PROTECTING THE INTERNATIONALLY IMPORTANT SEABIRD COLONY OF VATU- I- RA ISLAND, FIJI

Project Plan

June 2006

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1. EXECUTIVE SUMMARY

Give a brief summary of the project including its goal and objectives.

The Vatu I Ra Rat eradication Project titled “Protecting the Internationally Important Seabird Colony of Vatu I Ra Island, Fiji”, is a short term project of 6 months involving the eradication of rats from Vatu I Ra. Vatu I Ra island is a Site of National Significance and also been identified by Birdlife International as an Important Bird Area . The project involves the Birdlife international Staff (implementing Agency) and the Nagilogilo Clan of the village of Nasau who are the landowners of the island.

The goal and the main objectives of the project are to successfully eradicate rats from Vatu I Island and to use the project as a demonstration model. This project also provides an opportunity to implement re-invasion measures and to train community members in eradication and abatement methodologies.

2. JUSTIFICATION

Vatuira is a small island located in the Vatuira Channel between Vanua Levu and Viti Levu about 15 km off the north east coast of Viti Levu. The clan Nagilogilo who live in two villages on the mainland owns the island.

Birdlife International carried out an IBA assessment visit in 2003 and subsequently identified it as an Important Bird Area due to the large colonies of seabirds. Since then the clan Nagilogilo have requested the support of Birdlife International to help them eradicate rats from the island and to train community members in the long term management of the island long term.

The community wishes to develop a low impact tourism package, with safe guarded seabird and marine resources, enhanced tourist experience and greater income generation.

3. CONTEXT

Summarise the context of the project - how it reflects local, national, regional and international strategies and plans.

National and International

BirdLife International organised meetings with the Fijian Affairs Board in the early stages of project development in order to secure agreement to identify Vatu I Ra as a Site of National Significance. The Board was represented at our initial meeting with the community to seek their permission to survey the island, which was granted.

The government of Fiji has poverty alleviation as one of its key priorities. Therefore the connection between invasive species management and economic development needs to be highlighted. The success of rat eradication from Vatu I Ra and Viwa will provide a showcase for how such projects can be managed. They will act as leverage for other projects, which makes it even more crucial that they are effective. The messages need to reinforce the idea of community management of invasive species in the long term.

The Fiji Government is currently drafting the Tourism Act 2006, which is due to be presented later this year. Eco-tourism is an area, which is being given particular attention. It is expected that with the changes in the legislation, the Department of Tourism staff will be

providing more training for eco-tourism operators. This may be an opportunity to introduce awareness of invasive species and biosecurity into the curriculum.

The community has also begun to explore the process for gazetting the Island as a reserve. This will involve a detailed description of the island and the work already carried out, a confirmation of the rightful owners by the Native Land Trust Board, and agreement from all stakeholders including Birdlife International. Once the island has been gazetted people will be restricted from illegal landing and the movements of people will be monitored.

Two members of the Viwa restoration project accompanied the feasibility trip to Vatu I Ra. This provided an opportunity for them to learn more about the management of invasive species in a different environment from their own, and to see what issues need to be considered when planning rat eradication.

Regional

There are many opportunities regionally and internationally to profile this project and raise awareness of the management of invasive species. BirdLife has already written articles on the project and once the eradication has been completed, there will be many opportunities to promote it. The message in all promotions should include the community's involvement in the project and what they have learned from it.

There are numerous NGOs and networks in Fiji, which can promote this project and raise the awareness of invasive species. FLAMA, WWF, FSPI are some who have expressed interest in the project. They will also be able to use the practical example of the project to promote to the Fiji Government at central and provincial levels to encourage more action on the management of invasive species.

Local

People at the community meeting mentioned that some villages along the coast had expressed interest in the eradication project. The people at the meeting said that they were happy to have the project profiled and to have people come to see what they had achieved with the project. BirdLife have two further islands in mind, close by, that would benefit from rat eradication.

