Worked	% Reduction
1-Cape Saunders	2	75%
2-Taiaroa Head	2	79%
3-Clarks/Sheppard's Hill Buffer	3	98%
4-Peninsula South	1	1 year work only
5-Urban Buffer	0	No work done

2.4 Effort Expended for Possums Killed 2011-2013 (Contractors only)

Table 3.

Sector	Man Days	Possums Killed
1-Cape Saunders	96	404
2-Taiaroa Head	224	2,794
3-Clarks/ Sheppard's Hill Buffer	83	466
4-Peninsula South	151	2,072
5-Urban Buffer	0	0
Total	**554**	**5712**

Graph 2



Graph 2 above illustrates the amount of effort that has been required to kill possums across all 3 sectors over the last 2 years. Along the bottom line (x axis) are the sectors and years worked. The left hand vertical axis refers to the number of poison and trap nights expended on the job in each sector. The right hand axis refers to the number of poison and trap nights per kill.

For example Sector 2 in 2011 had 60,000 poison and trap nights expended with one possum killed for every 21 poison/trap nights. In 2012 Sector 2 had 17,000 poison and trap nights expended, with one possum killed for every 35 poison/ trap nights.

The standout is Buffer 3 in 2012 (at time of graph produced) had 3950 trap nights with 282 trap nights expended for every possum killed. This illustrates the huge effort required to get low numbers of possums in “cleaned out” habitat.

Dead possums and Ferafeed Bait Station (Feratox)

2.10 Sectors 1, 2 and 3 Knockdown Summary (2011): Possum Control Operations in Sectors 1, 2 and 3 (4,199 ha) were tendered out to 16 Otago Based Animal Health Board registered contractors. The successful contractors were Otago Pest Services Ltd (Jim Hughes) and DM Holdings Ltd (Dave McPhee). Medical Officer of Health approval for the use of Pesticides was granted as was permission from all landholders and Local Territorial Authorities (LTAs) prior to work commencing. Public notification was given via newspaper, press releases and email. Warning notices were placed at all access points to the operational areas and the Medical Officer of Health (Public Health South) audited the operation to ensure compliance with conditions of use. All sectors were monitored using the Residual trap catch index and met the target RTC of 1%.

The following information is a summary of the operation-

Operation Start date: **1st March 2011**: Operation Finish date: **29th May 2011**

Table 4

Sector	Hectares	Labour days	Poison Baits	Possum Kills
1- Cape Saunders	1539	48	3200	321
2- Taiaroa Head	2230	126	12000	2080
3- Clarks/ Sh. Hill	400	33	1000	350
Totals	**4169**	**207**	**16,200**	**2751**

Control Methods: Feratox Bait Bags, Feratox Bait stations (orange KK Bait Stations) prefeed then loaded with feratox pellets in feed paste, Timms Kill Traps, Leg Hold Traps, limited night shooting and indicator dogs.

Approximately **16,200 poison baits** covered habitat in the operational sectors and over **2751 possums** were killed by contractors in this initial knockdown. All bait bags, baits stations and trap locations were gps'd and records of all animals killed were logged and all toxin was recovered off "the hill". As far as possible all possum carcasses were recovered.

OPSL Contractors about to skin possums after a day's work

Non- target Animals Killed: Feratox poison baits are very target specific and no non target animal deaths occurred from this method. Over the course of night shooting operations and possum monitoring using leg hold traps the following 'non-target' animal deaths have been recorded- 15 feral cats, 32 rats, 12 hedgehogs, 11 rabbits.

Audits: Field audits were conducted involving best practise for traps, poison and firearms. A Health and Safety Audit was also conducted as were periodic audits of poison warning signage placed on all access points to the operational areas. The Project Manager was regularly in the field and both formal and informal meetings were held with contractors and landowners to ensure that operational plans were being followed. At the completion of the operation, monitoring reports and individual reports (including maps of gps positions of trap/ bait sites and possum kills) were written and distributed to all landholders subject to operations.

Possum Monitoring Results: Possum Monitoring was implemented according to the NPCA Protocol (National Possum Control Agencies). Each Monitor Line consisted of 10 traps spaced 20m apart over a 200m line. Trap lines were selected randomly across all habitat types.

Table 5

Sector	Hectares	Monitor Lines	Possums	RTC
1- Cape Saunders	1539	16	3	0.7%
2- Taiaroa Head	2230	22	6	0.9%
3- Clarks/Sheppard's. Hill	400	6	1	0.6%
Totals	**4169**	**44**	**10**	

Possum Monitoring- checking the lure size and ensuring trapset is correct.

2.11 Sectors 1, 2 and 3 Mop-Up Summary (2012): The following information is a summary of the Mop- Up Operations implemented in 2012-

Operation Start date: **1st March 2012:** Operation Finish date: **30TH June 2012**

Table 6

Sector	Hectares	Labour days	Poison Baits	Possum Kills
1- Cape Saunders	1539	48	6341	80
2- Taiaroa Head	2230	98	12,000	484
3- Clarks/ Sheppard's. Hill	400	45	0*	51
Totals	**4169**	**191**	**18,341**	**615**

** Only traps used*

Control Methods: Feratox Bait Bags, Feratox Bait Stations (orange KK Bait Stations) prefeed then loaded with Feratox pellets in feed paste, Timms Kill Traps, Leg Hold Traps, limited night shooting and indicator dogs. Approximately **18,341 poison baits** covered habitat in the operational sectors and over **615 possums** were killed by contractors during mop-up.
Non- target Animals Killed: Feratox poison baits are very target specific and no non target deaths were recorded.

2.12 An example of information gathered from Mop-Up Operations

In Sector 2 (Taiaroa Head) there were 3 main strata (habitat areas) identified. Taiaroa Bush consists of 56 hectares of mixed native bush, grazed and un-grazed, Okia Reserve is 200 odd hectares of sand dune, grasses , bracken fern, flax and pine trees and the remaining farmland consisted of grazed pasture mixed with tree lanes, small native bush remnants, pine plantations. Essentially they formed 3 distinct habitat strata.

Graph 3

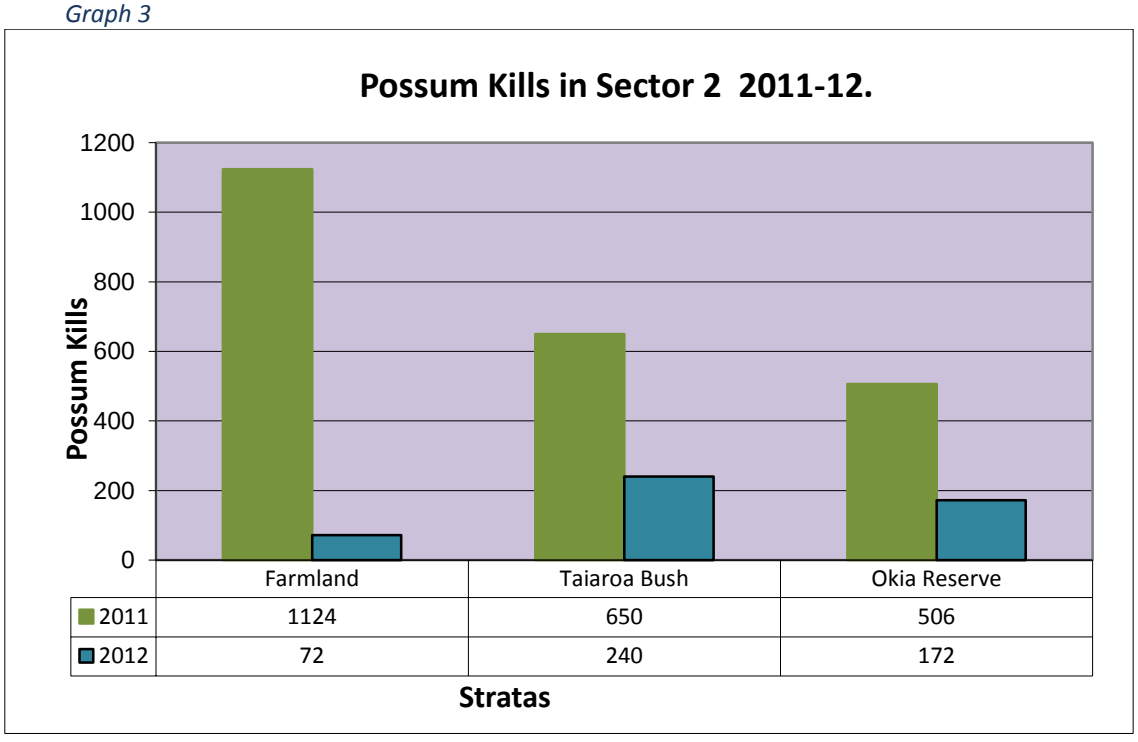


Table 7

Strata	% Reduction from 2011 to 2012
Farmland	94%
Taiaroa Bush	65%
Okia Reserve	66%

