

# The Sinbad Sanctuary Project

Sinbad Gully, Milford Sound

ANNUAL REPORT 2009/2010



Department of Conservation  
*Te Papa Atawhai*



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JUNE 2010

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Published by Department of Conservation  
Southland Conservancy  
PO Box 743  
Invercargill  
June 2010  
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Print ISBN: 978-0-478-14807-7  
Web ISBN: 978-0-478-14808-4

## CONTENTS

Executive Summary	5
Introduction	6
Predator Control	7
Stoats - Establishment of trap network and trapping results	7
Rodents - monitoring	8
Possums	9
Monitoring of Outcome Species (Protected Species)	10
Whio (Blue duck)	10
Sinbad skink	11
Snail finding	11
Forest Health	12
Other species noted during field trips	12
Planned and Actual Budget for 2009/10	15
Operational Objectives For 2010/11	17
Planned Budget for 2010/11	18
References	19
Acknowledgements	20
Appendix 1: Location Map of Sinbad Valley	21
Appendix 2: Location Map of Traps	22



# Executive Summary

This year, through a partnership with Southern Discoveries and Fiordland Conservation Trust, the Department of Conservation began the Sinbad Sanctuary Project in Milford Sound (see Appendix 1 for location map). Otago Community Trust and Lottery Environment and Heritage funds also granted funds to seed this project.

Establishing a stoat control network was the priority task this year with the aim to protect a range of threatened species. Investigations on the Sinbad skink in the alpine basin also took place to further determine the distribution of the species. Mechanisms were put in place to determine predator abundance and to determine characteristics of refugia during winter months. Attached is a detailed report of the Sinbad skink investigatory study.

After the initial knockdown of stoats, very low numbers have been trapped in the valley. Similarly very low numbers of rats have been trapped in the stoat traps.

Key species that will benefit from stoat control present in the valley are kiwi (*Apteryx australis*), whio (*Hymenolaimus malacorbynchos*), weka (*Gallirallus australis*), kea (*Nestor notabilis*) and kaka (*Nestor meridionalis meridionalis*). Pre and post breeding whio monitoring took place, following on from previous years. Three pairs were located in the valley, the same number as back in 2005/06 season. Kiwi and weka were observed in the valley in low numbers. Very low numbers of mohua were also noted. The South Island robin appears to be absent within the valley.

Another species of interest found during stoat control establishment was a snail, most likely a Powelliphanta, which is a relatively rare giant predatory landsnail. Further investigations are required to fully identify the species present in the Sinbad Gully.

Rodent monitoring was established in the alpine basin to ascertain mouse abundance in the skink habitat. Sixteen i-button data loggers are currently in place recording temperature and hydrological information in occupied and unoccupied skink sites in the Sinbad Gully head basin. The aim of this is to help us understand why the Sinbad skink survives here in the Sinbad Gully, but has not yet been located in any other site.

Possums appeared to be in reasonable numbers along the river flats. Deer sign was seen in the valley, however they appear to be low in numbers. This was also reflected in the healthy appearance of the forest understory.

# Introduction

The Sinbad Valley Project is being undertaken by the Fiordland Conservation Trust through a partnership with Southern Discoveries. Southern Discoveries have entered into a long term commitment with the Trust to fund this project in an effort to protect an incredibly special and unique part of New Zealand.

The Sinbad gully is located close to the head of Milford Sound on the southern side and is within Fiordland National Park and the Te Wāhipounamu - South West New Zealand world heritage area. Mitre Peak and the main ridge of which it is part of, forms the northern wall of the valley. For these reasons the Sinbad is within one of New Zealand's and arguable the worlds most iconic tourist destinations.

The Sinbad gully has a natural barrier of steep terrain, combined with a cold, wet climate which has limited the invasion of mammalian predators. These attributes have contributed to making it a safer refuge for rare lizard species including the Sinbad skink which were only recently discovered and are only known to the Sinbad Gully. Other species include rock wren, kea, whio, kiwi, large weta and other large colourful invertebrates. It was also one of the last refuges of kakapo in Fiordland. The Sinbad Gully has all the makings of a spectacular and unique conservation project.

