



The Sinbad Sanctuary Project

Sinbad Gully, Milford Sound
2013/14 Annual Report



mes: T. Reardon



Department of
Conservation
Te Papa Atawhai

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Sue Lake, Hannah Edmonds, James Reardon & Erina Loe

Department of Conservation
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Cover image- Sinbad Skink in Sinbad cirque. James Reardon/DOC

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Fiordland District Office
PO Box 29
Te Anau 9600

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Executive Summary

Through an ongoing partnership with Southern Discoveries and the Fiordland Conservation Trust, the Department of Conservation has undertaken the fifth year of restoration in the Sinbad Sanctuary Project in northern Fiordland National Park. The 2013/14 year saw a continuation of the stoat trapping, beech seed monitoring, whio and lizard monitoring. Southern Discoveries has continued to provide the primary financial support which has made the project possible.

Beech seed fall monitoring recorded low levels of silver beech seed between February and July 2014 in the Sinbad Gully. Rodent and mustelid levels remained low this season in response and whilst rodents are predicted to remain low for the rest of the 2014/15 season there is a possibility that stoat numbers will increase towards autumn as stoats disperse out of adjacent areas not treated with 1080.

During the 2013/14 year a total of ten stoat trap checks were carried out recovering a total of 10 stoats and 34 rats. Stoat numbers were generally low through the year, with a small peak in January and February when young animals would be leaving the den. Rat numbers were generally low all season with a peak of 10 animals caught in August 2013.

Annual occupancy monitoring of Sinbad and cryptic skinks was undertaken during 4 -5th March with a team based in the Sinbad head basin. Luke Johnston from Otago University trialled and evaluated timelapse monitoring tools for alpine lizards as part of a Postgraduate Diploma in Wildlife Management. Results suggest that current manual techniques remain more informative than remote monitoring.

1.0 Introduction

The Sinbad Gully is nestled beneath the world famous Mitre Peak in Milford Sound, situated in the northern part of Fiordland National Park (Fig 1). The area is characterised by extremely steep glacially carved side walls with near-vertical granite cliffs covered in dense silver beech forest. This extreme topography is not only stunning but provides a level of ecological isolation that may have contributed to it being one of the last places in Fiordland where kakapo (*Strigops habroptila*) were found on the mainland in the 1960s and 1970s. The Sinbad skink (*Oligosoma pikitanga*) is currently only known from one small area of rocky cliff habitat in the alpine cirque at the head of the Sinbad Gully.

A significant geographical feature of Sinbad Gully is its proximity to the tourist hub of Milford Sound. This proximity provides an opportunity for demonstrating both the pressures on the mainland forest ecosystem and also the tools and techniques available to mitigate these pressures.

The Sinbad Sanctuary project was established in 2009, as a partnership between Southern Discoveries (a local tourism operator), Fiordland Conservation Trust, and the Department of Conservation. The aim of the project is to enhance the ecological values of the area. This will be done by reducing invasive pests in order to protect the endangered species that still

survive in the valley today, and possibly allow future reintroductions for species that are no longer present in the valley.

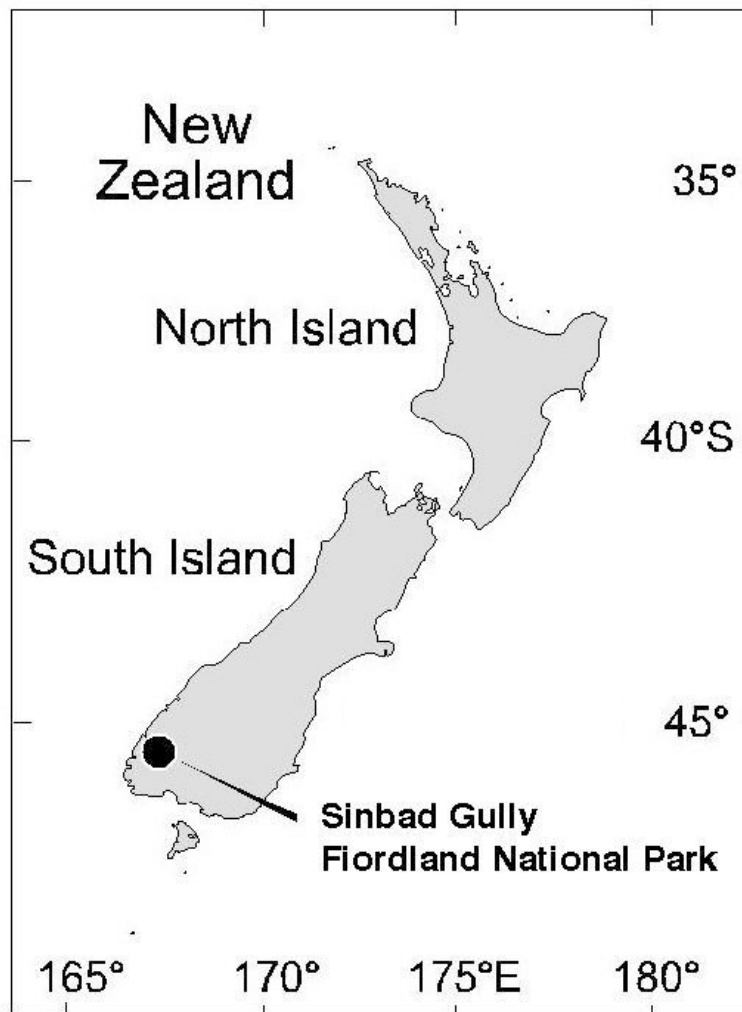


Figure 1- Location of Sinbad Gully in the southwest of New Zealand.

1.1 Flora

Silver beech-((*Lophonozonia menziesii*) forest dominates the valley floor in the Sinbad Valley. There is a notable absence of mountain beech (*Fuscospora cliffortioides*), southern rata (*Metrosideros umbellata*) and rimu (*Dacrydium cupressinum*) except on the valley walls where these species are locally dominant.

Typical sub-canopy trees include kamahi (*Weinmannia racemosa*), lancewood (*Pseudopanax crassifolius*), haumakaroa (*Raukaua simplex*), broadleaf (*Griselinia littoralis*) and mahoe (*Meliclytus ramiflorus*). The tall shrub layer includes peppertree (*Pseudowintera colorata*) and soft tree fern (*Cyathea smithii*). The shrub layer up to 3 metres is dominated by a number of different species of *Coprosma* as well as rohtu (*Neomyrtus pedunculata*).