Discussion Points: In the first year of mop-up work Numbers of possums caught were still alarmingly high in some areas, most notably in "typical" possum habitat at Okia Reserve and Taiaroa Bush. However across the rest of what would be termed "typical farmland" numbers of possums caught in year 2 were much lower. From the previous page several conclusions can be drawn-

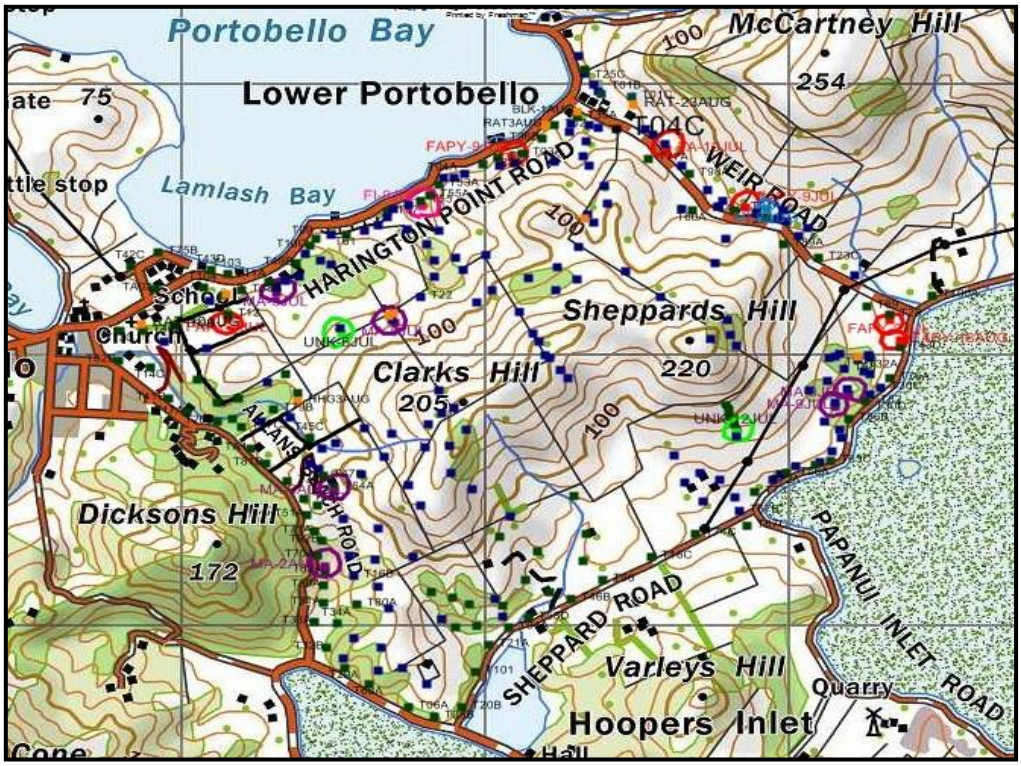
1) There was still high numbers of possums in these areas post year 1 knockdown despite the good monitoring result from 2011.
2) Prior to OPBG control work starting possum numbers were high right throughout Sector 2. The favourable habitat that makes up Taiaroa Bush and Okia Reserve was quite simply "full" of possums. Possums were spilling over into the surrounding farmland from these favoured areas in an attempt to find "living space" and to set up viable territories. Large numbers of possums were killed in the first year of control across Sector 2. We can theorise that remaining possums from this initial knockdown were looking for food, shelter and sex. Okia Reserve and Taiaroa Bush are the prime habitats offering these opportunities to remaining possums. Possums left in less favoured habitat in farmland areas may have also found their way back to Taiaroa Bush and Okia Reserve over the last 16 months and managed to establish new territories there in the absence of those possums killed in the initial knockdown. This has led to a great reduction in possum numbers killed across farmland habitat (despite similar control efforts to year 1) but a smaller reduction in numbers Taiaroa Bush and Okia Reserve.

2.13 Sector 3 Mop- Up and Maintenance Project (Clarks Sheppard's Hill Buffer): The work in the buffer was undertaken with a view to clearing Sector 3 to the lowest achievable level in the time available. It was also undertaken to help isolate Sectors 1 and 2 from the as yet to be controlled Sector 4. Sector 3 is critical in that its geographic location helps create a series of "islands" on the Peninsula.
For the maintenance programme it was decided that only Timms kill traps would be used as the area had been heavily poisoned with Feratox prior to this work and we did not want bait shyness to become an issue. Timms traps proved very effective, being highly visible to possums and a method that possums had not encountered before. Traps were baited with a quarter of apple, and peppermint/ flour/icing sugar lure was applied to trees or posts directly behind each trap. Traps were moved regularly to sample all possum habitat and corridors. An indicator dog was used in some dense habitat adjacent to roadsides.

Operational success was measured by recording accumulated kills, trap nights and kills per trap night Capture locations are shown in Figure 1 (next page). It is worth noting that no possums were caught above the 100m contour, and ~80% were caught within 100m or so of roads surrounding the block. This suggests that previous poisoning and trapping had been very effective, and that possums caught during this operation were likely to have moved into Sector 3 either across or along the road corridors. It was also evident however, that

much of the most desirable habitat in this block is located close to the roads in the form of hedges, scrub, gorse, native bush, banana passion fruit and shelter belts.
For these reasons, a ring of Timms traps has been left in place around the roadside perimeter to (a) protect the outcome that has been achieved and (b) to provide on-going possum control and further monitoring of possum abundance, movement and distribution. It is suggested that a smaller number of 'sentinel' traps and wax tags should also be left 100m inside the outer ring to provide additional protection and trap catch data. It was obvious that the Sector 4 block adjacent to Sector 3 receive concerted possum control as soon as possible if Sector 3 was to remain 'clean'. Sector 4 received possum control from December 2012.
The map below is used as an example to illustrate the intensive work and behind the scenes planning that went into the buffer maintenance work. It shows current trap sets (green points), previous trap sets (blue points), non-target catches (orange points) and possum catches (circled points).