The objective of this project is to control a number of introduced animal pest species to very low levels and maintain their densities at low levels within the Sinbad Gully, an area of approximately 1500 ha. This will allow native species present in the Sinbad to increase in number, and create a new safe site where threatened species may be reintroduced in the future. The animal pests that we propose to control have a serious impact on native wildlife through direct predation and competition for food. Control of both possums and stoats will be the key focus for this project. In time if funding allows rat control may also become a focus in the valley floor and mouse control may take place in the alpine basin at the head of the valley. Deer control would also help to maintain the integrity of the vegetation in Sinbad Gully, what appears to be a relatively intact forest system compared to many other areas in Fiordland beech forest. Ongoing control work is required to maintain low predator densities.

# Predator Control

## STOATS - ESTABLISHMENT OF TRAP NETWORK AND TRAPPING RESULTS

### Track cutting August-December 2009

The 7km stoat line track was cut and marked running down the centre of the Sinbad Valley. The track was marked using orange triangles and the trap locations using pink triangles. Construction of the track took forty-two person days to complete, which included a ten and five day trip in August and one three day trip in December. The team did exceptionally well in the cold conditions of snow and ice in August.

### Stoat trap placement December 2009

Seventy-four stoat traps were flown in and set up along the track at 100

metre spacing for the length of the valley. Fourteen people took part in establishing the trap network, of which four were Southern Discoveries staff. See trap location map in Appendix 2.

Three trap boxes have been placed in the alpine basin. Each box has a single DOC 200 trap baited with an egg and meat (beef). The traps were initially left unset. This technique of pre baiting the traps is believed to increase the first catch when the traps are activated, reducing the number of stoats in the valley at a faster rate than if set in the initial baiting.



Right - Southern Discoveries staff member Jorge labouring under heavy stoat traps.

Below - Milford Helicopters place stoat trap bundles along the track. DOC



### Stoat control January 2010

The initial trap check, prior to them being set, took place in January 2010. Both the egg and meat were taken from *every* trap box. All traps were set and re-baited. A total of 4 trapping checks have since been completed. Twelve stoats were caught in the first trapping period. It was expected

a high number of stoats would be caught after the traps were first activated. The small rise in numbers caught later in the year (May), was also experienced throughout other areas of Fiordland. This correlates with the moderate mast beech seeding event experienced. The results are shown in the table below.

TABLE 1: STOAT CONTROL RESULTS FOR SINBAD GULLY

DATE	STOATS	RATS	SPRUNG/EMPTY	OTHER
11/2/10	12	1	1 (stoat paw found)	
26/2/10	0	1	0	
08/4/10	1	1	1	
19/05/10	3	5	1	

## RODENTS - MONITORING

Rodent monitoring using tracking tunnels has begun in the alpine lizard habitat. Tunnels have been constructed for monitoring lines in the main valley. This method of monitoring provides a coarse index of relative abundance; they are not a direct measure of population density, but a measure of activity. However they can be reasonably sensitive to the presence of rodents (particularly rats) when they are present at low densities. Therefore, the technique can be a useful management indicator for determining when it is necessary to control rodents and the results of rodent control operations.

Due to savings made in the budget this year (see 2009/10 Budget later in this publication), we were able to purchase materials for, and construct, 100 tracking tunnels. The tunnels are made of a tanilised wood base and strong plastic covers, a robust design suitable for extreme environmental conditions. Cards with ink in the centre are placed in each tunnel and baited with peanut butter in the centre of the card. Tunnel covers are longer than standard with brackets clipped on the ends to prevent possums, weka and kea tampering with the tracking cards.



Tracking tunnel showing strong plastic cover with extra length and a metal bracket to prevent possums, weka and kea tampering with monitoring card. *DOC*

Four lines of ten tunnels were laid out in the alpine basin on the 2<sup>nd</sup> June 2010. Standard operating protocol using tracking tunnels to monitor rodents and (Gillies et al 2003) was used to survey the alpine basin for the night of 2<sup>nd</sup> June. No mice or rats were tracked for this night. The tunnels were left set. We hope to revisit the valley at the end of June to check for any sign of rodent movement in the lizard habitat in early winter.

We plan to establish another 10 rodent monitoring lines in the valley this year.

## POSSUMS

As planned no work was completed this year. A pre control monitor using the residual trap catch method (RTC) is planned to take place next year. No control is planned for next year at this stage. The Department of Conservation plans to coordinate the Sinbad possum control operation with a neighbouring possum job to reduce costs. This operation is planned for financial year 2011/2012. The type of control used will depend on results from the pre possum monitor.