4. PROJECT STAKEHOLDERS

Stakeholder	Positive impact	Negative impact	Level of agreement
Clan Nagilogilo	• Eco tourism will have economic benefit • Training in management of IAS • Reclaiming active management of key cultural site • Capacity Building	• Potential cost of management of island • Unexpected impact of economic development on community	high
Birdlife International	Protection of IBA	Long term commitment of staff	high
Provincial Government	Enhanced development at Provincial level	Withdrawal of support from the project.	high
Tourist Operators	Could enhance their tourist product	Payment of levy to clan	Medium
Tourists	• An enhanced experience due to increase in the range of birdlife, • Well informed local guides	May be prevented from landing on the island More regulation May incur extra cost	unknown
Fishers	Better informed	Restricted from landing and taking birds, eggs and turtles	unknown

5. FEASIBILITY

Summarise the main findings from the Feasibility Study.

Findings

The island is approximately 300m long and 100m wide and flat for the most part with rocky promontories at each end of the island. The shoreline is a mixture of coral beach and steep headlands. The island has an open canopy of *Pisonia grandis* allowing for easy movement throughout.

Native wildlife observed:

The following species were identified on or near the island:

1 Lesser frigate bird (*Fregata ariel*) – flying in numbers around island.
2 Masked booby *(Sula dactylatra*) – adults and late chicks on rock outcrop
3 Red footed booby (*Sula sula*) - small number on nests in *Pisonia grandis*

4 Brown booby (*Sula leucogaster*) – flying in numbers around island
5 Crested tern (*Stera bergii*) – eggs and chicks on rock ledge. Approximately 30 nests; one egg / chick per pair
6 Black naped tern (*Sterna sumatrana*) – larger number of eggs on coral beach – one egg per pair.
7 White tern (*Gygis alba*) – one pair possibly with nest
8 Black noddy (*Anous minutus*) – numerous nests in *Pisonia grandis.* Eggs and chicks at all stages. One egg / chick per pair in nests comprising *Pisonia* leaves feathers and guano.
9 White-tailed tropic bird *(Phaethon lepturus*) - one pair circling the island
10 No land birds were seen.
11 Pygmy snake-eyed skink *(Cryptoblepharus eximius*) – low numbers in rank vegetation on perimeter of island.

Presence of Invasives

Mammals

The only invasive mammal identified on Vatu I Ra is the Pacific rat (*Rattus exulans*). There are no reports of other rodents being present. No research has been carried out to assess the effect on the bird and reptile populations on this island but the team found evidence of recent black noddy chick predation to indicate that rats are feeding on this available food source. Given the dense rodent population (two Pacific rats were seen running through the forest in daylight) and food limited to that on the beach, and numerous breeding birds (no fruiting trees were found), it is assumed that the effect on breeding birds is significant over time. All the birds identified as breeding on the island have one chick per season; therefore any predation will have significant population-level impacts. There were two ground nesting tern species found nesting on the open perimeter but no species using the ground beneath the forest. This may be the result of fallout from the intense nesting in the canopy, or predation by rodents.

Weeds

During time on the island the invasive African veld grass was found in three locations. This weed is of concern as once left to mature it provides a significant risk to the Island ecosystem including the ground nesting bird habitat.

Management of the weed needs to be incorporated into the operational plan and if possible undertaken at the same time as the rat eradication. The Clan, with the support of Birdlife, will need to develop a long term management plan for the control of this weed.

Harvesting

The clan advised the feasibility team that some harvesting occurred on the island. Fishermen who use the island as a campsite mostly carried this they out. On landing on the island the next day for the site visit we found two fishermen camped. They had been fishing, and had come from Suva in a 6m open boat. Two very recent fire pits were found near their camp. One included the bones of a large seabird, possibly a booby. The other pit had green turtle bones and shell along with crested tern eggshells. The men departed the island shortly after we landed.

The clan had requested that BirdLife construct a large sign, which they could erect on the Island in order to inform people of the importance of the island's ecology. The site visit provided the opportunity to erect the sign which stated; *"The Yavusa Nagilogilo wants to remind visitors that Vatu I Ra is being identified as a site of National Significance due to its wildlife. Therefore you are required not to litter, cut trees, harvest eggs/birds, disturb*

breeding sites or poison fish." The sign was in English and Fijian and was signed off with the words "*Fijian Government*

Conclusions

The feasibility team concluded that:

1. The island of Vatu I Ra is suitable for the successful eradication of the Pacific rat population. This operation should be undertaken in July 2006.
2. A ground-based operation using Pestoff 20R manufactured baits containing the anticoagulant Brodifacoum should be employed.
3. Baits should be hand-spread over the entire island along marked lines to ensure total coverage. In addition elevated bait stations should be used in areas of high hermit crab densities as a back up to prevent crabs consuming baits intended for rats.
4. Based on similar operations elsewhere it was concluded that non-target risks to resident seabirds and lizards are negligible.
5. The Nagilogilo Clan understands and supports the project, and is willing to be involved.
6. BirdLife International has successfully engaged the local community in the project and has established access to advice and support for the development of the island.