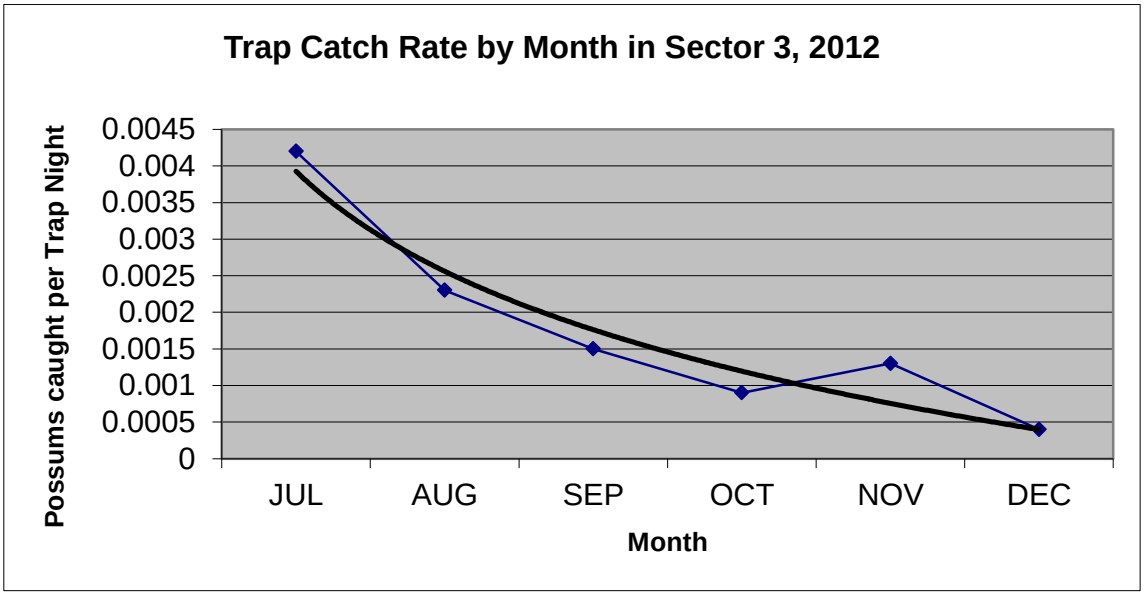
Map 2



Sector 3 Buffer (Clarks/ Sheppard's Hill) Topographical Map with traps sites

2.14 Trap Catch by Month in Sector 3:

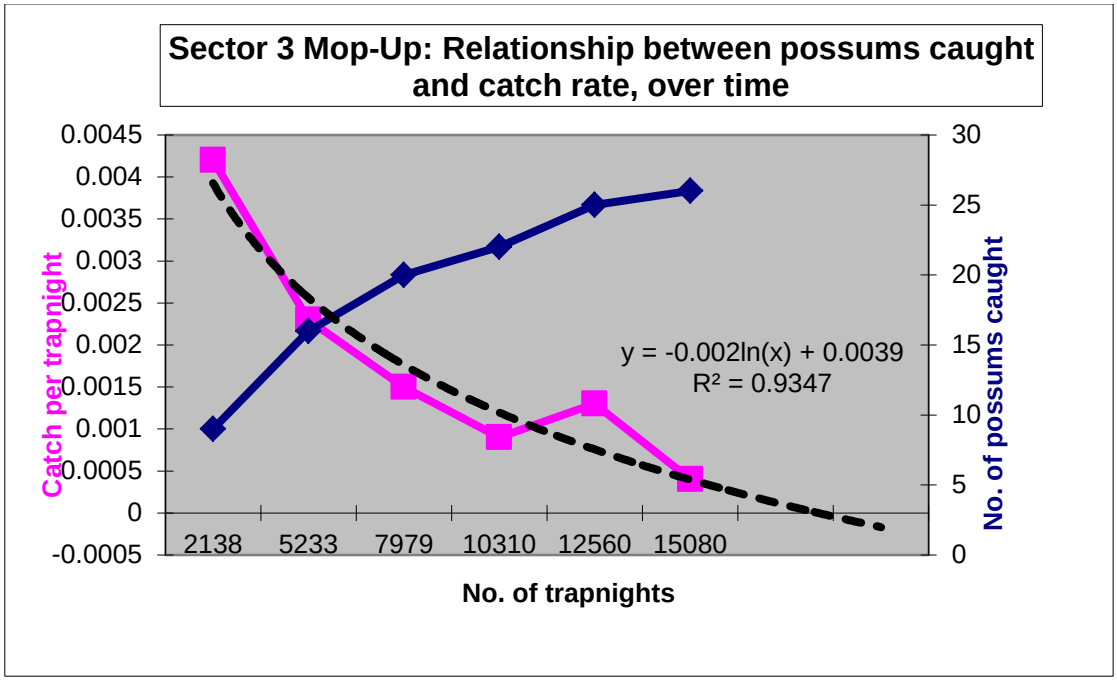
Graph 4



Trap catch in this buffer is now 0.0005 %, i.e. one possum caught per 2000 trap nights; initial trap catch was 35%. It is possible that this trend can be further reduced towards zero kills/trap night if perimeter and sentinel traps are left in place while adjoining areas are treated.

2.15 Relationship between possums caught and catch rate over time:

Graph 5



The blue line indicates that a total of 26 possums were trapped inside the buffer zone over 15080 trap nights, or six months. The pink line shows the decline in catch rate (catch per trap night) over that time. The last possums to be caught clearly and inevitably require more trapping effort than those before them. The black dotted line is a line of 'best fit', or model that approximates or predicts the rate of possum removal (see equation). A catch rate of 0% is predicted after another month's work.
The R-squared value (0.9347) indicates that the line of best fit is a very accurate one, as it is close to 1.0000 (perfect correlation). It is evident that the work undertaken in the Buffer Zone has been extremely successful at reducing possums to near zero.

2.16 Sector 4 Knockdown Summary 2012-13: For the purposes of the Possum Knockdown Operation Sector 4 was divided into 3 strata- Urban Areas (approximately 500 ha), Farmland (3,203 ha) and DOC Estate (676 ha). Within the sector these 3 very different strata required different approaches to the knockdown control work due to their different land use and habitat.

Urban Areas- Urban Areas consisted of all suburbs within Sector 4 of the Otago Peninsula with a buffer of 150m around the urban housing/ farmland boundary. The primary restraints on possum control activities in this 500ha zone were 1) safety of residents, 2) community expectations and 3) domestic pet safety. Within this zone the landowner occupier had the choice of two low risk techniques implemented on their property- Timms Traps or Live Capture Cages. The notable urban areas /suburbs in Sector 4 were the following-

- Portobello, Edwards Bay, Turnbulls Bay, Broad Bay, Raynbirds Bay, Company Bay, MacAndrew Bay, Glenfalloch, Challis, The Cove, Pukehiki

Work implemented in these suburbs was known as "The Community Trapping Project" and "Community Kills" (by residents themselves).

Farmland- consisted of all rural farmland within Sector 4 of the Otago Peninsula (approximately 3,203 ha). The principal restraints to possum control operations on private farmland within Sector 4 were 1) agreement for access, 2) stock safety/ management and 3) land-owner expectations. The full suite of acceptable methods was available for use subject to the farmer's agreement. Methods consisted of the following-*Traps*- Leg hold traps, Timms Traps and Live Capture Cages, *Poison*- Feratox (encapsulated cyanide in bait bags and bait stations), *Wax Tags*- Bite marks to indicate presence/ absence.

DOC Estate- DOC estate in Sector 4 of the Otago Peninsula consisted of 676 hectares made up of the following reserves- (Sandymount Recreation Reserve [192.8 ha], Sandymount Wildlife Refuge [31.7 ha], Sandfly Bay Wildlife Refuge [338.3 ha], Boulder Beach Conservation Area [74 ha] and WWF Block [39.6 ha]). Principal restraints for possum control in DOC estate were 1) safety of visitors, 2) community expectations and 3) the presence of Yellow Eyed Penguins. The Reserves were not closed for the possum control operations. Two methods were employed- Bait Stations loaded with prefeed cereal pellets and feratox and Bait Bags.

Contract Personnel: D M Holdings Ltd (Dave McPhee), Bruce Kyle (private contractor ex DOC) and Blair Barringer from the Otago Regional Councils- Regional Pest Services.
The contractors were engaged to provide initial (knockdown) possum control, for Sector 4- Peninsula South. The aim of the knockdown phase was to conduct a 'complete coverage' possum operation in order to remove as many possums as possible in the allocated timeframe across all potential habitats, meaning every possible piece of possum habitat had some form of pest control applied. Some areas with high toxin uptake (by rats as well as possums) had more toxin added. All uneaten bait was removed at the completion of the contract.

Project Mgr. Rik Wilson with Victor Da Costa (Volunteer) and DM Holdings Ltd (Anton, Seth & Dave)

Control methods/ Signage: Two control methods were used to complete this operation- Feratox Bait Bags and Timms traps. Warning signs were erected at all access points (gates/entranceways) to the contract block where poison or traps were being used. Over 200 warning signs were present in the operational area.

Landholder relations: All landholders granted access to their land for this contract bar one. The OPBT is still working with this landholder to negotiate access to his property for future mop-up work. This landowner has on-going possum control occurring on his property by a private individual. This individual is trapping for fur.

Relations with landholders is one the most important aspects of the project. Contractor Bruce Kyle and Jimmy with landholder Bob Morris on the farmland above Sandfly Bay.

2.17 Overall Results Sector 4- Peninsula South:

Table 8

Sector	Hectares	Labour days	Poison Baits	Trap Nights	Possum Kills
4	4,379	273	12,500	5,260	2,029

2.18 Results by location in Sector 4- Peninsula South:

Table 9

Location	Hectares	Labour Days	Trap nights / Poison Baits	Possum Kills
Urban Areas	500	76	5,260 T/N	343
Farmland	3,203	137	3,000 PBs	1,154
DOC Estate	676	60	9,500 PBs	575