# Monitoring of Outcome Species (Protected Species)

## WHIO (BLUE DUCK)

Two survey trips occurred which involved walking and searching for birds along the full length of the Sinbad River. See the map below for whio locations.

The pre breeding whio survey that took place in November 2009 found seven whio in total. Two unbanded pairs were located and another three single birds. One of the individuals, Y/M called Sinbad (sex-male), was banded in the Sinbad Valley in 2006. The second individual was a banded juvenile from the Arthur River, hatched summer of 2004, being either Red Rocket or Houdini (sex-male). The bird was wearing an expired transmitter and a metal band on the right leg. The left leg was not seen. The third single was an unidentified bird.



Another pair was seen during December 2009 when stoat trap laying took place. This was some distance from the other two pairs located and therefore recorded as a third pair in the valley.

The post breeding survey in January 2010 found three lone adults and a lone juvenile. The adults were Y/M (Sinbad), a lone male and one identified bird. One juvenile was also

located. It is possible that some whio were moulting at this time, which means they can go undetected especially if roosting some distance from the river. Both survey trips found additional sites with pooh where no whio were sighted, which suggests others were present but not seen.

Table 2 details the whio survey results in the Sinbad Gully from 2005 - 2010.

TABLE 2: SUMMARY OF WHIO PRODUCTIVITY IN THE SINBAD GULLY 2005 - 2010

SEASON	SURVEYED WATER (KM)	PAIRS KNOWN	PAIRS / KM	DUCKLINGS SEEN	JUVENILES SEEN	FLEDGED JUVENILES / PAIR	SINGLES
2005/2006	4	3	0.75	0	3	1	0
2006/2007	5	2	0.4	0	0	0	2
2007/2008	7	2	0.29	0	1	0.5	2
2008/2009	7	2	0.29	0	0	0	2
2009/2010*	7	3	0.43	0	1	0.33	3

\* Trapping initiated.

Map of whio (blue ducks) locations.

## SINBAD SKINK

See separate report attached - Sinbad skink investigatory study.

## SNAIL FINDING

Three snails were seen one warm night in December 2009 during the track cutting trip. They have not been fully indentified yet. Unfortunately photos taken have been lost. Two snails were found together on moss under a freshly cut astelia on the edge of the track between stoat trap sites 65-66. They were described as, about 20-25mm across and shiny brown with no patterning, possibly a little darker in the centre (Phred Dobbins pers. com.).

From the description they are considered to be a giant predatory landsnail in the family Rhytidae and most likely a species of *Powelliphanta*. There are three known species of *Powelliphanta* snails in the Fiordland region, *P. vittatus*, *P. spedeni* and *P. fiordlandica*.



Photo of *Powelliphanta vittatus* snail shells found in Professor Creek.

The species found closest to Sinbad Gully, *P. vittatus*, has been seen in very small parts of the large area between Jackson's Bay and the mouth of Milford Sound in South Westland (Walker, K. J. 2003). Little is known about the size of the population of *Powelliphanta* "vittatus" today. In the absence of population trend data *Powelliphanta* "vittatus" is classified as 'range restricted' by Hitchmough (2002). Because of its small fragile shell and tall forest habitat, most populations of *Powelliphanta* "vittatus" seem to be suffering heavy predation by introduced thrushes, and occasionally by rats (Walker, K. J. 2003). It is also possible that stoats and possums are also a threat to the snails in Sinbad Gully.

The species in Sinbad Gully could also be *Powelliphanta fiordlandica*. *P. fiordlandica* is classified as 'vulnerable' by Hitchmough (2002). The thrush is also considered to be a contributing factor to the decline of this species. Native predators also include weka and kiwi of which are both present in the Sinbad Valley. Due to its distinctiveness from the other *Powelliphanta* snails this species is about to be

Photo of *Powellipbanta fiordlandica* snail shells found in Southern Fiordland.



separated into its own genus (Kath Walker pers. com.). It would be very interesting if Sinbad snails are *fiordlandica* as it would mean the species distribution is much greater than presently known.






## FOREST HEALTH

In the late 1960s deer had not yet penetrated the valley and still today there only appears to be a small number of individuals in the valley. This is reflected in the abundance of palatable understory species compared to other sites in Fiordland. Healthy specimens of deer palatable species such as lancewood (*Pseudopanax crassifolius*), threefinger (*P. simplex*), fivefinger (*P. arboreus*) and broadleaf (*Griselinia littoralis*) are prevalent in all height tiers in the valley floor.

