



# The Sinbad Sanctuary Project

Sinbad Gully, Milford Sound  
2012/13 Annual Report



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Department of Conservation  
*Te Papa Atawhai*



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Department of Conservation  
Te Anau Area  
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*Cover image- Cascade Gecko in Sinbad cirque. James Reardon/DOC*

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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 fourth year of restoration in the Sinbad Sanctuary Project in northern Fiordland National Park. The 2012/13 year saw a continuation of the stoat trapping, beech seed monitoring, and lizard monitoring established in the initial year of the project. Southern Discoveries has continued to provide the primary financial support which has made the project possible.

A low amount of silver beech seed was recorded during autumn 2012 in the Sinbad Gully, and rodent and mustelid levels were predicted to remain low this season in response. Beech seedfall monitoring was repeated during autumn 2013, and a low level of seeding was found again, suggesting that predator numbers will remain low heading into the 2013/14 season.

During the 2012/13 year a total of eight stoat trap checks were carried out recovering a total of 13 stoats, 32 rats, and one mouse. Stoat numbers were low through the year, with all but one stoat caught in the lower third of the valley. A moderate number of rats collected during the first check of the season were evidence of some beech seeding from the previous year, and then rat captures declined for the remainder of the 2012/13 season.

Monitoring of alpine skinks continued during summer 2013 with a team based in the Sinbad head basin. Experienced monitoring staff surveyed known skink habitat at the base of the head basin walls.

A new lizard monitoring method was repeated for a second year this season that involves recording the numbers of individuals observed from identified viewing points over set timeframes. The decision to move to this simple monitoring method is driven by the resources necessary to adequately complete a more thorough study of their population biology using conventional capture-recapture methodologies. The area of known habitat was searched over two days in late February 2013 and similar results as the previous year were recorded. In addition, a single adult male Sinbad skink was found approximately 80 metres away from the bottom of the rock wall, extending the known range of this species.

# 1.0 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 great attribute 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 to protect the endangered species that still survive in the valley today, and possibly future reintroductions for species that are no longer present in the valley.