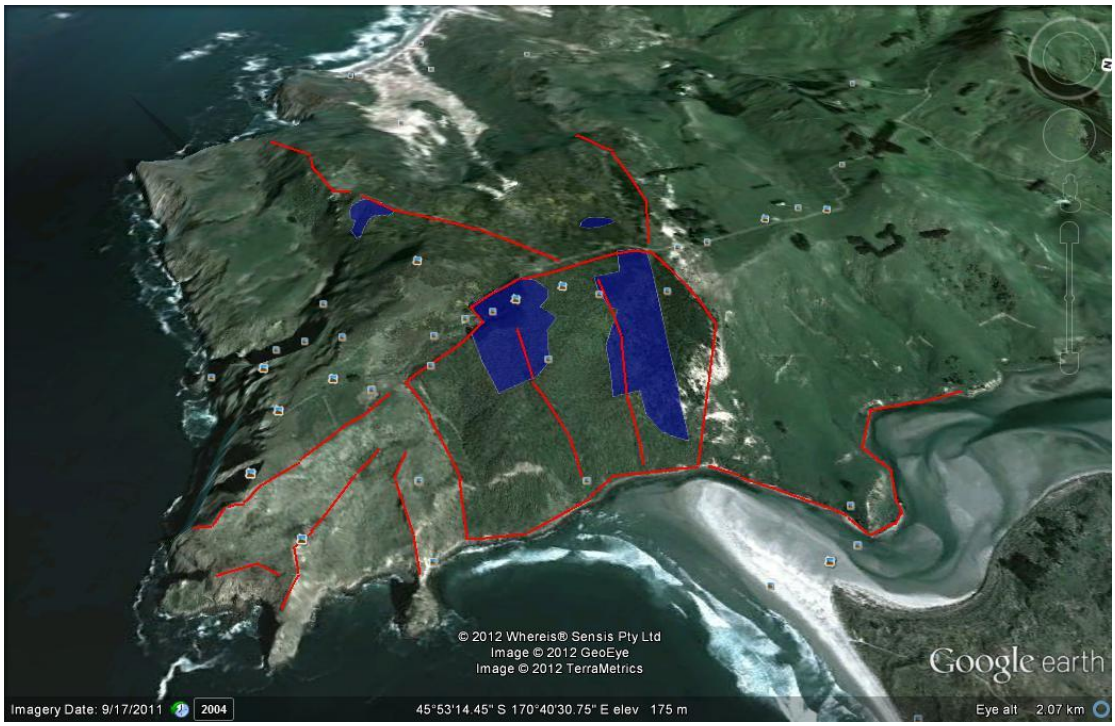
**Note Urban areas statistic comprises the Community Trapping Project, Community Kills and Road Kills from table below. Farmland comprises Farmland and Monitoring Kills from the table below and DOC Estate comprises Sandymount, Sandfly Bay and Boulder Beach statistics.*

Locations broken down Sector 4- Peninsula South

Table 10

Urban Areas	Method	Possums Killed
Community Trapping Project (Urban)	Timms Kill Traps	164
Community Kills (Urban)	Timms Kill Traps	152
Road Kills (Portobello Rd)	Cars/ Trucks/ Buses	14
Road Kills (Highcliff Rd)	Cars/ Trucks/ Buses	13
		343
Farmland	**Method**	**Possums Killed**
Farmland/ Lifestyle Blocks	Feratox /Timms Traps	990
Monitoring Kills	Leghold Traps	164
		1,154
DOC Estate	**Method**	**Possums Killed**
Sandymount/ Sandfly Bay Bait Station Line	Bait Stations	228
Sandymount/ Sandfly Bay Reserve	Feratox Bags	221
Boulder Beach/ WWF Reserve	Feratox Bags	126
		575
Total		**Possums Killed**
		2,072

2.19 Work in Sandymount Reserve:



Map 3. Aerial photo/map of Sandymount and Sandfly Bay Reserves with planned bait station lines (in red). Blue areas marked have received control work before in the form of Cyanide paste and Leg hold traps.

Retrieving possums off Sandymount/ Sandfly Bay Bait Station Line, contractor Bruce Kyle and volunteer Jimmy.

Bob Morris with possum haul *2 for the price of 1 (Female with joey)*

2.20 Community Trapping Project Summary (Sector 4 Urban Areas): The aim of the community trapping project was to conduct possum control operations in order to remove as many possums from the zone between suburbs and rural land and in other favourable habitats within the suburban community.

Contract Personnel: D M Holdings was contracted to implement possum control in Sector 4 in the communities of Portobello, Broad Bay, Company Bay, MacAndrew Bay, Challis Point and The Cove. This work was carried out over the period September and October 2012. The basis of the timing of the work was to have contractors working through the Peninsula suburbs prior to engaging in work on rural land after the lambing/ tailing period had finished. In that way the potential for possum movement back and forth across these two distinct land uses would be limited. The contractors got alongside members of the public in an effort to target potential possum habitat in people's back yards, whilst at the same time educating them about the wider goals of the Project and the efforts that people can do to protect their own little piece of 'Peninsula Paradise'

Control Methods: Three methods were used to complete this operation-
Timms Traps (Kill Traps), Live Capture Cages and Wax Tags (presence/absence indicators).
Timms Traps were baited with one third of an apple as per standards and a new long life bait (chocolate liquorice paste) was trialled as a substitute for apple which worked well in most conditions. It was noted however that in sunny spots inside the Timms Traps the paste was melting and rolling down the trap spindle. Live Capture Cages were used in areas where landholders had concerns about Timms Traps and the effect on pets like cats.

Results

Table 11

Labour Days	Trap Locations	Trap Nights	Possums Caught	RTC %
76	320	5760	164	2.84

Results by Suburbs

Table 12

Location	Possums Caught
Portobello to Broad Bay	70
Broad Bay to Company Bay	36
Company Bay to Challis Point	47
Challis Point to The Cove	11
Total	**164**

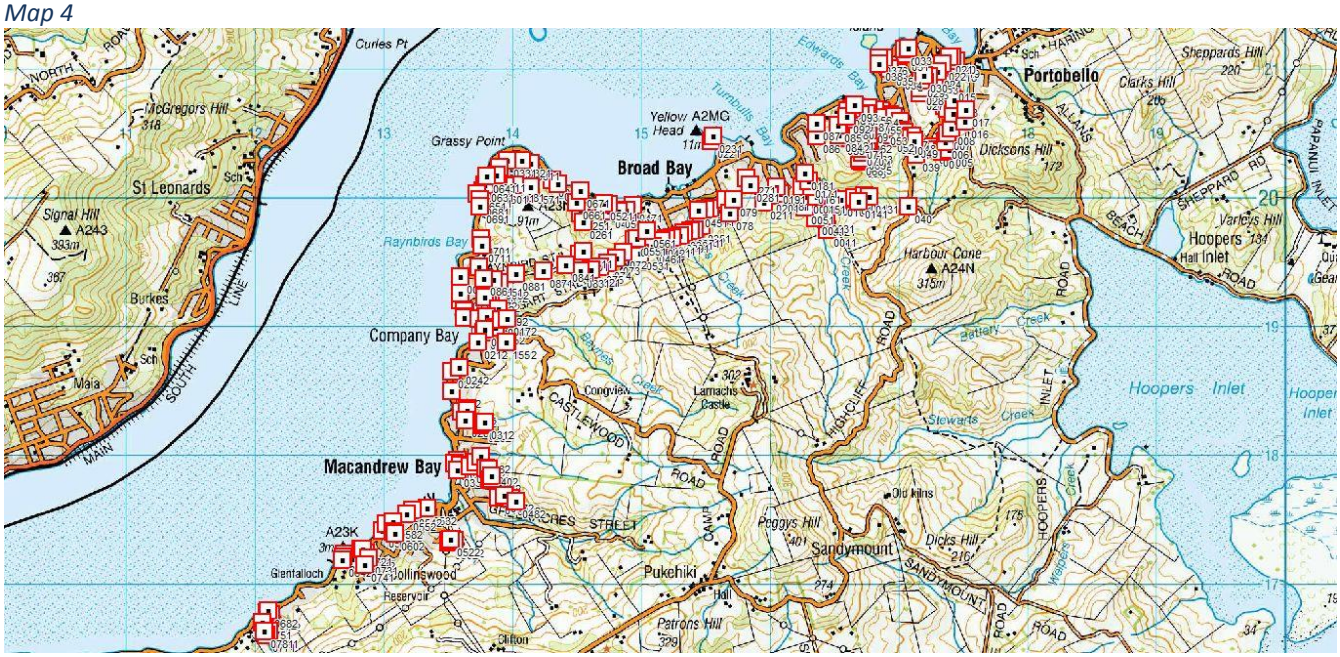
Non target animals: 6 Hedgehogs and 14 rats were killed in the Timms Traps and are recorded as non-targets.

General Comments: Each contractor carried a GPS unit to record where all Traps/ Wax Tags/ Cages were located and all possums killed had GPS locations saved. D M holdings staff

also carried cell phones with in-built cameras to capture any items of interest during this contract.

It was pleasing to note the number of landholders conducting their own possum trapping with most keeping accurate records of possum numbers over the years. Possum numbers were evenly spread across habitat within the Peninsula Suburbs with no real 'hot spots' discovered. Rats were a significant concern to residents however non-target rat deaths were relatively low. Approximately 180 traps have been left in situ in the suburbs for reactivation when more work is able to be done. These traps will reinforce areas of work on farmland adjacent to the communities.