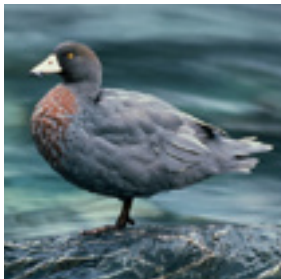



## OTHER SPECIES NOTED DURING FIELD TRIPS

Very few mohua were heard near the head of the valley. Kiwi were heard at the mouth of the valley from the campsite. A number of weka were seen along the lower section of the valley and what appeared to be dense population, inhabited the alpine basin at the head of the valley. Five rock wren pairs were found in the alpine cirque while carrying out lizard surveys. This appeared to be a healthy population. The South Island robin was not seen during any of these field trips. See table three for more details about these in the Sinbad Gully.

TABLE 3: NATIVE SPECIES OF SIGNIFICANCE WITHIN THE SINBAD GULLY AND THEIR STATUS

NATIVES SPECIES	DOC NATIONAL CLASSIFICATION STATUS	SINBAD VALLEY STATUS	MANAGEMENT REQUIRED
<b>LIZARDS</b>			
Sinbad skink 	Data deficient  Only current known location is in the hanging valley at the head of the Sinbad	Population estimate unknown. Searches in neighbouring basins have not located any further populations.	Determine the extent of habitat occupied and skink abundance; improve trapping techniques; determine the impact of rodents; characterise the climate; continue surveys for new populations.
Cryptic skink 	Gradual decline  Ranges widely in Otago and Southland.	Sinbad only one of two sites currently known in Fiordland - Sinbad, Transit. These two populations exhibit certain unique morphological characteristics from other areas	Cryptic skinks will likely benefit as a result of the work taking place on Sinbad skinks where Cryptic skinks are also found.
Cascade gecko 	Data deficient  Occurs in Northern Fiordland and South Westland	Sinbad one of three sites currently known - Sinbad and Esperance (Fiordland), Cascade Plateau (South Westland)	Cascade gecko will likely benefit as a result of the work taking place on Sinbad skinks where Cascade gecko are also found.
<b>BIRDS</b>			
Mohua (Yellowhead) 	Nationally endangered	One bird was seen at trap 5 near the head of the valley. A small group were heard on another occasion in the same area.	Controlling rats to densities no higher than 5% tracking rate and stoats to non detectable tracking rates would enable the valley to sustain a healthy population of mohua. If predators are controlled to these levels then carrying out a translocation in to the valley would be recommended to boost the population.
Kiwi (Southern Tokoeka) 	Gradual decline	While the team where track cutting a number of evening surveys were carried out playing calls to solicit response. Kiwi were heard near the mouth of the valley.	Kiwi chicks remain vulnerable to stoats until they weigh 1.2kg, which means they are vulnerable for up a year after hatching. Possums are also a known predator of kiwi. Controlling stoats and possums to very low numbers in the valley will benefit the kiwi population.

Lizard photos -  
James Reardon

<p>Whio (Blue Duck)</p> 	Nationally endangered	Two pairs and three singles located in November 2009.	Stoats prey on whio during nesting. Possums are also known to disturb whio while in the nest and are expected to prey on whio eggs also. Controlling possums and stoats in the valley will benefit the whio population.
<p>Rock Wren</p> 	Nationally vulnerable	Five pairs located in the hanging alpine valley. Going by the density of pairs, appeared to be a healthy population.	Stoats and mice are known to predate on rock wren. The three stoat boxes laid out in their habitat will benefit the population.
<p>Western Weka</p> 	Serious decline	A number of birds were seen in the valley during track establishment. The population appears to be low.	The stoat control will be benefiting the population.
<p>Kakaruai (South Island robin)</p> 	Not threatened	No robins seen in the valley.	Stoats and rats both predate on robins. Controlling rats to density no higher than 5% tracking rate and stoats to non detectible tracking rate would enable the valley to sustain a healthy population of robins. Stoats are presently being controlled to very low numbers. If rats are controlled to these levels then relocating robins back in the valley would be recommended.
<b>INVERTEBRATES</b>			
<p>Unidentified snail</p> <p>From description - Giant predatory landsnail in the family Rhytidae and most likely a species of Powelliphanta.</p>	In western South Island forests these snails are in decline most likely due to predation by a range of exotic animals including thrush, rodents, stoats and possums.	Three live specimens seen. Possibly <i>P. vittatus</i> or could also be a species yet to be described.	Survey the valley to locate and identify the species. Stoat control will likely be benefiting these snails in the valley.