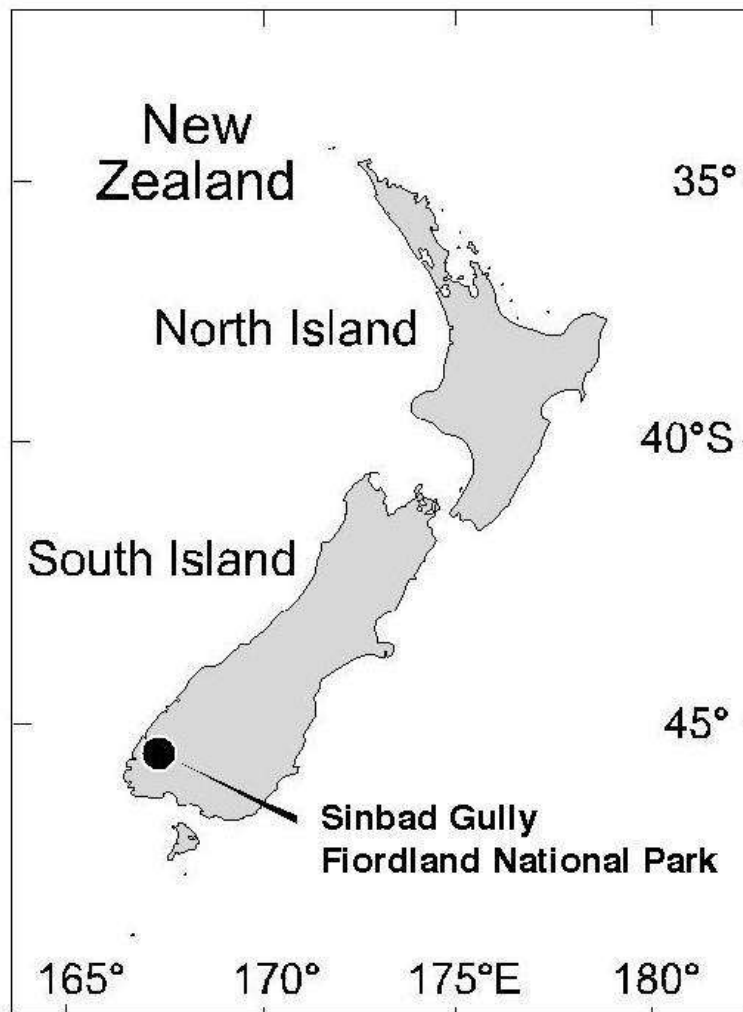


Figure 1- Location of Sinbad Gully in the southwest of New Zealand

## 1.1 Flora

The predominant vegetation within the valley is silver beech-southern rata forest. Within the lower valley pure silver beech (*Nothofagus menziesii*) on the valley floor gives way to southern rata (*Metrosideros umbellata*) on the steep side-walls and at higher elevation. Hall's totara (*Podocarpus hallii*) is prevalent in these areas also. Further up the valley silver beech remains prevalent and mountain beech is encountered only on valley walls. Scattered rimu (*Dacrydium cupressinum*) occur as emergent trees on northern aspect slopes in the mid-valley. A few miro (*Prumnopitys ferruginea*) are also present in the valley.

Sub-canopy trees include kamahi (*Weinmannia racemosa*), lancewood (*Pseudopanax crassifolius*), threefinger (*Raukaua simplex*), fivefinger (*P. arboreus*) and broadleaf (*Griselinia littoralis*) and mahoe (*Melicactus ramiflorus*). The shrub layer features peppertree (*Pseudowintera colorata*), tree fern (*Cyathea smithii*), *Neomyrtus pedunculatus* and a number of coprosma species; *Coprosma rhamnoides*, *C. foetidissima*, *C. parviflora* and *C. colensoi*. Shield fern (*Polystichum vestitum*), hen and chicken fern (*Asplenium bulbiferum*) and crown fern (*Blechnum discolor*) frequently forms a dense lower tier within the forest while the Prince of Wales (*Leptopteris superba*) is mainly found on shadier and damper slopes.

In the upper valley, there are some large areas of shrubland. Seral species predominate especially fuchsia (*Fuchsia excorticata*), wineberry (*Aristotelia serrata*), and mountain ribbonwood (*Hoheria glabrata*) and these form a low shrubby forest of about 4-6m in height.

The alpine cirque is dominated by *Chionocloa rigida* with dispersed *C. crassiuscula* and patches of shrubs and large loose rock jumbles. The vegetation in the alpine cirque has not yet been fully described (Rance 2011).

## 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 happens, 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 very 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).

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 only 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 (~200m<sup>2</sup>) 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.

## 1.3 Threat status

### STOATS

Stoats (*Mustela erminea*) are the only pest species currently managed in the Sinbad Gully. Stoat control during the 2012/13 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-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, White *et al* 2006). As such rodents constitute a direct impact on ecosystem function and biodiversity. In environments where fluctuating food abundance allow rodent population irruptions they 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 1980s and 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, as no chamois control is undertaken north of Milford Sound or the Milford Road (Loe 2010). Deer remain in low numbers in the Sinbad Gully and no deer control currently takes place 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 Classification

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 at the time and the largely unmodified state of the vegetation. This status was lifted in 1992 when deer had become established in Sinbad Gully and kakapo were thought to be no longer present, therefore it was 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.
- 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.
- Assess options to reduce numbers of rodents in the gully
- To reintroduce threatened species to Sinbad Gully

## **OPERATIONAL OBJECTIVES (for July 2012 – June 2013)**

- Maintain stoats at a low density using kill-traps
- Undertake monitoring of rodent levels and beech seedfall
- Carry out whoio monitoring via walkthrough surveys; one during nesting and one post nesting
- Monitor Sinbad skinks to indicate persistence at known locations
- Continue to investigate wider distribution of Sinbad skinks through methodological surveys of likely locations and following up apparent lizard sighting 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 2012/13 season (July 2012 – June 2013) eight trips were made into the Sinbad Sanctuary to check and re-bait the stoat traps (Table 1). In previous seasons Southern Discoveries staff have assisted DOC staff on approximately half of the trapping trips, however this year contractors were employed to service traps to ensure checks were made consistently on schedule. Contractors from Stoat and Track Ltd and Mainly Fauna (subcontractor) were engaged to complete the trap checks as part of a wider trapping programme in the Eglinton-Cleddau-Arthur area. During each trip the stoat traps were re-baited with a fresh egg and either beef or rabbit meat. Trap catch was noted and recorded in an Excel spreadsheet (DOCDM-590734).