Dense fern growth is a characteristic feature of the Sinbad valley and is thought to be the direct result of low browsing pressure from introduced ungulates. The fern flora is particularly rich with 53 species including 15 species of filmy fern (*Hymenophyllum* and *Trichomanes*), and 11 *Blechnum* species. Prickly shield fern (*Polystichum vestitum*), hen and chicken fern (*Asplenium bulbiferum*) and crown fern (*Blechnum discolor*) frequently form a dense lower tier within the forest while the Prince of Wales fern (*Leptopteris superba*) is mainly found on shadier and damper slopes.

In the upper valley, there are some large areas of regenerating forest with seral species re-colonising debris slopes after rock avalanches. Fuchsia (*Fuchsia excorticata*), pate (*Schleffera digitata*) wineberry (*Aristotelia serrata*) and mountain ribbonwood (*Hoheria glabrata*) dominate and form a dense forest of about 8-12m in height.

The alpine cirque is dominated by mid-ribbed snow tussock *Chionocloa pallens*, patches of curled snow tussock (*C. Crassiuscula*) and a variety of alpine herbs and shrubs amongst large rock jumbles. Sheer rock walls dominate the head of the cirque. The vegetation in the alpine cirque has not yet been fully described (Rance 2011).

Three Fiordland endemic species have been recorded in Sinbad valley – the mountain daisy *Celmisia holosericea*, the alpine grass *Chionochloa ovata* and *Dracophyllum fiordense*.

A notable feature of the vegetation in Sinbad valley is the relatively low evidence of deer and possum browse. Deer preferred species such as broadleaf, three finger, lancewood pate, pigeonwood, hen and chicken fern and Prince of Wales fern remain common. Likewise possum palatable species such as tree fuchsia, three finger, pate, wineberry and kamahi are widespread. Beech mistletoes have not been recorded in the Sinbad valley, although this is likely to be a natural phenomenon and not due to animal impacts.

1.2 Fauna

BIRDLIFE

Threatened bird species known to occur in the Sinbad Gully include Fiordland tokoeka/kiwi (*Apteryx australis australis*), möhua/yellowhead (*Mohoua ochrocephala*), whio/blue duck (*Hymenolaimus malachorhynchus*), weka (*Gallirallus australis*), kaka (*Nestor meridionalis*), kea (*Nestor notabilis*), and rock wren (*Xenicus gilviventris*).

The möhua population appears to be at similar levels to other Fiordland valleys where no rat control occurs, and is likely to be declining. Möhua are observed in just a few locations in small groups (1-3) mainly at the head of the valley. South Island robins (*Petroica australis*) appear to be absent within the Sinbad Valley. Both möhua and robins would be ideal candidates to reintroduce back to the Sinbad Gully.

The more common forest birds include brown creeper (*Mohoua novaeseelandiae*), kereru (*Hemiphaga novaeseelandiae*), bellbirds (*Anthornis melanura*), tomtits (*Petroica macrocephala*), falcon (*Falco novaeseelandiae*), yellow crowned kākāriki (*Cyanoramphus auriceps*), and Grey warbler (*Gerygone igata*), are seen throughout the valley.

LIZARDS

The alpine cirque of the Sinbad Valley is a highly significant location due to the reptile assemblage it contains. Three species: the Sinbad skink (*Oligosoma pikitanga*), Cascade gecko (*Mokopirirakau* aff. *granulatus* ‘Cascades’) and cryptic skink (*Oligosoma inconspicuum*) inhabit the same steep rock face habitat in this extreme alpine environment.

The Cascade gecko appears to be sparsely distributed through parts of northern Fiordland (Edmonds, 2009), and is currently listed as At Risk (Hitchmough *et. al.* 2013).

The cryptic skink found in the Sinbad Gully falls within the species *O. inconspicuum* sensu stricto (Patterson, pers. comm. 2010). The Sinbad population is morphologically distinctive, and is tag named the “Mahogany skink” due to its’ unique colouration, however it falls within the *O. inconspicuum* clade. This species is ranked as Declining (Hitchmough *et. al.* 2013). It is

likely that the mahogany morph of the cryptic skink is genetically isolated and under different evolutionary pressures than conspecifics outside of Fiordland and as such

The Sinbad Skink has been recently classified as Nationally Endangered (Hitchmough *et al.* 2013).

A key element of the value of the Sinbad Gully alpine cirque is that three reptile species exist in the same location in sympatry (occupying overlapping habitat and apparently occurring in the same spatial niche). This is the most diverse reptile 'community' of species known from Fiordland's alpine ecosystem and indeed appears to be one of the most speciose alpine lizard communities in the world (Edmonds *et al* 2010).

Prior to 2012 Sinbad Skinks were only known from a very small (~200m²) section of lower rock wall at the head of the Sinbad alpine cirque. In February 2012 two climbing contractors abseiled approximately 180 vertical metres of the cliffs above the area known to contain Sinbad Skinks and saw several lizards including Sinbad Skinks, cryptic skinks, and a Cascade Gecko. Cryptic skinks and Cascade geckos were also seen on the relatively flat ground on top of the wall. In 2013, an adult male Sinbad skink was found approximately 80 metres away from the bottom of the rock wall, extending the known range of this species.

1.3 Threat status

STOATS

Stoats (*Mustela erminea*) are the only pest species currently controlled in the Sinbad Gully. Stoat control during the 2013/14 season consisted of 74 single-set DOC-200 stoat traps at 100m intervals along a seven kilometre line running the length of the main valley. The traps in the Sinbad Gully were first baited and set in January 2010. This regime of trapping is similar to stoat control occurring in other northern Fiordland valleys including the Eglinton, Clinton, Arthur, and Cleddau which has proven to protect whio and kaka (Whitehead *et al* 2006; Dilks *et al* 2003). Other large species still remaining in the area that are likely to benefit from stoat control are weka, falcon, and kea. Fiordland tokoeka (kiwi) may benefit but there is not strong evidence to support this. In the Murchison Mountains a five year study suggested that low intensity landscape level stoat suppression resulted in kiwi population approaching stability but with little evidence of significant recruitment or recovery (Tansell 2009).

POSSUMS

Possoms (*Trichosurus vulpecula*) were liberated in the Sinbad by the Southland Acclimatisation Society in 1890. They are now present at low-to moderate levels through the valley including the alpine cirque.

Low level possum control is periodically undertaken in the Sinbad Gully by private operators for the purpose of commercial fur recovery. This is generally carried out along the valley floor and accessible slopes using a combination of traps and cyanide paste, and is unlikely to provide the scale and ongoing suppression of possum levels required to fully protect vulnerable species.