\* **Data deficient** - Due to insufficient knowledge of their population biology and distribution

# Planned and Actual Budget for 2009/10

SINBAD GULLY SANCTUARY YEAR ONE BUDGET	NUMBER	\$/UNIT	COST		VARIANCE	EXPLANATION FOR VARIANCE
			PLANNED	ACTUALS		
<b>Stoat trap setup</b>						
Stoat traps and boxes	100 boxes	\$50.00	\$5,000.00	\$6,623.00	-\$1,623.00	Increase in trap box material costs and higher labour costs than anticipated
Stoat trap line establishment, 7000m (\$300 pp/day)	7000 metres	\$1.45	\$10,155.56	\$10,865.60	-\$710.04	
Hughes D - 3 flights for staff and 1 for placement of bundles of boxes	1.7 hours	\$1,425.00	\$2,400.00	\$1,120.00	\$1,280.00	DOC boat available to use for transporting some of the team to set boxes out and trap box bundles laid out in good time by helicopter
Squirrel B2 - fly bivvy in and out and fadge of stoat boxes	1.3 hours	\$1,985.00	\$2,577.78	\$850.00	\$1,727.78	Bivvy not used in the end, so only one flight for boxes and people
Servicing trapline - helicopter (Hughes D) and 1 paid person for day (+ volunteer)	4 checks	\$800	\$3,200.00	\$3,200.00	\$0.00	
Field Equipment			\$888.89	\$377.00	\$511.89	Savings made using DOC equipment
<b>Reptile monitoring and protection work</b>						
Lizard contractor - field trip	10 days	\$200/day	\$1,777.78	\$1,800.00	-\$22.22	
Flight (B2) drop off and pick up	0.9 hours	\$1,985.00	\$1,751.11	\$1,740.00	\$111.11	
Groceries for field team of 4	10 days	\$20pp/day	\$800.00	\$700.00	\$100.00	
Field Equipment			\$435.55	\$2,000.00	-\$1,564.45	Due to savings made in helicopter costs we were able to purchase 6 ibottoms for gathering climatic data (see section ??? For details)
<b>Project Manager</b>						
DOC employee	270 hours	25.50/hour	\$6,880.00	\$5,500.00	\$1,380.00	Dollars saved due to DOC covering some project management costs
<b>EXTRA WORK COMPLETED DUE TO COST SAVINGS</b>						

Small Mammal Monitoring setup									
Construction of 100 tracking tunnels				\$0.00	\$780.00	-\$780.00	Some of the tracking tunnel materials and labour to build the tracking tunnels covered by DOC		
Laying of 40 tracking tunnels in alpine headbasin			\$0.00	\$0.00			Cost covered by DOC		
Sub Total			\$35,866.67	\$35,555.60					
GST			\$4,483.33	\$4,444.45					
Totals for July 2009 - June 2010			\$40,350.00	\$40,000.05					

INVOICE TO FIODLAND CONSERVATION TRUST - JUNE 2010 \$40,000.00

# Operational Objectives For 2010/11

- Service and maintain stoat traps in the lower valley (74 traps) and hanging valley at the head of the gully (3 traps) ten times within the year.
- Carryout pre possum control monitoring, to establish an estimate of possum density in the gully. The method of possum control will be determined after information is gathered using the standard monitoring method, residual trap catch (RTC) (National Possum Control Agencies 2008).
- To improve our understanding of the abundance of Sinbad skinks in the head basin so that population trends can be monitored, particularly in response to management. Improved abundance monitoring will require establishing access to the entire skink habitat by rope from above and below the rock wall to determine the extent of the habitat Sinbad skinks occupy, and then to intensively monitor a portion of this habitat to generate an estimate of abundance. New techniques also need to be developed to deploy and check Gee's minnow traps that will enable more sensitive and intensive monitoring. The rodent monitoring and climate investigations will be continued until next summer with the results from this work influencing future work required in these areas.
- Carryout rodent monitoring in the alpine Sinbad skink habitat and in the main Sinbad Gully to establish estimates of rodent abundances. The method used will be tracking tunnels as described in the rodent section of this report.
- Continue the annual monitoring of whio in the Sinbad River with two trips, pre and post breeding.
- Investigate suitable methods of deer control and establish operational plans and budgets to be undertaken as further funds become available.
- Carryout surveys to locate and ascertain the abundance of kiwi, weka and mohua in the Sinbad Gully.
- Search for the snails in the valley so the species can be fully indentified.