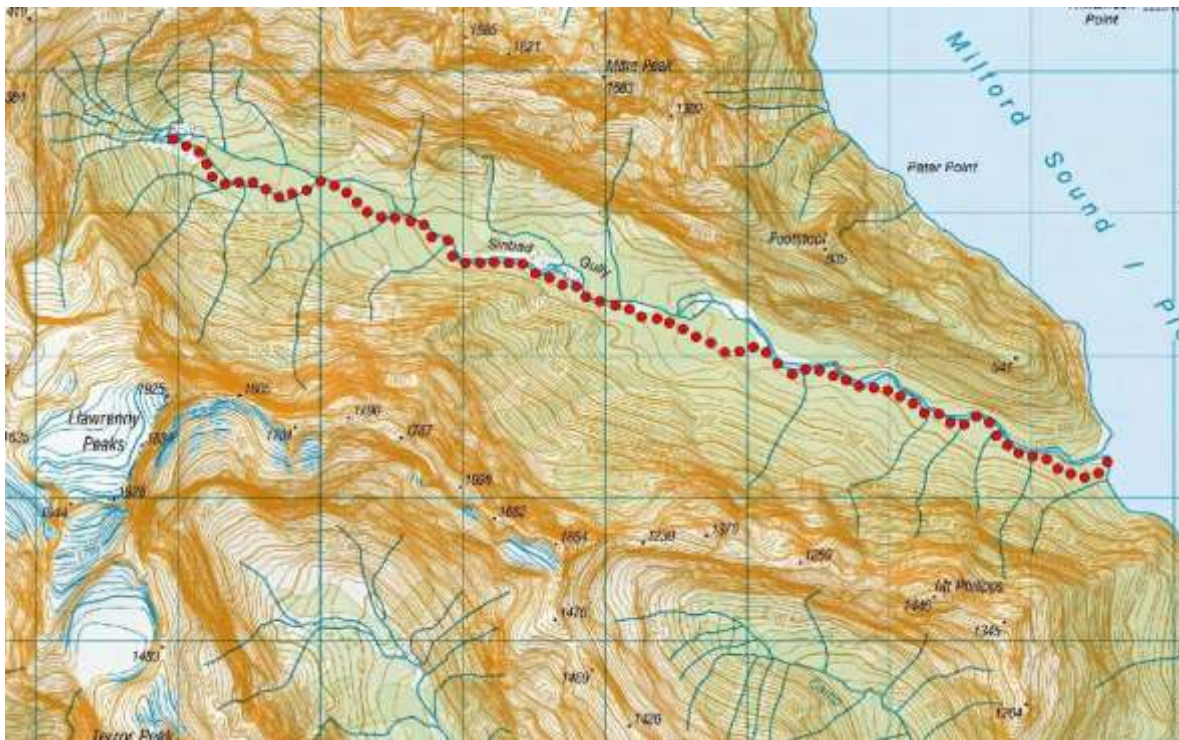


Figure 2- Stoat trap locations, Sinbad Gully.



Table 1- Stoat trap check trips into Sinbad Valley in 2012/13

<u>Check</u>	<u>Date</u>	<u>Bait used</u>	<u>Staff</u>	<u>Affiliation</u>
1	28/09/2012	Egg & fresh rabbit	Anna Richards	Stoat and Track Ltd
2	5/11/2012	Egg & fresh beef	Anna Richards	Stoat and Track Ltd
3	9/12/2012	Egg & fresh beef	Iris Broekema & Nick	Mainly Fauna & MSL
4	25/01/2013	Egg & fresh venison	Iris Broekema & PC Taylor	Mainly Fauna
5	8/02/2013	Egg & fresh venison	Iris Broekema & Emma Williams	Mainly Fauna
6	17/03/2013	Egg & fresh venison	Anna Richards	Stoat and Track Ltd
7	20/04/2013	Egg & fresh beef	Iris Broekema	Mainly Fauna
8	18/06/2013	Egg & fresh beef	Iris Broekema & PC Taylor	Mainly Fauna