RODENTS

Rodents are both primary consumers of seeds, invertebrates and in the case of rats, known predators of eggs and chicks (Dilks et al 2003, Whitehead et al 2006). Rodents therefore constitute a direct impact on ecosystem function and biodiversity. In environments where fluctuating food abundance causes rodent population irruptions; rodents play an even more dynamic role as the primary prey of invasive predators such as stoats. The primary driver of ship rat (*Rattus rattus*) and mouse (*Mus musculus*) fluctuations in the Sinbad Gully is expected to be the flowering and seeding of silver beech, the most common forest species in the area.

DEER AND CHAMOIS

Red deer (*Cervus elaphus scoticus*) were thought to have arrived in the Sinbad Gully as recent as the 1980's. Chamois (*Rupicapra rupicapra*) began spreading into Fiordland from the north in the 1970s, and so it is expected they arrived in the Milford area close to this time (King 2005). Both species remain in low numbers in the Sinbad Gully today. Chamois have been observed in the alpine cirque on a number of occasions during field trips. The Sinbad Gully is near the northern limit of the chamois control operational area in Fiordland National Park. No chamois control is undertaken north of Milford Sound or the Milford Road (Loe 2010). There is no red deer control undertaken in the Sinbad gully other than commercial venison recovery across the wider Fiordland area. Deer sign has been observed more commonly in the upper half of the valley in the Sinbad amongst areas of fuchsia and ribbonwood.

1.4 Sinbad Gully Classifications

Sinbad Gully is part of Fiordland National Park. In 1974 Sinbad Gully was set apart as a 'Special Area' because of the presence of kakapo and the largely unmodified state of the vegetation. This status was lifted in 1992 when deer became established in Sinbad Gully and kakapo were thought to be no longer present. It was then considered no longer necessary to restrict public access under the 'Special Area' status. Sinbad Gully is now classified as part of the 'Eastern Remote Zone' under the Fiordland National Park Management Plan (2007).

1.5 Goals and Objectives

CONSERVATION GOALS

- **To enhance the ecological values of Sinbad Gully by reducing stoat and possum numbers to very low levels and maintaining densities at these levels.**
- **To improve our understanding of the abundance and distribution of Sinbad skinks to enable population trends to be monitored and managed to ensure long term survival of the species.**
- **To assess options to reduce numbers of rodents in the gully**
- **To reintroduce threatened species to Sinbad Gully**

OPERATIONAL OBJECTIVES (for July 2013 – June 2014)

- To maintain stoats at a low density using kill-traps
- To undertake monitoring of rodent levels and beech seedfall
- To carry out whoio monitoring via walk-through surveys; one during early duckling rearing and one just prior to juveniles fledging
- To monitor Sinbad skinks to indicate persistence at known locations
- To continue to investigate the wider distribution of Sinbad skinks through methodological surveys of likely locations and following up apparent lizard sightings from climbers.

2.0 Predator control and monitoring

2.1 Stoat control

Stoat control in the Sinbad Valley currently consists of a line of 74 single stainless DOC-200 trap tunnels spaced 100 metres apart (Fig 2). During the 2013/14 season (July 2013 – June 2014) ten trips were made into the Sinbad Sanctuary to check and re-bait the stoat traps (Table 1). Contractors from Stoat and Track Ltd and Mainly Fauna (sub-contractor) were engaged to complete the trap checks as part of a wider trapping programme in the Eglinton-Cleddau-Arthur area. Southern Discoveries staff assisted on approximately half of these trap checks. During each trip the stoat traps were re-baited with a fresh egg, good nature paste and rabbit meat (except for one trip where beef was used). Trap catch was noted and recorded in an Excel spreadsheet (DOCDM-590734).

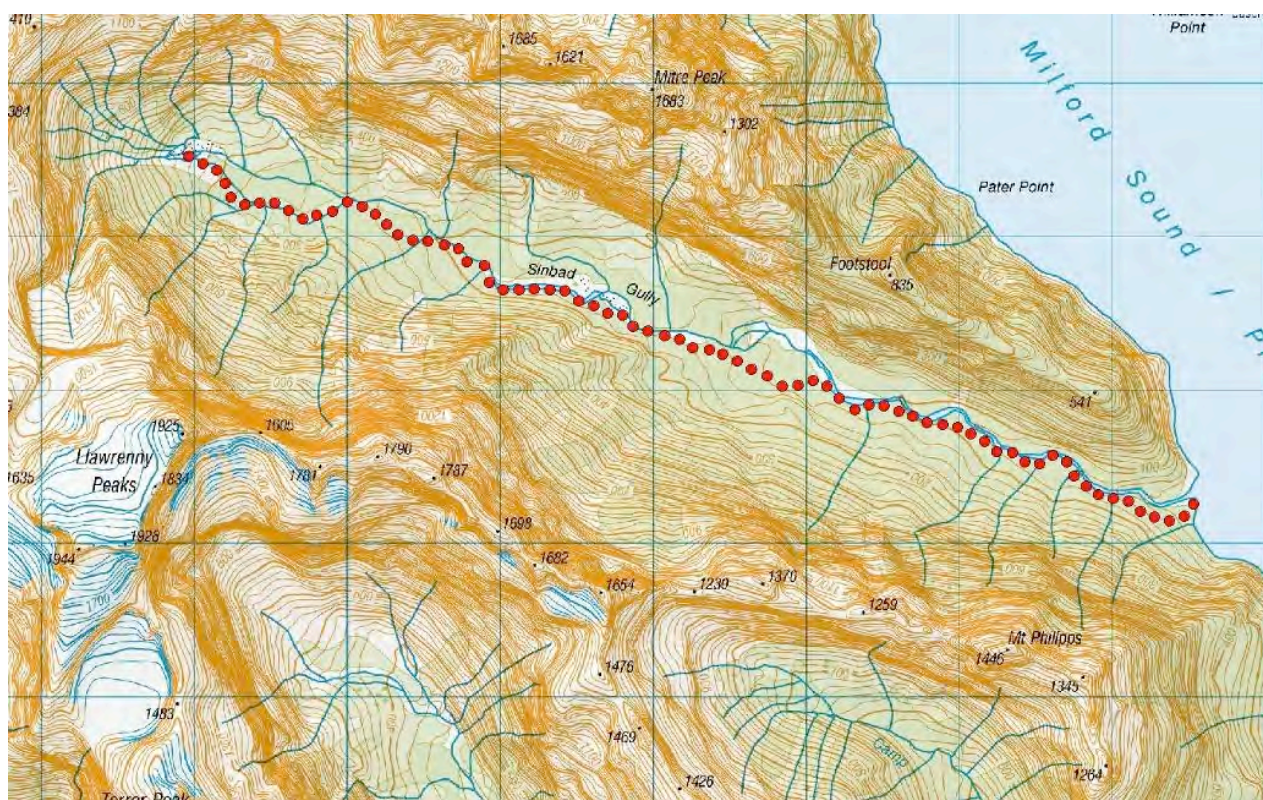


Figure 2- Stoat trap locations, Sinbad Gully.