Map 4



Community Trapping Project: Map illustrating trap locations in people's backyards from Portobello to Macandrew Bay.

2.21. Sector 5 Summary (Urban Buffer): No formal work has been implemented in this sector as yet. However contact has and is continuing to be made with local residents in an informal basis to garner support. Some residents have been trapping possums previously and others have had traps loaned out to them. Funding is presently being sought for this work to begin in late 2013.

2.22 Volunteer Base: We currently have 73 volunteers made up of 11 trustees, 36 bird monitors plus 1 data entry person, 10 vegetation monitors and 6 urban possum control co-ordinators, 2 part time field workers and 16 other people who have registered their interest. This does not include people voluntarily trapping in their suburban backyards. Over 5,500 volunteer hours have been contributed to the project in the last 3 years.

Volunteer Rory Kyle with a female possum caught in a leg hold trap.

Rory plucking the same possum for fur and checking for pouch young.

You are never too young to learn. Volunteer Scott Gannon with a young helper pre feeding bait stations with non-toxic cereal pellets.

Volunteers Scott (Australian), Luke (NZ) and Danny (English) with Rik Wilson in Okia Reserve.

2.23 Suburban Trapping: This has been a highly successful project over the last year with people in the Peninsula suburbs voluntarily trapping possums in their backyards. Over 300 traps were out at different times and nearly 280 possums have been caught.

Irene Scurr, Jane Higham, Richard Higham, Bill Allen, Nigel McPherson and Project Manager at Macandrew Bay.

Volunteer Scott Gannon maintaining Timms Traps for suburban trapping.

3. Environmental Monitoring Projects

3.1 Bird Monitoring Project Summary: 35 volunteers are involved in our bird monitoring programme which takes in 22 1km transects on both private and public land on the Peninsula. We ask volunteers to aim for 6 counts per year along their particular transect, with the emphasis on collecting data in spring and autumn. Derek Onley (ornithologist co-ordinating bird monitoring at Orokanui Ecosantuary), Marcia Dale, (Ecologist at Ryder Consulting) and Moira Parker (OPBG Trustee) have set up the project and trained volunteers. Sharyn Broni, another volunteer, enters all the data and provides feedback on the annual bird surveys. An additional source of information is results of the Landcare Garden Bird Survey, undertaken by some Peninsula residents.

Bird Monitoring Volunteers from right Rik Wilson, Dave McFarlane, Mike Hazel, Leith Thompson, Jenny Winter, Sharyn Broni, Neville Peat, Lala Frazier with Derek Onley (far right)

Tui Feeding on Flax (Photo NZ Birds Online)

Bellbird (Photo –NZ Birds Online)

Map 5

1 Km Bird Monitoring transects on Public Land on the Peninsula

Table 13

Season	**Summer 1** Nov 10 – Jan 11 (Sectors 1, 2, 3 only) n=34		**Autumn 1** Feb 11 – April 11 (Sectors 1,2,3) n=7		**Summer 2** Nov 11 – Jan 12 (all sectors) n=37		**Autumn 2** Feb 12 – April 12 (all sectors) n=29	
Species	**Total**	**Average**	**Total**	**Average**	**Total**	**Average**	**Total**	**Average**
Bellbirds	90	2.6	17	2.4	141	3.8	107	3.7
Fantails	27	0.8	19	2.7	24	0.6	42	1.4
Grey Warblers	16	0.5	9	1.3	54	1.5	60	2.1
Fern birds	0	0	0	0	5	0.1	0	0
Kereru	2	0.06	0	0	7	0.2	1	0.03
Magpies	26	0.8	6	0.9	30	0.8	46	1.6
Paradise Ducks	197	5.8	12	1.7	106	2.9	121	4.2
Skylarks	130	4.8	12	1.7	77	2.1	74	2.6
Tomtits	0	0	0	0	2	0.05	0	0
Tuis	8	0.2	9	1.3	14	0.4	6	0.2

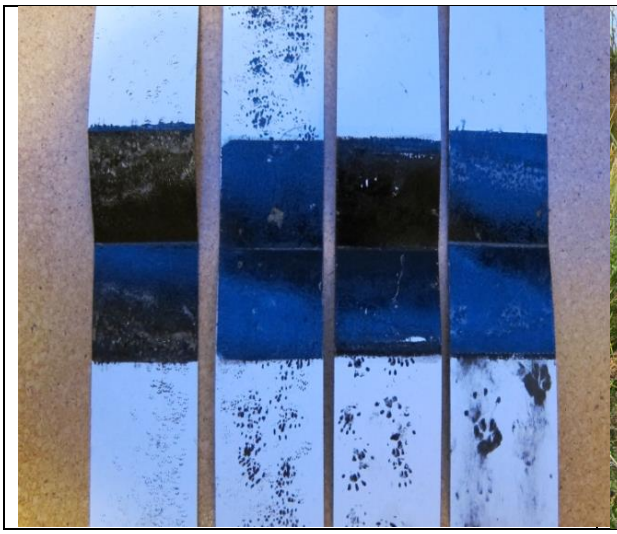
Graph 3 Comparison of total birds counted for summer and Autumn of Seasons 1 and 2 (n is the number of counts for that period).

The bird monitoring project is a long term study and involves the collection of a lot of data over a long period of time. It is too early in the study to make any inference about trends with bird numbers increasing or decreasing. As with other projects of this type throughout NZ we are expecting to see very positive benefits to birdlife on the peninsula as the possum project continues.

3.2 Rodent Monitoring Project Summary: The OPBG was aware of the importance of gathering as much information as possible about the possible ecological consequences of reducing possum numbers. The aim of the rodent monitoring project is to test if possum removal has any effect on rat numbers, as has happened in some other parts of New Zealand. Dr Deb Wilson, an ecologist at Landcare Research, Moira Parker (OPBG Trustee) and the Project Manager have been instrumental setting up this project. Volunteers made up the 100 tracking tunnels.

The use of tracking tunnels gives an index of rat numbers and indices from the same tunnels can be compared over time. Tracking tunnels are monitored both before and after possum control using the following procedures- Tracking tunnels are set in 10 lines, with each line having 10 tunnels at 50m intervals. Vegetation types representative of the Otago Peninsula are selected for the lines. Some of the tunnel lines coincide with the OPBG bird monitoring transects. Tunnels remain in position and are surveyed on a quarterly basis (Nov, Feb, May and Aug) over one fine night. An inked tracking card is placed in each tunnel, which is then baited at each end with peanut butter. The following day the tracking cards are removed, the prints identified and observations are recorded on a spread sheet.

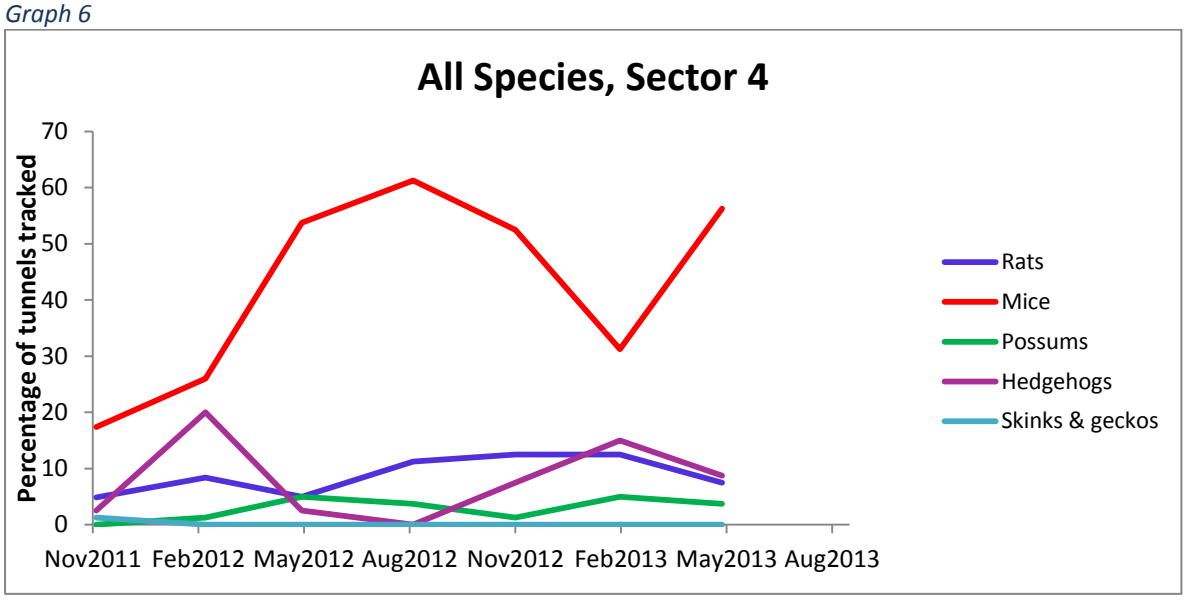
5 volunteers are responsible for particular tunnel lines, Moira Parker (OPBG Trustee) coordinates the project and Dr Deb Wilson assists with identification of animal tracks on the cards.