Table 2- Stoat trap results 2012/13

<u>Date</u>	<u>Stoat</u>	<u>Rat</u>	<u>Mouse</u>	<u>Sprung</u>
28/09/2012	2	12	-	5
5/11/2012	2	-	-	1
9/12/2012	-	1	1	-
25/01/2013	1	2	-	-
8/02/2013	2	-	-	-
17/03/2013	2	3	-	-
20/04/2013	-	6	-	-
18/06/2013	4	8	-	2
<b>TOTAL</b>	<b>13</b>	<b>32</b>	<b>1</b>	<b>8</b>

Thirteen stoats and 32 rats were caught in the Sinbad Gully during the eight trap-checking trips in the 2012/13 year, approximately 2/3 of what was caught the previous year. Almost all stoats were trapped in the lower part of the valley, with all but one caught in the lower third of the trap line. This possibly suggests that a degree of invasion of dispersing stoats from the wider area was happening as is common elsewhere during summer months. Rat captures were more evenly spread through the length of the valley.

Trials and development of improved pest control technology is currently underway, including self-resetting traps and multi-kill toxin delivery tunnels. 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. Although unlikely to completely replace existing methods in the short term, these new tools being developed

and tested are likely to be of most benefit when deployed in addition to current tools in areas where remoteness, cost, and terrain make them an effective option (i.e. the true left side of the river).

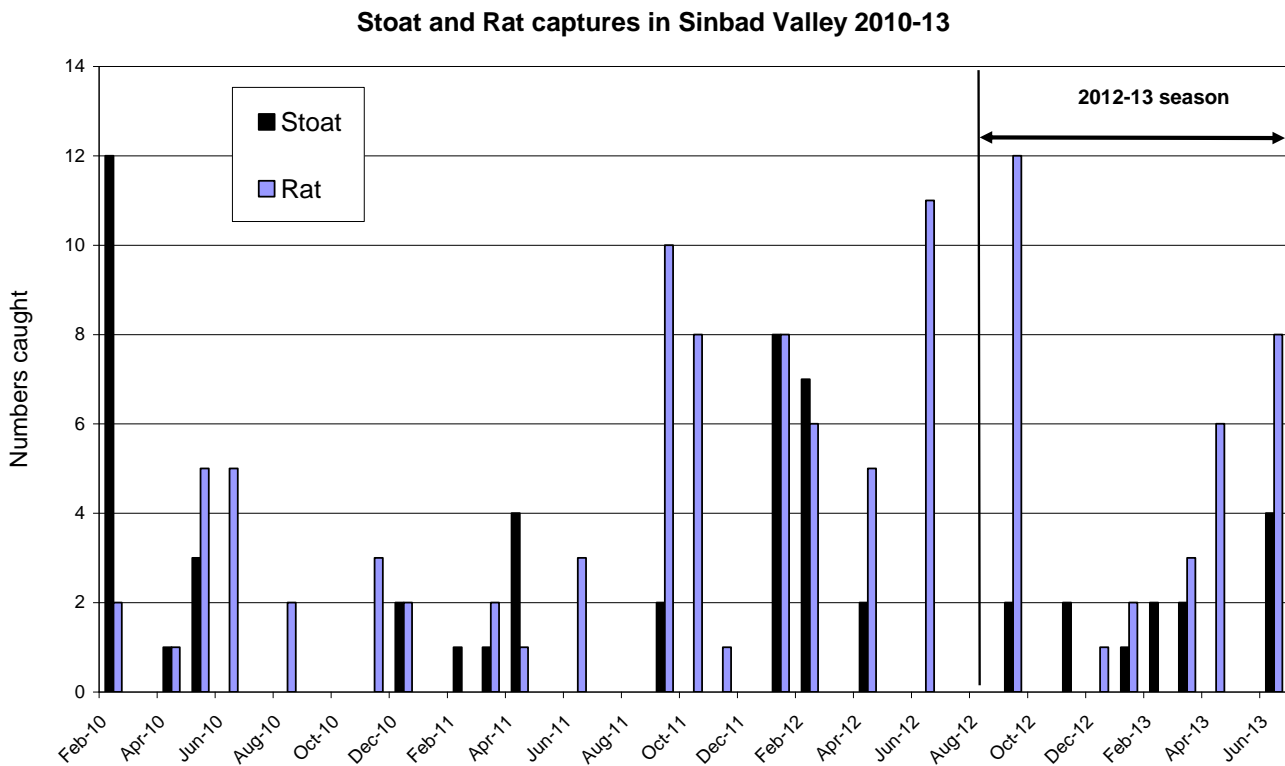


Figure 3 – Stoat trap results since trapping began.