Ten stoats and 34 rats were caught in the Sinbad Gully during the ten trap-checking trips in the 2013/14 year; similar to numbers caught during the previous year. Nine of the ten stoats were caught during the January and February trap checks and captures were evenly spread along the trap line. This distribution was at variance to that from the previous season where most stoats were captured in the lower valley. Rat captures were evenly spread through the length of the valley

Table 1- Stoat trap check trips in Sinbad Valley in 2013/14

Check	Date	Bait used	Staff	Affiliation
1	11/07/2013	Egg & beef	Iris & Paul Stephens	Mainly Fauna & SD
2	21/08/2013	Egg & rabbit meat or GN paste	Ana Richards & Daniel	Stoat and Track Ltd & SD
3	29/09/2013	Egg & rabbit meat or GN paste	Iris Broekema & 2 volunteers	Mainly Fauna & SD
4	8/11/2013	Egg & rabbit meat or GN paste	John Carter & James & Lorina	Mainly Fauna & SD
5	10/12/2013	Egg & rabbit meat or GN paste	Fay Edwards & Louis & Charlie	Mainly Fauna & SD
6	16/01/2014	Egg & rabbit meat or GN paste	Bev Thorne	Mainly Fauna
7	20/02/2014	Egg & rabbit meat or GN paste	Iris Broekema & PC Taylor	Mainly Fauna
8	15/03/2014	Egg & rabbit meat or GN paste	Bex Jackson	Mainly Fauna
9	13/04/2014	Egg & rabbit meat or GN paste	Bev Thorne	Mainly Fauna
10	8/05/2014	Egg & rabbit meat or GN paste	Neville Thorne	Mainly Fauna

Table 2- Stoat trap results 2013/14

Date	Stoat	Rat	Sprung
11/07/2013	0	5	0
21/08/2013	0	10	0
29/09/2013	0	2	1
8/11/2013	0	1	2
10/12/2013	0	1	0
16/01/2014	5	3	1
20/02/2014	4	0	4
15/03/2014	1	4	1
13/04/2014	0	2	1
8/05/2014	0	6	2
TOTAL	10	34	12

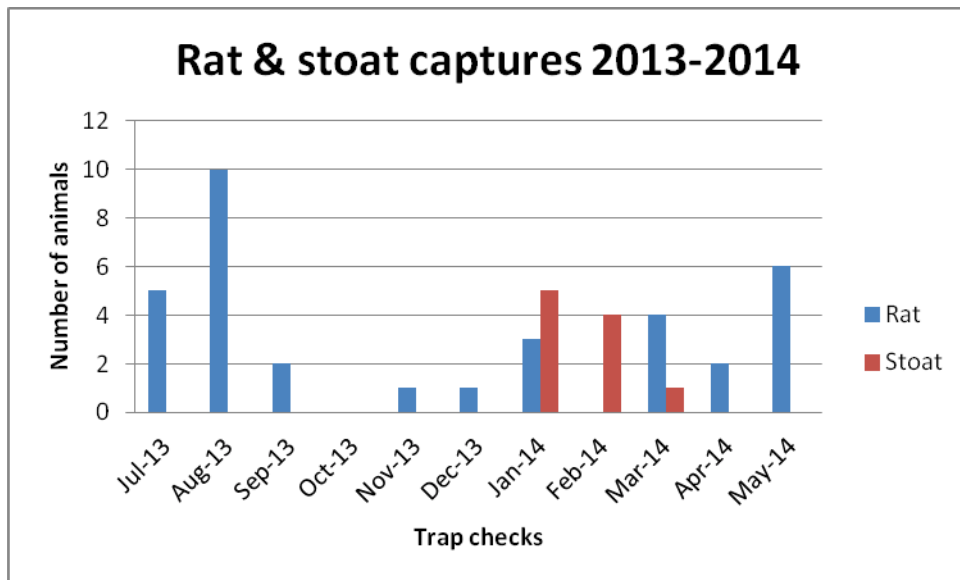


Figure 3. Rat and stoat captures during the past financial year, July 2013 to June 2014

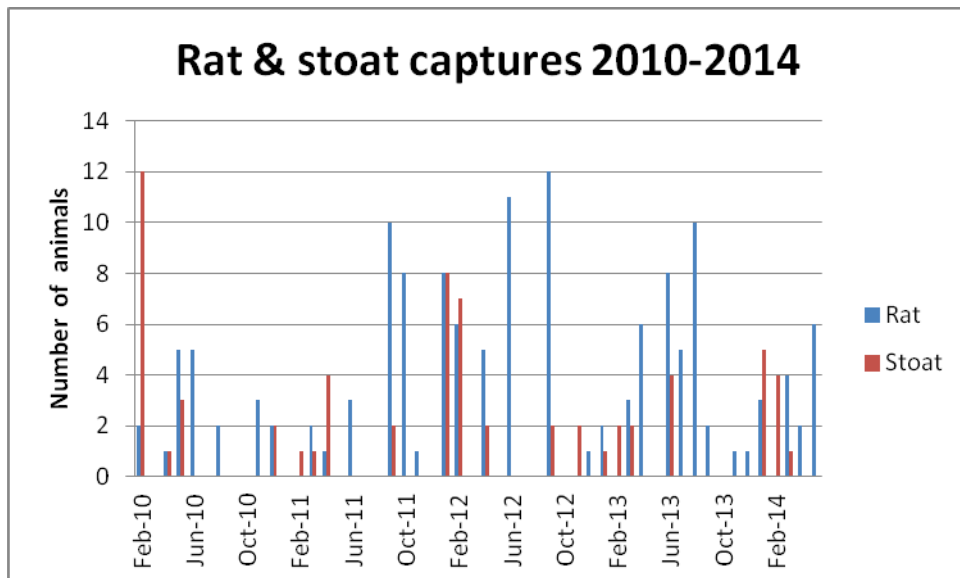


Figure 4 -Trap results since trapping began in 2010

Bait trial

The Sinbad Gully trap line was used as part of a wider stoat bait trial this year. Each trap tunnel was either baited with an egg plus a piece of fresh rabbit meat or an egg plus a ball of rabbit meat paste bait developed by Goodnature Ltd. The two different bait types were placed into alternating trap tunnels each time the line was serviced between August 2013 and May 2014. The Goodnature paste has the advantage that it can be stored without needing chilling or freezing, and contains preservatives that may increase its field life and longer term attractiveness. The aim of the trial is to assess whether traps baited with the new paste bait in conjunction with an egg catch at least as many, or more stoats than fresh rabbit meat and an egg.