Rodent Tracking Cards with footprints

Volunteer Helen Clarke checking a tracking tunnel

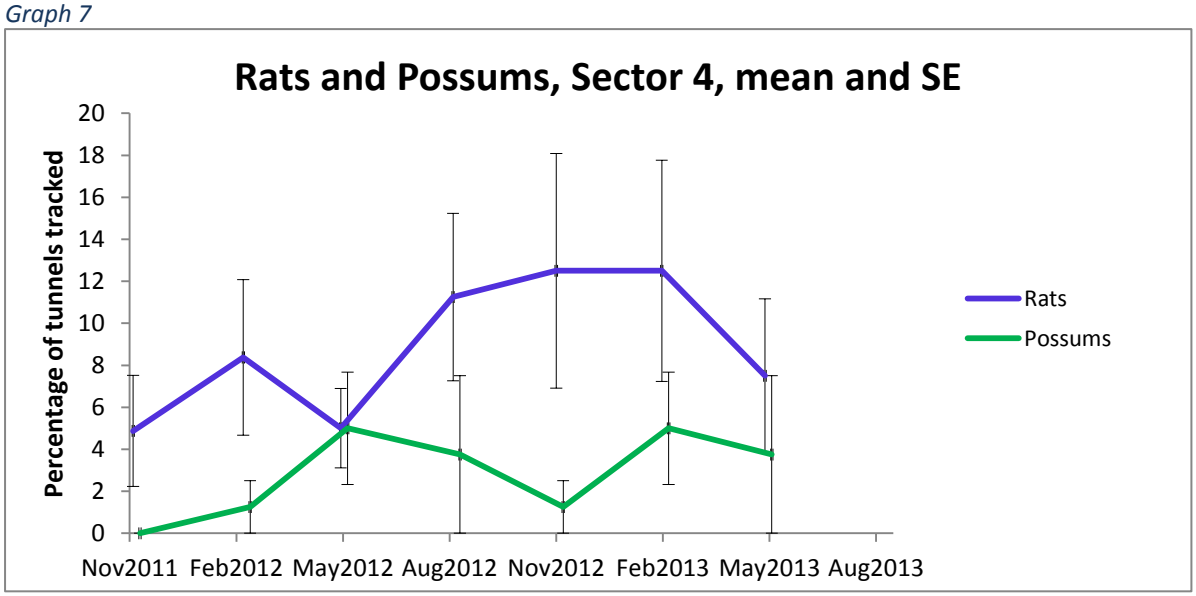
Graph 6



Rodent Tracking Data November 2011 to May 2013 (Possum Control Dec 12 to May 13)

Graph 6 above illustrates the percentage of rodent monitoring tunnels that have been "tracked" with footprints from different animals on the Peninsula. A high percentage of tunnels have recorded mice (peaking at 60% in August 2012, shown by the red line). Currently both numbers of possums and rats are tracking below 10% (see Graph 7 below). This data can really only be looked at to gauge trends as it is too early in the data collection sequence to infer any lasting conclusions.

Graph 7



Rodent Tracking Data November 2011 to May 2013 (Possum Control Dec 12 to May 13)

3.3 Vegetation Monitoring Project: Dr Robin Mitchell (Ecologist, Kunzea Consultants) was engaged to advise the OPBG and set up an appropriate programme to measure changes

in indigenous forest health and regeneration trajectories resulting from the control of possums. An important secondary purpose was to help drive and inform possible future conservation management actions on the Peninsula, other than possum control. Data was collected with two standard New Zealand forest assessment methods: the Permanent Plot Method for Monitoring Indigenous Forest (Hurst and Allen 2007) and the Foliar Browse Index (FBI) (Payton et al 1999). Having data from these two methods will allow both long and short term changes in vegetation structure to be resolved.

In April 2011 Kunzea Consultants set up a total of 14 Permanent Plots (10m by 10m) in a variety of Peninsula vegetation types. Currently we have 6 volunteers trained in this aspect of the project. 11 of the plots were monitored for Foliar Browse Index in 2012.In addition; OPBG compiles records of anecdotal observations by Peninsula residents of such things as increased fruiting of some trees, reduced browsing of garden plants etc.

All the data from the 14 Permanent Plots is part of the Landcare Research National Vegetation Survey. This project is a long term study and data collection is in its infancy. As the project continues the trust will be in a position to quantify the vegetation changes over time that have occurred.

Clockwise from top left- Vegetation Monitoring equipment, Robin Mitchell (Kunzea Consultants) and Kate Ladley (Landcare) on right, running through monitoring procedures with volunteers, Forest Canopy, Volunteer Alf Webb with Kate.

4 Public Education

4.1. Education in schools: Over the last 3 years project staff have visited schools on the Peninsula and in Dunedin to give pupils a glimpse into the reality of our current state of Biodiversity in New Zealand and what we can do on a practical level to help, through community projects such as this one on the Otago Peninsula.

Local schools on the Peninsula- Portobello School (twice), Broad Bay School (twice) and Macandrew Bay have all been visited as too have Columba College (4 times) in Dunedin City itself. It is hoped that this aspect of the project may be widened to include more schools in the future.

Year 9/10 Girls at Columba College learning about the project with Rik Wilson.

4.2 Otago University Summer School: Every summer the University of Otago runs a summer science school and over the last 3 years the Project Manager has presented and helped in workshops on day long courses focussing specifically on the problem possums present. This is set to continue into the foreseeable future. The course involves possum dissection, computer modelling of possum populations using different control methods, identification of wax tag teeth impressions, presentation and q and a on a local project (i.e. this one) and hilarious round the table role playing exercises involving interested affected parties- hunters, greenies, managers, conservationists, fur traders, animal rights activists.

4.3 Information/Workshops and Meetings:

Information kits and brochures have been distributed to the local peninsula community. 2 colour brochures and a five page information fact sheet "Key facts about possum control operations on the Otago Peninsula" has been produced and this has been circulated to all landholders in Sectors 1,2 3 and Sector 4 as well as other interested parties (over 3,000 copies to date). 12 newsletters have gone out to our mailing list over the last 3 years keeping people up to date with progress. A highly successful trapping workshop was held

right at the start of the project in 2010 and since then with contractors on the ground and the Project Manager being highly accessible further education and help has been offered to landholders as they continue trapping efforts. Over the last 3 years 8 community meetings have been held to inform and liaise with the local community.

5. Amy Adams PHD Study, University of Otago

5.1 Amy Adams PHD Study: Currently, there is limited understanding of possum spatial ecology in urban areas as the majority of research has been conducted in forest or rural habitats. This project aims to investigate the spatial ecology and identify key habitat and resource requirements of possums in urban areas within Dunedin and provide this information to the OPBG to aid in the formulation of control methods for urban areas. This study will help the Trust tailor management strategies to urban environments in the suburbs that comprise the buffer between the city and the Peninsula and the suburbs on the Peninsula itself;

Four hypotheses will be tested as follows:

1. Home ranges of possums in urban areas will be larger than possum home ranges in forested or rural habitats due to the absence of large areas with well-established, intact stands of vegetation which possums extensively forage in.
2. Within urban areas, possums will select habitats composed mainly of areas with large, well-established gardens or remnant bush fragments due to the availability of their primary dietary item, vegetation.
3. Within home ranges in urban areas, possums will preferentially select micro-habitats with well-established stands of vegetation due to the higher foraging opportunities.
4. Possums will use urban habitat types equally with respect to den locations due to the flexibility of possums to utilise many urban features as dens.

Amy Adams sedating and weighing a possum in someone's backyard as part of her field work in 2012

A possum all blinged up with ear tags and gps collar (just waking up)

6. Fundraising Summary

The financial success of the Possum Control Operations is reliant on contestable public funds from government agencies and private organisations and trusts. The trust is extremely grateful for all the financial support that we have received.
Funds provided, and the uses to which these funds were put, are summarised below.