## 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; tunnel locations are marked with white triangles (Figure 4). Tracking tunnel results and grid references for individual tunnel locations are stored in DOC DM-643024. The rodent monitoring lines were planned to be run in May 2013, however this was delayed until June due to the Milford Road being closed for almost a month for maintenance at the Homer Tunnel. The tracking tunnels were run 18-19<sup>th</sup> June 2013 and 10% of tunnels tracked a rat and 8% mice.





Figure 4- Location of the ten tracking tunnel lines in the Sinbad Gully.

## 2.3 Beech Seed Monitoring

By collecting seeds in trays set through the forest and counting the number and species of seeds present it helps to predict future rodent abundance trends for a comparatively low cost. Rat and mouse numbers fluctuate in southern beech forest in response to food availability, generally beech seed. Periods of high rat numbers are damaging to a variety of native species, and substantial losses of bats, mohua, and other small forest birds have been recorded following 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. Each tray consisted of a plastic funnel suspended above the ground by three metal stakes and a stocking is attached to the bottom of the funnel to collect the seeds each autumn. Seedfall trays were established in pairs at least 50m apart and 50m from the nearest large forest edge. Along the stoat trap line. 2013 was the third year that seed fall was monitored in the Sinbad Gully.

The stockings were set up to start collecting on 8/2/13 and brought in on 18/6/13. 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 Te Anau Area seedfall data.

There were a low number of seeds recorded during autumn 2013; all seeds collected were silver beech. Seed fall density is usually reported as the number of seed per square metre. The Sinbad site recorded an average of 213 seeds per m<sup>2</sup> for 2013 (Table 3), considered a low amount. The result contrasts sharply with the 2011 year when an average silver beech seed density of 3446 per m<sup>2</sup> was recorded in the same trays (Fig 5).

Table 3- Beech seed monitoring results for the Sinbad Gully, 2013.

Tray ID	Started	Finished	Count	Viable	Non-viable	Seeds per m <sup>2</sup>
S 1	8.2.13	18.6.13	0	0	0	
S 2	8.2.13	18.6.13	0	0	0	
S 3	8.2.13	18.6.13	2	0	2	
S 4	8.2.13	18.6.13	4	0	4	
S 5	8.2.13	18.6.13	1	0	1	
S 6	8.2.13	18.6.13	1	0	1	
S 7	8.2.13	18.6.13	384	14	370	
S 8	8.2.13	18.6.13	84	5	79	
<b>Total</b>			<b>476</b>	<b>19</b>	<b>460</b>	<b>213</b>