Table 3- Trap results for paste trial, Sinbad Gully 2013/14

SINBAD TRAPS ONLY (74 tunnels)	Goodnature paste + egg	Rabbit meat + egg	Total
Stoat	7	6	13
Rat	21	10	31
Sprung	7	4	11

Table 4- Trap results for paste trial. All trial sites 2013/14 (includes parts of Eglinton & Cleddau)

ALL TRIALTRAPS (332 tunnels)	Goodnature paste + egg	Rabbit meat + egg	Total
Stoat	46	40	86
Rat	134	86	220
Weasel	2	6	8
Sprung	60	47	107

*All trial data up to July 2014.

Although this is just the first months of a two year trial, the preliminary results are looking promising. Trap capture rates indicate that the Goodnature paste is likely to catch stoats at least as well as the traditional bait used. Rat captures seem to favour the new paste. This trial will continue for another year, using a modified paste recipe.

New pest control technology (including self-resetting traps and multi-kill toxin delivery tunnels) continue to be trialled but are not yet ready for widespread use. If proven to be effective, these new style tools that can deliver several pest kills before needing to be serviced could have direct benefit if applied in valleys such as the Sinbad. These new tools are likely to be of most benefit when used in addition to current tools where remoteness, cost, and terrain make them an effective option (i.e. the true left side of the river).

2.2 Rodent monitoring

In December 2010 ten tracking tunnel lines were established, each with ten tunnels covering the forested length of the valley. The lines range in altitude from 60 to 340 m metres a.s.l. The standard operating protocol to monitor rodents was used (Gillies & Williams 2005). The lines are marked with flagging tape but not cut and tunnel locations are marked with white triangles (Figure 5). Tracking tunnel results and grid references for individual tunnel locations are stored in DOCDM-643024. The rodent monitoring lines were run in November 2013, February 2014, and May 2014 (Refer Table 5 below).

Rodent tracking rates increased gradually through the year, but given the low level of seed are expected to level off through winter and spring.

Table 5 - Rodent Monitoring results for 2013/2014

	Rat tracking	Mouse tracking
Nov-2013	4%	4%
Feb-2014	9%	5%
May-2014	14%	16%

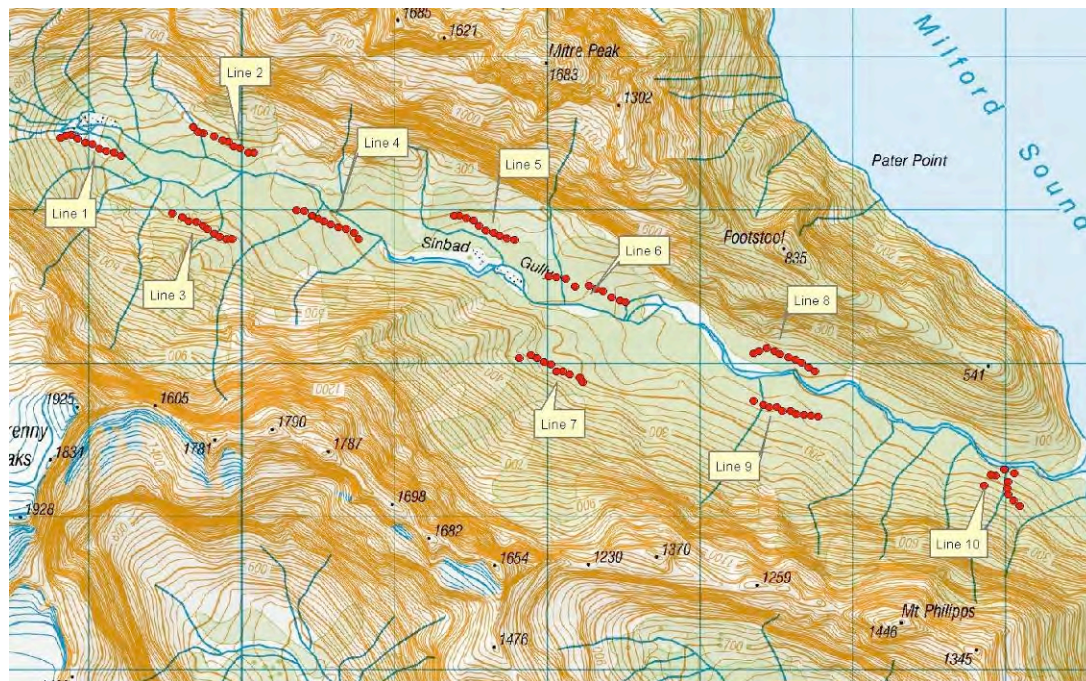


Figure 5- Location of the ten tracking tunnel lines in the Sinbad Gully.

2.3 Beech Seed Monitoring

A comparatively low cost method of predicting trends in future rodent abundance is the collection of beech seed in funnels set up in the forest. The amount of seed collected provides a prediction of future rat and mouse numbers which fluctuate in response to food availability, generally beech seed. Periods of high rat numbers are a threat to a variety of native species, and substantial decreases in bat, mohua, and other small forest bird populations have been recorded following previous rat irruptions (e.g. 1999-2001, and 2006-07) in monitored sites like the Eglinton Valley (Pryde et al 2005; Dilks et al 2003). Eight seedfall trays were set up in the Sinbad Gully in December 2010 and 2014 was the fourth year of seed fall monitoring. Each tray consisted of a plastic funnel suspended above the ground by three metal stakes with a stocking attached to the bottom of the funnel to collect the seeds each autumn. Seedfall trays were established in pairs 50m apart and 50m from the nearest large forest edge along the stoat trap line. The stockings were set up to start collecting on 20th February 2014. Seeds from the trays were collected on 11th May 2014, stockings replaced and seed fall collected again between 7th and 9th July 2014. The seed counting and analysis was contracted to the School of Biological Sciences at the University of Canterbury, and full results are stored in DOCDM-45754 which holds all Fiordland District seedfall data.

Seed-fall was low during the first period (February to May) with the number of viable seeds very low. Between May and July seed-fall was even lower and viable seed almost nil. All seed

collected was from silver beech. Seed fall density is usually reported as the number of seed per square metre. The Sinbad site recorded an average of 276 seeds per m² for 2014 (Table 6), considered a low amount. The result contrasts sharply with the 2011 year when an average silver beech seed density of 3446 per m² was recorded in the same trays (Fig 6).