6.1 Stage 1-Planning/ Feasibility Studies and Public Consultation:

Table 14

Stage 1 Planning / Feasibility Studies/ Community Consultation June 2008- June 2010			
Funder	***$ Applied For***	***$ Granted***	***Decision Date***
Biodiversity Condition Fund	35,000	35,000	20 Nov 2008
Otago Peninsula Trust	1,500	1,500	30 Nov 2008
Otago Peninsula Community Board	4,950	4,950	1 Jan 2009
Dunedin City Council	13,500	13,500	1 Nov 2009
Foodstuffs Community Trust	2,000	2,000	1 Jan 2010
Total	**$56,950**	**$56,950**	

These funds have enabled the OPBT to complete the following projects through Stage One-

1. Initial Community Consultation with 200 landholders of various sized farms and 1900 residents through community meetings.
2. A peninsula-wide pest survey to gauge resident's attitudes to different pest species and threats.
3. Employment of a part-time Project Manager to drive the project.

4. A Peninsula-wide Possum Monitoring operation using the Residual Trap-Catch Index (RTC) to gain an idea of possum densities and numbers on the peninsula. Carried out by industry certified pest control operators.
5. 2 colour information brochures distributed to all residents on the peninsula updating progress.
6. Establishment of website- www.pestfreepeninsula.org.nz
7. Development and writing of various reports including the initial "Possum Eradication Plan for the Otago Peninsula", "Indigenous Biodiversity Values of the Otago Peninsula" and "The Ecological Impact of Possums and relevance to the Otago Peninsula".
8. Establishment of email database of interested people/ groups
9. Liaison with Local Territorial Authorities (LTAs)
10. Set-up and establishment of the Otago Peninsula Biodiversity Trust (also known as the Otago Peninsula Biodiversity Group).

6.2 Stage 2-Project Manager Appointment/ Planning

Table 15

Stage 2 Appointment of Project Manager/ Management/ Planning June 2010-June 2013			
Funder	***$ Applied For***	***$ Granted***	***Decision Date***
Biodiversity Condition Fund	55,000	55,000	1 May 2010
Biodiversity Condition Fund	120,000	120,000	5 Dec 2011
Total	**175,00**	**175,00**	

The following has been provided for by the Department Of Conservation through the Biodiversity Condition Fund ($175,000)-

Employment of a fulltime Project Manager (32hrs/ week) from July 2010 to June 2013 (initial 3 year period) and associated operational costs such as fuel for vehicle.

This has enabled the following to date-
1. Development of the following plans- Operational Plan for the Control of Possums on the Otago Peninsula, Communication Plan, Health and Safety Plan, Risk Management Plan, Biosecurity Plan and Rapid Response Strategy.
2. Tender documents, contractor performance requirements.
3. Applications to Medical Officer of Health for use of vertebrate pesticides.
4. Auditing procedures- including toxin audits, health and safety, best practise in the field.
5. On-going Liaison with farmers and other landholders on the Peninsula
6. The successful implementation of knockdown possum control operations over 9,000 ha in Sectors 1, 2, 3 and 4 on the Peninsula.
7. Planning of Environmental Monitoring Projects (Bird, Vegetation, Rodent)
8. Successful fundraising applications to various organisations (over $395,000)
9. Newsletters out to supporters
10. Website updates
11. Media work with National TV, National Radio, Local TV and newspapers

12. Payment to independent contractor for development of Trusts Strategic Plan

Contact: Biofunds, Department of Conservation, 0800 862020, biofunds@doc.govt.nz

6.3 Stage 2-Possum Control Operations and Environmental Monitoring:

Table 16

Stage 2 Planning and Implementation of Possum Control Operations/Possum Monitoring and Environmental Monitoring Programmes, June 2010-			
Funder	***$ Applied For***	***$ Granted***	***Decision Date***
NZ Lottery Grants Board	194,159	142,551	12 Nov 2010
Peninsula Lions	1,000	1,000	1 June 2011
Speight's Environment Fund	10,250	10,250	15 July 2011
Otago Peninsula Community Board	2,500	2,000	14 July 2011
Lion Foundation	12,250	8,500	30 Sept 2011
Dunedin City Council	2,000	1,200	30 Nov 2011
NZ Lottery Grants Board	76,000	76,000	6 March 2012
DOC Otago	40,000	40,000	30 May 2012
Speight's "The Fund"	17,866	17,866	26 May 2012
Community Environment Fund	67,500	67,500	18 Sept 2012
The Southern Trust	4,032	3,518	28 June 2012
Larnach Castle (Cadbury Fund)	1,000	1,000	27 August 2012
Otago Community Trust	45,000	20,000	27 August 2012
Sam and Des Neill (Private Donation)		1,000	27 August 2012
Taieri Wool & Skins (Private Donation)		1,000	27 August 2012
Pricewaterhouse Cooper		1,000	30 August 2012
Total	**435,057.00**	**396,385.00**	

The NZ Lottery Grants Board Environment and Heritage Grant- ($142,551) provided for the following in Stage 2 Year 1 (2011)-

1. Possum Control Operations in Sectors 1, 2 and 3 on the Otago Peninsula.
2. Development and implementation of Bird Monitoring Project.
3. Development and implementation of Vegetation Monitoring Project.
4. Field equipment- monitoring traps, hip-chain, flagging tape, GPS.
5. Live Capture Cages and Timms Kill traps (for possums).

Contact: Diana Bastion, New Zealand Lottery Grants Board, 0800 824824 diana.bastion@dia.govt.nz

The Otago Peninsula Lions ($1,000) have provided-

1. Money towards operational running costs for possum control on the Peninsula

Contact: Graeme Garside, 5 Camp Rd, Pukehiki, (03) 476 0033, rggarside@xtra.co.nz

The Speight Environment Fund 2011 ($10,250) has provided for the following-

1. The establishment of a critical bait station and trap line stretching across the width of the Peninsula at Allans Beach Rd between Hooper's Inlet and Portobello and the planning and funding of the yet to be implemented line in the south of the Peninsula adjacent to the

city suburbs at Tomahawk, Shiel Hill, Waverly and The Cove. Contact: Chris Snow, Lion Nathan, chris.snow@lionco.com

The Otago Peninsula Community Board ($2,000) has provided for the following-
1. Money towards the purchase of a new quad bike and trailer to be used in pest control operations on the Peninsula.
Contact: John Bellamy, Chairman, 8 Gorman St, Macandrew Bay, Dunedin, (03) 476 1483, bellamy8@clear.net.nz

The Lion Foundation ($8,500) has provided for the following-
1. Money towards the purchase of a new quad bike and trailer to be used in pest control operations on the Peninsula.
Contact: The Lion Foundation, Air NZ Building, Smales Farm, 25 Northcote Rd, Takapuna, Auckland, www.lionfoundation.org.nz

The Dunedin City Council Biodiversity Fund ($2,000) has provided for the following-
1. Money towards the Rodent Monitoring Project on the Peninsula, specifically the making of tracking tunnels and provision of ink tracking cards.
Contact: Dunedin City Council

The NZ Lottery Grants Board Environment and Heritage Grant- ($76,000) has provided for the following in Stage 2 Year 2 (2012)-
1. Mop-Up Possum Control Operations in Sectors 1, 2 and 3 on the Otago Peninsula.
2. Buffer Maintenance Sector 3
Contact: Diana Bastion, New Zealand Lottery Grants Board, 0800 824824 diana.bastion@dia.govt.nz

The Otago Conservancy of the Department of Conservation ($40,000) provided for the following-
1. Initial Knockdown and mop-up possum control on DOC Estate in Sector 4 Otago Peninsula. Including track marking and clearing and the implementation of Bait Station Lines running from Hoopers Inlet up Sandymount and across to Sandfly Bay.
Contact: John Pearce, DOC, Otago j.pearce@doc.govt.nz

The Speight's Environment Fund 2012 ($17,866) provided for the following-
1. Community Trapping Project- Sector 4 which includes the costs of a paid contractor for 40 days, vehicle running costs and live capture cages, and associated costs like landowner letters/ mail out, batteries for gps etc
Contact: Chris Snow, Lion Nathan, chris.snow@lionco.com

The Ministry for the Environments "Community Environment Fund" ($67,500) provided for the following-
1. Possum Control Knockdown in Sector 4- Contractors, Materials, Transport, Planning, Communication with residents, Environmental Monitoring
Contact: Criggy Haas, Funds Management Team, Community Environment Fund, Ministry for the Environment, Wellington, Criggy.Haas@mfe.govt.nz

The Southern Trust ($3,518) have provided for the following-

1. A new Toshiba Laptop Computer and bag with MS office Suite
2. Two Garmin GPS 62s units
3. Two personal locator beacons

Contact: Laurel McDonald, The Southern Trust, info@southerntrust.org.nz

Larnach Castle ($1,000) have provided money for the following-

1. Money towards general operating expenses

Contact: Norcombe Barker, Larnach Castle

The Otago Community trust ($20,000) provided money for the -

1. Community Trapping Project- Sector 4 which includes the costs of a paid contractors, vehicle running costs and miscellaneous related activities.