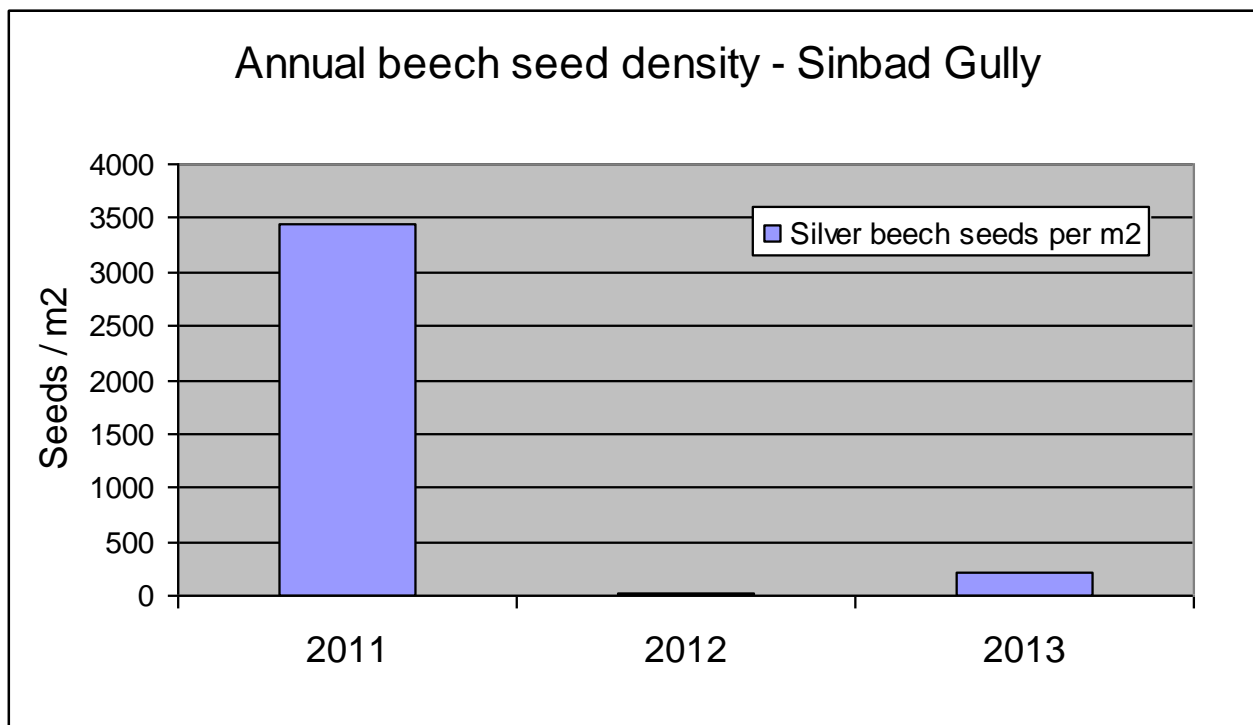


Figure 5 – Beech seed density in Sinbad Gully 2011-2013.



Figure 6 – Seed fall collecting tray

## 3.0 Outcome monitoring

### 3.1 Lizard monitoring in the alpine cirque

Lizard monitoring was completed by a team of four - James Reardon, Jo Carpenter, & Eric Edwards from DOC Science and Technical, and Simon Ralph from the Blue Duck Café in Milford Sound. The team completed a total of 46 x 15 minute survey sessions in the Sinbad cirque site over two days in late February 2013 (see the 2011/12 Sinbad annual report for method details).

Basic results indicate no significant change in the population status of the skinks and therefore no emergency management required. The maximum observed number of skinks was three adults and one juvenile. This is the same maximum number recorded in any one survey session in 2012. All individuals were photographed without capture to enable future evaluation of site fidelity of individuals.

The continued survey of wider habitat detected a Sinbad skink some >80m from the rock wall and the previous known habitat of the species. The individual was a mature male and from the amount of scat sign surrounding the small rock area occupied, the skink had been in residence for most of the summer season. No other individuals were observed away from the known site.

The mouse monitoring tunnels that were used in 2011 were removed, and a cryptic skink was also located some distance away from the rock wall. Also two weka families were observed both with near-fledged offspring.

Pest control and monitoring in the Sinbad cirque: All three stoat traps were serviced and re-baited. The lower trap had caught a stoat since the re-baiting in December 2012.

Two of the four chew tags showed signs of possum gnawing and a possum was observed during night surveying for invertebrates. Possum sign has been recorded previously in the Sinbad alpine cirque in June 2010. A moderate amount of browsing was also observed presumably caused by chamois, although none were observed on this trip.

#### **Conclusions and discussion**

Sinbad skink: The monitoring is crude but adequate to indicate the persistence of the only known population of the species.

The observation of the mature male maintaining a territory some significant distance away from the rock wall is significant and potentially lends weight to the hypothesis that the Sinbad skink is restricted to the known site not because of highly specialised niche requirements but because of the impacts of invasive pests such as stoats and mice. The location of the skink fortuitously coincides with one of the locations monitored for climate

variables in 2010-2011 and so we know that whilst not significantly different in mean thermal properties, that the site did experience a greater frequency of below-freezing hours during the monitoring period. Thus, this observation lends credibility to proposals to investigate management of the Sinbad skink at lower more accessible sites via translocation providing that rodent and stoat management is achieved and demonstrated. This prompts us to question whether we have sufficient data on the abundance of rodent and mustelids within the core skink habitat, and whether there are opportunities to replicate these dynamics through achievable management.

The fact that the cryptic skinks seem to be in a similar situation, occurring away from the rock wall but in apparently low numbers is encouraging for the same reason. The cryptic skinks also offer us an indicator species likely to be able to recover under suitable pest suppression more quickly than the Sinbad skink.