Table 6 - Beech seed monitoring results for the Sinbad Gully, 2014.

Tray ID	Started	Finished	Seed Count	Viable	Non-viable	Seeds per m ²
S 1	20/2/2014	11/5/2014	1	0	1	
S 2	20/2/2014	11/5/2014	11	0	11	
S 3	20/2/2014	11/5/2014	41	5	36	
S 4	20/2/2014	11/5/2014	21	0	21	
S 5	20/2/2014	11/5/2014	416	11	39	
S 6	20/2/2014	11/5/2014	61	1	49	
S 7	20/2/2014	11/5/2014	37	5	32	
S 8	20/2/2014	11/5/2014	2	0	2	
S1	11/5/2014	7/5/2014	0	0	0	
S2	11/5/2014	9/5/2014	5	0	5	
S3	11/5/2014	9/5/2014	3	0	3	
S4	11/5/2014	9/5/2014	4	0	4	
S5	11/5/2014	9/5/2014	6	0	5	
S6	11/5/2014	7/5/2014	4	0	4	
S7	11/5/2014	7/5/2014	6	1	5	
S8	11/5/2014	9/5/2014	0	0	0	
Total			618	23	217	276

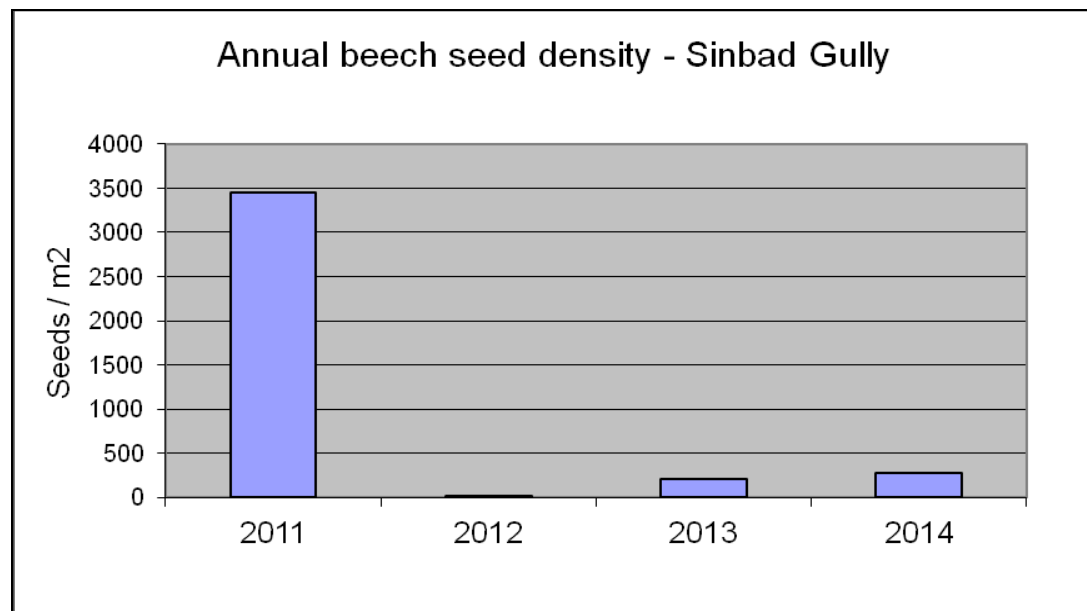


Figure 6 - Beech seed density in Sinbad Gully 2011-2014.

3.0 Outcome monitoring

3.1 Lizard monitoring in the alpine cirque

Methods

Lizard monitoring was completed during two days of fine weather in early March by a team of four – James Reardon, Hannah Edmonds, Em Oyston and Otago University Postgraduate in Wildlife Management student Luke Johnston. The team completed annual occupancy and minimum numbers monitoring of the Sinbad skinks. This technique uses several observers to sit at one site on the rock wall and record number of skinks observed, number of sunshine minutes, rock temperature, rock and air temperature, relative humidity, wind speed and barometric pressure from a Kestrel weather meter at a repeated frequency.

Luke trialled and evaluated the use of Kinopta Blackeye 2Wcameras for monitoring Sinbad skinks, and analysed the correlation of different environmental variables with Sinbad skink emergence from the data we have collected since 2012.

Luke set up two cameras at two sites: the first site was in a small rock pile where the Sinbad skink had been observed the previous season. The second site was focused on the section of the north facing cliff face in Sinbad Gully where the annual monitoring takes place. Both cameras were set up on tripods and frames of view positioned using laptop computers to obtain the desired shot. Cameras were set up at ~10:30am on the morning of day 1 and were left running continuously in “normal” mode at 2fps until approximately 4pm on day 2. Camera footage from both locations was then reviewed in office using the Kinopta software. If a skink was sighted then the time when the skink first appears in view and the time when it leaves view was recorded.

Results

A total of 45 x 15 minute observations were done over the two days. A total of three skinks were seen.

The best model of the correlation of different environmental variables with Sinbad skink emergence identifies the highest proportion of Sinbad skinks at Sinbad Gully will be observed when rock temperature is about 18.4 °c; relative humidity is about 66%; and wind speed is 3.8m/s.

No skinks were captured on either day by camera 1 at the lower rock pile site. Camera 2 did not capture any skink sightings on day 1. On day 2, there were several skink sightings however, only one could be identified with certainty to be a Sinbad skink. The other skink sightings appear likely to be cryptic skinks. No pests were captured in any camera footage.

Conclusions and discussion

One less skink was seen this year, than in 2012. This suggests that the population has not suffered a dramatic decline at least in the area surveyed.

No meaningful comparisons of human observer versus camera traps could be made nor could any detection probabilities be calculated because cameratrap capture frequencies were too low. Luke concluded Kinopta Blackeye 2 W cameras are not a viable option for alpine skink monitoring but that advances in resolution and polygon selectability may improve the tool in the future. Monitoring alpine skinks with camera traps remains a potentially valuable tool for alpine skink monitoring and further investigation is justified (Johnston 2014). Until such developments are made we will continue to use the existing manual method to verify the status of the population.

Luke investigated the use of photo-identification for Barrier skinks and found it to be capable of accurately identifying individuals from photographs taken in the wild. He recommends assessing the viability of photo-identification for Sinbad skinks determining whether there are sufficient distinguishing features and variation of patterning between individuals, and that there is long-term pattern stability. We already have a photographic database of 14 individuals from early work in the Sinbad, thus this method could be tested by future student placements but would require an extended period of field work in the alpine cirque.