# Planned Budget for 2010/11

## SINBAD SANCTUARY YEAR TWO

STOAT TRAP SERVICING - 10 TRAP CHECKS PER ANNUM			
Bait (egg and meat)	740 traps	\$0.54	\$400.00
Wages for 1 person (including HP + ACC)	80 hours	\$23.00/day	\$1,840.00
Helicopter (20 flights)	3.32 hours	\$1,425.00/hour	\$4,731.00
Managing operations (Keri Antoniac)	80 hours	\$65.00/hour	\$5,200.00
Contribution from doc	80 hours	-\$35.00	-\$2,800.00
<b>Total</b>			<b>\$9,371.00</b>
Possum control averaged over 5 years			
Pre control monitoring	10 lines	\$400/line	\$4,000.00
Flights for possum monitoring team x 2 (hughes)	0.5 minutes	\$1,425.00/hour	\$712.50
Possum control aerial	1500 hectares	\$32.00 / hectare	\$48,000.00
Post control monitoring	10 lines	\$400 /line	\$4,000.00
Flights for possum monitoring team x 2 (hughes)	0.5 minutes	\$1,425.00/hour	\$712.50
Project Management (Michelle Gutsell)	24 hours	\$65/hour	\$1,560.00
Contribution from DOC	24 hours	-\$35/hour	-\$840.00
Possum control planning (Michelle Gutsell)	80 hours	\$65/hour	\$5,200.00
Contribution from DOC	80 hours	-\$35/hour	-\$2,800.00
Total			\$60,545.00
<b>Total averaged over 5 years</b>			<b>\$12,109.00</b>
Small mammal monitoring establishment and initial monitor			
Wages establishing tracking tunnel lines	24 hours	\$23.00/day	\$552.00
Running lines	40 hours	23.00/day	\$920.00
Helicopter (2 flights)	0.5 hours	\$1,425.00/hour	\$712.50
Groceries for team of two	4 days	\$40.00/day	\$160.00
Field equipment			\$600.00
Project management	40 hours	\$65.00	\$2,600.00
Contribution from DOC	40 hours	-\$35/hour	-\$1,400.00
<b>Total</b>			<b>\$4,144.50</b>
Reptile monitoring and protection work			
Lizard contractor x 2 - field trip	20 days	\$200.00	\$4,000.00
Flight (hughes) x four for two trips	1 hour	\$1,425.00	\$1,425.00
Groceries for field team of 4	10 days	\$80/day	\$800.00
Field equipment			\$675.00
<b>Total</b>			<b>\$6,900.50</b>
<b>Total</b>			<b>\$32,525.00</b>

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# Acknowledgements

Firstly we would like to sincerely thank Southern Discoveries for so generously sponsoring the Sinbad Sanctuary and for their effort in promoting the project through their business. It has been a pleasure working closely with Fiordland Conservation Trust and Southern Discoveries to establish the Sinbad Sanctuary project. We thank members of the Fiordland Conservation Trust and manager Rachel Cockburn for facilitating in establishing this successful partnership between the parties.

Likewise we are very grateful to the Otago Community Trust and Lottery Environment and Heritage funds for the much needed funding grants to help in the initial year of the project.

Thank you for the support and great effort from the large team of people that have taken part in the operations in the Sinbad Gully over the year. The team that endured the bleak conditions of winter cutting the majority of the seven kilometre track was an exceptional effort by Martin Gerret, Pete Kirkman and Sanjay Thukar, two of which were blessed with a total of five minutes sunshine throughout the entire first ten days. Thanks also to the December team Phred Dobbins, Steven Horn, Ben Crouchley and Megan Willans for finishing the last three kilometres of the track.

The efforts of all those involved in laying the stoat traps out and checking them were greatly appreciated. The high level of energy and commitment expressed from Southern Discoveries staff in helping with the work on the ground has helped significantly in achieving the goals of all aspects of the project, including the stoat trapping and lizard and whio monitoring.

Thanks also to Hannah Edmonds, James Reardon and the alpine team carrying out the lizard work. This is a challenging environment to work in and a difficult species to observe, however much has been learnt to date.

# Appendix 1: Location Map of Sinbad Valley



## Appendix 2: Location Map of Traps