It also seems timely to suggest that some form of molecular estimation of population size should be factored into the assessment of threat for this species. We are not referring to the analogue methods of mark-recapture analysis (Craig et al 2005) but rather the estimation of effective population size (EPS) that can be achieved from a molecular sampling of the population (Kuhner et al 1995). Using these methods researchers are able to estimate the effective (e.g. female) population size using mitochondrial DNA variation. If a species is declining or threatened then one would expect the observable population estimate to appear significantly smaller than the estimated effective population. This is because the genetic variability reflected in the calculation of EPS are a reflection of recent evolutionary history for the population and so if the population is naturally small and rare, this would be reflected in the analysis. Limitations in the approach are the logistics and cost of sample collection as well as laboratory costs and also the degree to which the data would contribute to our capacity to lever greater conservation support for the species.

A short video wade made during the monitoring trip and is available to view at <http://vimeo.com/70393535>.



*Simon Ralph and James Reardon at the Sinbad skink monitoring site (photo: E. Edwards)*



## 3.2 Whio (Blue Duck) monitoring

### RESULTS

Two river surveys were completed during the 2013/13 season along the Sinbad River. Max Smart and his whio detection dog Oska were accompanied by two Southern Discoveries staff on 28<sup>th</sup> November 2012. One unbanded pair were found in the upper half of the valley in November near where a pair was found the previous year.

A second river survey was made by Max and Oska on 29/01/2013. A pair was found again near where the pair was seen in November. Single male whio were also seen in two locations in the middle of the valley, and whio sign was found at two further locations along the river, but the birds were not seen.

The trapping contractors have seen whio several times near the head and halfway down the valley where pairs was recorded during surveys last year, suggesting they may still be there but were not found during the walk through surveys.



Figure 8 – Whio or sign recorded in Sinbad Gully during 2012/13.

Red dot = Nov 2012 survey; Pink dot = January 2013 survey; Yellow dots casual sightings.

Table 4 – Summary of whoio sighting in the Sinbad Gully 2005-2013.

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	3	0	1
2011/2012	7	3	0	0	1
2012/13	7	1-2	0	0	3-4

### 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.

### 3.4 Advocacy

During February 2012 Martin Wilson and Dave Vass abseiled down the main rock wall in the Sinbad cirque to survey for alpine lizards in new locations on the rock face (Hill et al 2012). Martin wrote a trip report which was included in the 2012 New Zealand Alpine Journal published by the New Zealand Alpine Club, profiling the Sinbad Sanctuary project to the climbing and outdoor recreation community (Wilson 2012).

James Reardon also filmed a shot video about the lizard project while in the Sinbad alpine cirque which is available to view on the internet- <http://vimeo.com/70393535>.

## 4.0 Planned and Actual Budget for 2012/13

	Planned	Actual	Difference	Notes
<b>Stoat trap servicing</b>				
Bait	\$300	\$0	\$300	Covered in contractor cost
Wages/contractor	\$1,408	\$2,295	-\$887	
Helicopter	\$3,200	\$3,988	-\$788	
Additional buffer traps	\$700	\$0	\$700	Deferred until next season
<b>TOTAL</b>	<b>\$5,608</b>	<b>\$6,283</b>	<b>-\$675</b>	8 checks
<b>Tracking tunnel &amp; seed monitoring</b>				
Helicopter	\$1,424	\$1,589	-\$165	Longer flights due to road closure
Wages/contractor	\$1,408	\$1,000	\$408	One check
Groceries	\$200	\$0	\$200	Included in contractor cost
Field equipment	\$200	\$61	\$139	
<b>TOTAL</b>	<b>\$3,232</b>	<b>\$2,650</b>	<b>\$582</b>	
<b>Lizard monitoring</b>				
Climbing contractors	\$4,500	\$0	\$4,500	Not required this year
Helicopter flights	\$1,600	\$750	\$850	Subsidised by other DOC operations
Groceries	\$350	\$195	\$155	
Field equipment	\$600	\$0	\$600	Not required this year
<b>TOTAL</b>	<b>\$7,050</b>	<b>\$945</b>	<b>\$6,105</b>	
<b>Whio monitoring</b>				
Helicopter	\$712	\$0	\$712	Subsidised by other DOC operations
Wages	\$400	\$0	\$400	Subsidised by other DOC operations
Dog handler	\$0	\$0	\$0	Subsidised by other DOC operations
<b>TOTAL</b>	<b>\$1,112</b>	<b>\$0</b>	<b>\$1,112</b>	
<b>Project management</b>	<b>\$6,000</b>	<b>\$6,000</b>	<b>\$0</b>	Management, reporting, overheads, etc
<b>2012/13 Operating Total</b>	<b>\$23,002</b>	<b>\$15,878</b>	<b>\$7,124</b>	Savings from TT monitoring and lizard monitoring
<b>Possum control</b>				
Annual cost averaged over 5 years	\$5,523	\$13,525	-\$8,002	Savings made have allowed this contribution to increase this year
Contribution to possum/rat control funds held by FCT				
<b>Donation from Southern Discoveries to FCT</b>	<b>\$28,525</b>	<b>\$28,525</b>	<b>\$0</b>	
<b>Transfer from FCT to DOC</b>	<b>\$23,002</b>	<b>\$15,000</b>	<b>\$8,002</b>	