3.2 Whio (Blue Duck) monitoring

RESULTS

Two river surveys were completed during the 2013/14 season along the Sinbad River. A contractor Paul Van Klink with his conservation species dog Hoki was accompanied by Southern Discoveries staff on 20th of December 2013. Two unbanded pairs were found (Upper Sinbad and Sinbad Flats) in the upper half of the valley, one of these pairs (Upper Sinbad) had 3 ducklings, with another 2 single birds found further downstream.

A second river survey was performed by Andy Glaser and his dog Neo with Southern Discoveries staff on the 31st of January 2014. Two unbanded pairs (Upper Sinbad and Sinbad Flats) were found in the upper half of the valley, one of these pairs (Upper Sinbad) had 3 fledglings, with another 4 single birds were located further downstream. Two of these single whio included a single male found in the middle of the valley with a single female located close by hiding in a roost in moult, it is thought that it is likely that these birds are a pair (Footstool).

The 2013/14 season saw positive results for whio with a total of 8 adults found, of which it is thought that there were 3 pairs and 2 singles, with one pair successfully raising 3 ducklings to fledging (refer to Figure 7 below, pairs are red points, single birds are blue).

Figure 7 – Who recorded in Sinbad Gully during 2013/14

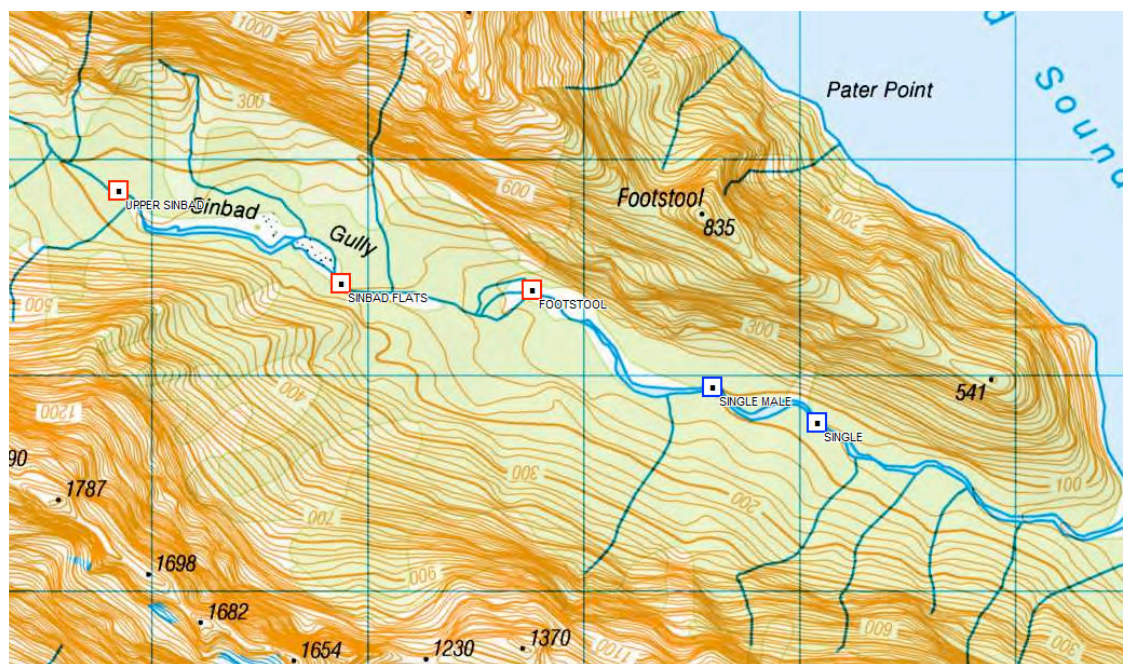


Table 7 – Summary of who sightings in the Sinbad Gully 2005-2014

Season	Surveyed river (km)	Pairs known	Ducklings seen	Juveniles seen	Singles seen
2005/2006	4	3	0	3	0
2006/2007	5	2	0	0	2
2007/2008	7	2	0	1	2
2008/2009	7	2	0	0	2
2009/2010	7	3	0	1	3
2010/2011	7	2	3	0	1
2011/2012	7	3	0	0	1
2012/2013	7	1	0	0	2
2013/2014	7	3	3	3	2

3.3 Other wildlife sightings

Möhua were heard calling in the upper part of the valley in during the 2012/13 season, however they were in very low numbers, often a single bird calling. Weka appear to be in moderate numbers throughout the valley and in good numbers in the Sinbad head basin. Small forest birds such as bellbird, tui, fantail, and brown creeper appear to be present in good numbers (I. Broekema *pers comm.*)

No robins were seen or heard in the valley again this season, confirming that they are most likely absent from the valley. Kaka, falcon, and kea were all recorded when the tracking tunnel lines were monitored in June.

In the alpine cirque it was noted that whilst searching for skinks and disturbing some rocks that significantly fewer yellow headed slugs (*Amphikonophora giganteus*) and weta were observed. The cirque is the type locality for *Hemiandrus nitaweta* and a location for *H. superba*, seldom seem large weta, and we have continued concerns regarding the mouse impact on these large and presumably vulnerable invertebrates. Also spotted was a peripatus, of the genus *Ooperipatellus* (probably *viridimaculatus* or closely related undescribed species). Thus we should recognise the alpine cirque as a site of significant invertebrate as well as herpetological values.

4.0 Planned and Actual Budget

	Planned	Actual	Notes
Stoat trap servicing			
Contractors/Wages	\$3,000	\$5,077	
Helicopter	\$5,000	\$5,175	
Additional buffer traps	\$700	\$0	
TOTAL	\$8,700	\$10,252	10 checks
Tracking tunnel monitoring			
Contractors/Wages	\$2,000	\$2,000	
Helicopter	\$1,600	\$1,600	
Field equipment	\$200	\$300	
TOTAL	\$3,800	\$3,900	2 checks
Lizard monitoring			
			No contractor used this year.
Contractors/Wages	\$2,000	\$0	
Helicopter	\$2,000	\$1,300	
Groceries	\$300	\$180	
Field equipment	\$200	\$300	
TOTAL	\$4,500	\$1,780	
Project management	\$6,000	\$6,000	Management, reporting, overheads, etc
Operating Total	\$23,000	\$21,932	
Possum control			
Annual cost averaged over 5 years	\$5,525	\$6,781	
Contribution to possum/rat control funds held by FCT			
Donation from Southern Discoveries to FCT	\$28,525	\$28,525	
Transfer from FCT to DOC	\$23,000	\$23,188	

5.0 Operational Objectives for 2014/15

5.1 Predator control and monitoring

Stoat control

- Carryout at least eight stoat trap checks throughout the year using professional pest control contractors to ensure regular servicing occurs.
- Establish an additional stoat trap line on the true left of the river. This will first need to be costed and seen if it can be achieved within the budget.
- Cost out and establish a predator control regime in the cirque area.