Contact: Carol Melville, The Otago Community Trust, info@oct.org.nz

Sam and Des Neill made a generous private donation ($1,000) which provided for money towards the purchase of a Loadwell Quad trailer.
Contact: Sam Neill, Allans Beach Rd, RD2 Dunedin 03 4780878

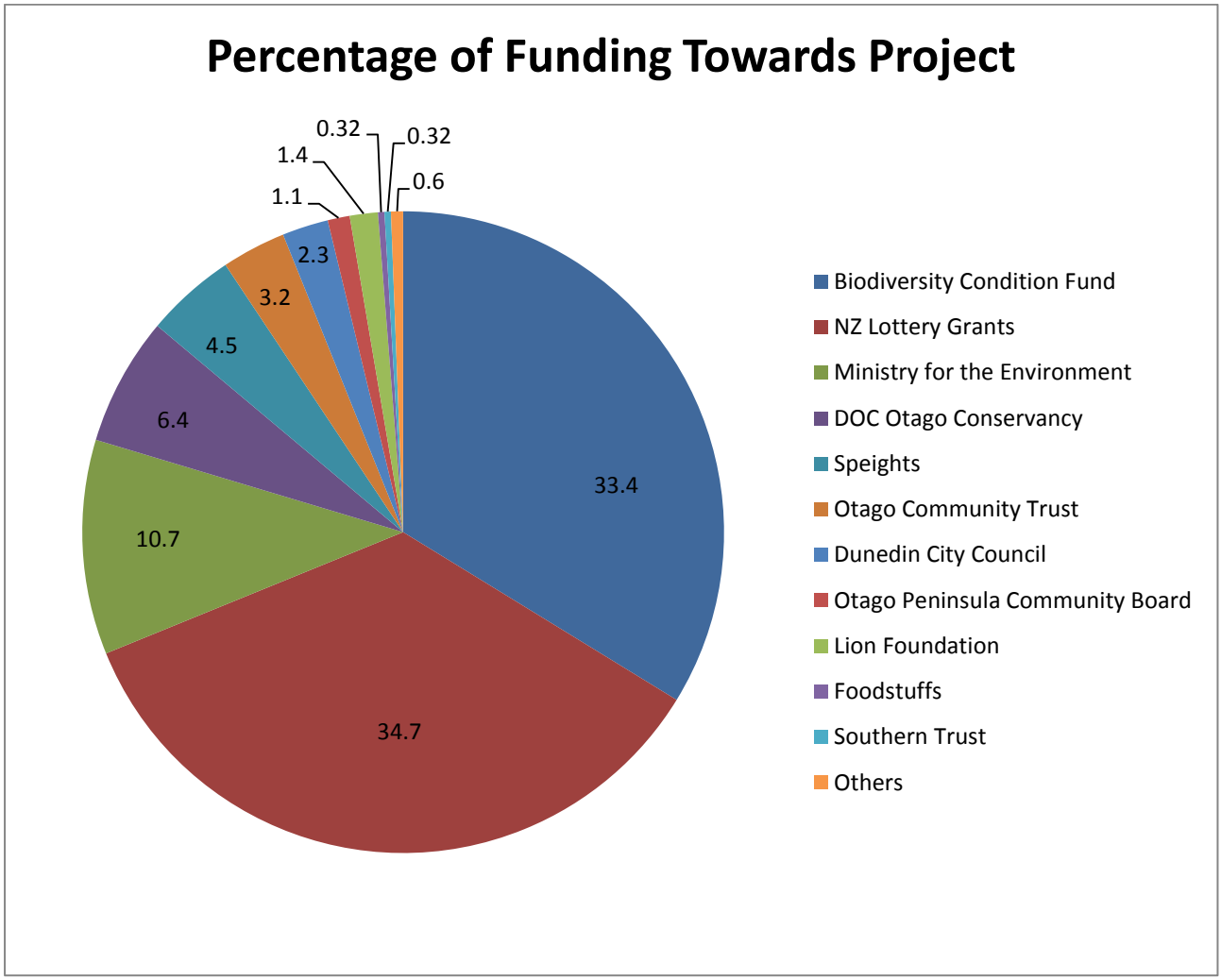
Taieri Wool made a generous private donation ($1,000) which provided for money towards the purchase of a Loadwell Quad trailer.
Contact: Taieri Wool and Skin

Pricewaterhouse made a generous donation ($1,000) through their employee "Volunteer" Matt Anderson. This was put towards general operation costs associated with the project.
Contact: Matt Anderson, Pricewaterhouse

An example of the signs used on the Peninsula acknowledging funding

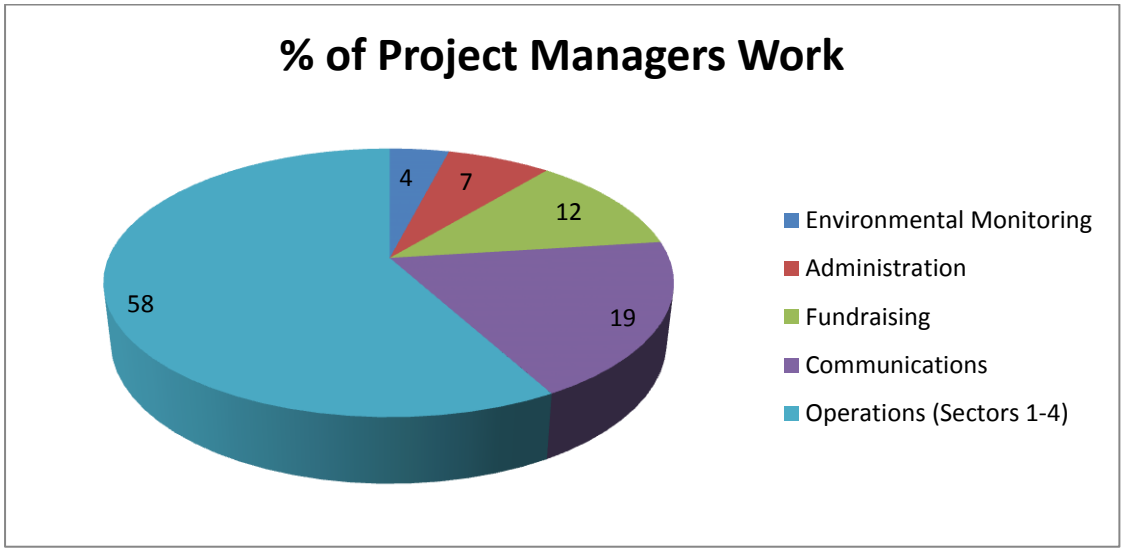
6.4 Pie Chart of Percentage of All Funding Sources:

Chart 1



7. Project Managers Allocated Time

Chart 2



8. Summary of Media Links to Websites

http://tvnz.co.nz/close-up/massive-possum-eradication-under-way-video-5233476

http://www.ch9.co.nz/node/95885

http://www.odt.co.nz/news/dunedin/215699/more-peninsula-possum-trapping

http://michaelwoodhouse.co.nz/index.php?/archives/330-Press-Release-Otago-Peninsula-conservation-work-receives-funding-boost.html

http://digital.thestar.co.nz/olive/ode/str_daily/LandingPage/LandingPage.aspx?href=U1RSLzIwMTIvMDkvMjA.&pageno=Nw..&entity=QXIwMDcwMA..&view=ZW50aXR5

http://www.odt.co.nz/news/dunedin/151394/possum-control-progressing-well-otago-peninsula

http://www.odt.co.nz/news/dunedin/144443/possum-kill-funded

http://www.odt.co.nz/news/dunedin/163419/control-work-taking-effect

http://www.ch9.co.nz/content/possum-control-operation-move-residential-areas-peninsula

http://www.odt.co.nz/news/dunedin/167710/possum-traps-ready-go-out

http://straightfurrow.realviewtechnologies.com/?iid=49482&startpage=page0000041

Other Media Events:

Highlanders squad taking a break at Sandymount

Prop Chris Snow being interviewed

Highlanders Day Sandymount Reserve

Dead Possums

Allison Balance Radio NZ interviewing Brendon Cross

At Okia Reserve with Yellow-Eyed Penguin Trust