## 5.0 Operational Objectives for 2013/14

### 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.
- Install up to ten additional stoat traps to help reduce reinvasion to the valley.

#### Possum and rat control

- Investigate options for rat and possum control in the Sinbad Gully and prepare plan.
- Install possum kill-traps along the existing stoat trap line.

#### Rodent monitoring in the forest and associated beech seed monitoring

- Carryout tracking tunnel monitoring twice yearly in May and February (and on occasion in August and possibly October in years of uncertainty around expected rat tracking).
- Carryout beech seedfall monitoring in autumn (March-May), analysis funded by DOC

### 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 new 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 2010 again in 2015.



## 6.0 Planned Budget for 2013/14

	Planned	Notes
<b>Stoat trap servicing</b>		
Contractors/Wages	\$3,000	
Helicopter	\$5,000	
Additional buffer traps	\$700	
<b>TOTAL</b>	<b>\$8,700</b>	10 checks
<b>Tracking tunnel monitoring</b>		
Contractors/Wages	\$2,000	
Helicopter	\$1,600	
Field equipment	\$200	
<b>TOTAL</b>	<b>\$3,800</b>	2 checks
<b>Lizard monitoring</b>		
Contractors/Wages	\$2,000	
Helicopter	\$2,000	
Groceries	\$300	
Field equipment	\$200	
<b>TOTAL</b>	<b>\$4,500</b>	
<b>Project management</b>	<b>\$6,000</b>	Management, reporting, overheads, etc
<b>Operating Total</b>	<b>\$23,000</b>	
<b>Possum control</b>		
Annual cost averaged over 5 years	\$5,525	
Contribution to possum/rat control funds held by FCT		
<b>Donation from Southern Discoveries to FCT</b>	<b>\$28,525</b>	
<b>Transfer from FCT to DOC</b>	<b>\$23,000</b>	

## 7.0 Acknowledgements

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# Appendix 1 - Stoat trap captures per trap site

## Feb 2010 – June 2013

Tunnel site	Stoat	Rat	Sprung	Mouse	Weasel	Bird
S001		2				
S002	1	1				
S003		1	1			
S004	2	2		1		
S005	1	1	2			
S006		2	1			
S007						
S008						
S009	1	1				
S010						
S011		1				
S012		3				
S013	1		1			
S014	2	1				
S015	1	4				
S016		2				
S017	1	2	2			
S018	2	1				1
S019	1	1				
S020		4				
S021		2	1			
S022			1		1	
S023		2				
S024		1	1			1
S025	1	1				
S026		1				
S027	1	1		1		
S028			1			
S029	1	2				
S030						
S031						
S032		2				
S033		4				
S034		2	1			
S035		1	3	1		
S036			1			
S037		1	1			
S038						
S039	1	2				
S040						
S041		1	1			
S042	1	3				
S043		2				
S044	1					1
S045	2	4				
S046		2				

S047		2	1	1		
S048	1	1				
S049	2	1				
S050	1	1	1			1
S051		1				
S052	1					
S053		2				
S054		3	1			
S055	2					
S056	2					
S057			1			
S058	2					
S059	1	3				
S060	2					
S061						1
S062		4	1	1		1
S063	1	1	1			
S064	2		1			
S065		4				1
S066	1					
S067		3				1
S068	2		2			
S069	4	4				
S070	1	2				1
S071	3	1	1			
S072	1	3	1			1
S073	3					
S074	2	7				
Grand Total	55	106	29	10	1	4