Possum and rat control

- The Sinbad Gully is now integrated in the Arthur BMU (Biological Management Unit). Rat and possum control will be achieved through the application of aerially applied 1080 cereal bait, timed to coincide with years when rodent irruptions happen in response to beech seeding. This approach will be used across the whole BMU, which the Sinbad makes up approximately 20% of the total Arthur BMU. Funding for this mast response pest control comes through the centralised Battle for our Birds fund.

Rodent monitoring in the forest and associated beech seed monitoring

- Carryout tracking tunnel monitoring four times per year
- Collect beech seed-fall in autumn, analysis funded by DOC

Feasibility study and management plan for alpine cirque fauna

- Investigate appropriate rodenticides and disposable bait stations
- Develop rodent monitoring plan to validate effort
- Design investigation of non-target impacts
- Consider the options for *ex-situ* evaluation of Sinbad skink alpine specialization in collaboration with Auckland Zoo.

5.2 Monitoring of Outcome Species

Whio monitoring

- Carryout two whio river surveys; one in Nov/Dec and one in Jan/Feb weather permitting (funded by DOC), plus casual observations while conducting other work

Lizard monitoring

- Repeat monitoring method for catastrophic change

- Survey new sites for Sinbad skinks if new sightings are reported (funded by DOC)

Kiwi monitoring

- Repeat the 5-yearly kiwi survey that was established in 2011 again in 2016.

5.3 Advocacy opportunities

Southern Discoveries would like to see their staff more involved in and committed to the project, as well as opportunities for their clients to benefit from their investment in the project. Potential opportunities for improving Southern Discoveries return on investment were discussed at a meeting between Southern Discoveries, Fiordland Conservation Trust and Department of Conservation in July 2014. Ideas discussed included:

- Meet with Toni Ellis from DOC to investigate the possibility of installing the Sinbad project on the app for the Milford Road, along with a profile for Southern Discoveries and Fiordland Conservation Trust.
- Southern Discoveries staff to be offered more opportunities to accompany DOC staff working in Sinbad Gully eg stoat trapping trips, tracking tunnel monitoring, collecting beech seed from seed-fall trays, who river surveys, bird surveys (eg weka, kiwi or mohua)
- Max to investigate opportunity for National Film Unit student, Braydon, to produce 5-10 minute video clip suitable for use on websites or tourist accommodation or boats at Milford. James Reardon to assemble a component on the alpine biodiversity and management options.
- Max to investigate option of setting up a camera in the Sinbad valley and live streaming back to a Southern Discoveries venue
- Investigate a media opportunity for the February lizard trip

6.0 Management of Sinbad Sanctuary 2014/15

Sponsorship:

The Southern Discoveries 5 year sponsorship agreement ended in July 2014. The company have indicated intent to continue to provide financial assistance on an annual basis.

Management Team:

The management team will meet twice a year and will be represented by the Fiordland Conservation Trust (Laura Harry), Southern Discoveries (John Robson) and Department of Conservation (Max Smart).

6.1 Planned Budget for 2014/15

	Planned	Notes
Stoat trap servicing		
Contractors/Wages	\$5,000	
Helicopter	\$4,500	
TOTAL	\$9,500	10 checks
Tracking tunnel monitoring		
Contractors/Wages	\$3,000	
Helicopter	\$1,500	
Field equipment	\$600	
TOTAL	\$5,100	4 checks
Lizard monitoring		
Contractors/Wages	\$2,000	
Helicopter	\$1,800	
Field supplies	\$1,140	
TOTAL	\$4,940	
Project management	\$6,000	Management, reporting, overheads, etc
Operating Total	\$25,540	
Donation from Southern Discoveries to FCT	\$28,525	
Transfer from FCT to DOC	\$25,540	

7.0 Acknowledgements

Southern Discoveries have again provided substantial financial assistance, without which the Sinbad Sanctuary project would not be in place today. This project is managed in partnership with the Fiordland Conservation Trust, who has provided support and the links between the Department of Conservation and Southern Discoveries teams in order to achieve the common goal of restoring and monitoring the ecosystem in the Sinbad Gully. Thanks in particular to John Robson from Southern Discoveries, Rachel Cockburn and Laura Harry from the Fiordland Conservation Trust, Gerard Hill and Andrew Smart from Department of Conservation.

Many people have assisted with work on the ground in the Sinbad over the last year. Thank you to the team from Stoat and Track Ltd and Mainly Fauna who completed the stoat trap checks and rodent monitoring this year, assisted by volunteers from Southern Discoveries and the Blue Duck Café.

Thank-you to Luke Johnston for his valuable work on Sinbad skink monitoring tools.

Thanks to Jeff Shanks and Snow Mullally from Milford Helicopters who provided transport into the area.

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Appendix 1 - Stoat trap captures per trap site Feb 2010 – June 2014

Tunnel_number	Rat	Sprung	Stoat	Mouse	Weasel	Bird
S001	2					
S002	2		1			
S003	1	1				
S004	4	1	2	1		
S005	1	3	2			
S006	2	1	1			
S007	1		1			
S008	1					
S009	1		1			
S010	1					
S011	2					
S012	4					
S013	1	1	1			
S014	2	1	2			
S015	4		1			
S016	2		1			
S017	2	3	1			
S018	1		2			1
S019	1	1	1			
S020	6					
S021	4	1				
S022		1			1	
S023	3					
S024	3	2				1
S025	2		1			
S026	1					
S027	2		1	1		
S028		1				
S029	3		1			
S031			1			
S032	3					
S033	6					
S034	3	1	1			
S035	1	3		1		
S036		1				
S037	1	1				
S038			1			
S039	3		1			
S041	1	2				
S042	5		1			
S043	2					
S044	1		2			1
S045	4		2			
S046	2					
S047	2	1		1		
S048	3		2			
S049	1		2			
S050	1	1	1			1

S051	2					
S052			1			
S053	2					
S054	3	1				
S055			2			
S056		1	2			
S057		1	2			
S058			2			
S059	3		1			
S060	1		2			
S061				1		
S062	5	1		1		
S063	1	1	1			
S064		1	2			
S065	6		1	1		
S066			2			
S067	4			1		
S068	1	3	2			
S069	5		4			
S070	4		1	1		
S071	2	1	3			
S072	4	3	1	1		
S073			3			
S074	11		2			
S075	1					
Grand Total	153	40	68	10	1	4