The feasibility team recommends the following:

1. an eradication project is undertaken based on the methodology described in this report
2. the opportunity this project presents to refine rodent eradications in the presence of crabs should be taken
3. an operational plan is prepared in line with PII requirements
4. A biosecurity plan is prepared prior to the eradication and is consistently implemented.
5. A biosecurity officer is nominated by the Clan
6. A training session be designed and delivered to all those participating in the eradication to ensure safety and quality standards are employed.
7. An awareness package be developed on invasive species and delivered as a workshop with the community and as part of the training for guides for the eco-tourism project. The issue of reinvasion prevention needs to be part of this package.
8. A six-monthly monitoring Programme is scheduled by Birdlife to cover two years from the eradication.
9. Eradication of veldt grass is undertaken as soon as possible.

6. PROJECT DESIGN

6.1 GOAL

To protect the Internationally Important Seabird colony of Vatu I Ra.

Incursions by invasive species to Vatu I Ra, as with any other islands of national significance, will be an issue that requires on-going surveillance and the application of appropriate response measures when they occur. Education for all users of the island will also be important. As a first step in this process the owners erected a sign provided by BirdLife International indicating to visitors both ownership and the significance of the island to the owners and internationally. During our talks with the clan we discussed the requirements of quarantine and education. The clan is to pursue gazetting of the island through the statutory process to further enhance the island's stature and provide legislation to support protection. A prevention plan will need to be prepared which outlines appropriate quarantine and

contingency procedures. On-going surveillance monitoring to detect any new rat incursions will be critical.

6.2 OBJECTIVE

- To successfully eradicate rats from Vatu I Ra island and to use this as a demonstration model.
- Implement re –invasion abatement measures (permanent bait stations on the landing site and frequent visitor boats, placement of information boards).
- Training of community members in eradication and abatement methodologies.

The main aim of the project is to successfully eradicate rats from Vatu I Ra Island therefore use this as a demonstration model. Removal of pacific rats from the Island will augment the seabird population and possibly lead to the return of ground–nesting (and perhaps burrowing) seabirds.

Studies on temperate islands in New Zealand indicated that Pacific rats have substantial impacts on forest structure through selective consumption of seedlings and the seeds from large-fruited trees (e.g. Campbell and Atkinson 2002). They also affect invertebrates and several species of lizards (Towns et al. in press).

Limited numbers of the indigenous pygmy snake-eyed skink (*Cryptoblepharus eximius)* was observed in the perimeter vegetation. This species may benefit from removal of Pacific rats, but at present there are no records of the effects of these rats on tropical reptiles to use as a guide. Furthermore, there are reports of behavioural changes by lizards in New Zealand once Pacific rats were removed (Atkinson and Towns 2005), and the recovery of some species of geckos suppressed to such low levels they could not be detected while the rats were present (R. Parrish *pers.comm*.). The appearance of unreported species of lizards on Vatu I Ra after rats are removed is therefore possible, and is a strong incentive for post-eradication monitoring.

6.3 OUTPUTS

Describe the identifiable results that need to be achieved to reach project objectives.

Objective 1

To successfully eradicate rats from Vatu I Ra Island and to use this as a demonstration model.

Outputs

1.1 Eradication of rats programme developed and implemented

1.2 Local community members are trained in rat eradication methods

1.3 Awareness of invasives and their impact on biodiversity is raised

Objective 2

Implement re –invasion abatement measures (permanent bait stations on the landing site and frequent visitor boats, placement of information boards).

Outputs

2.1 Consultation with tourist operators, fishermen and other visitors is undertaken to raise awareness about preventing re-invasion by rats

2.2 Negotiation with government agencies to have the Island gazetted as a reserve.

2.3 Sign erected on the Island proclaiming ownership and to notify visitors that no harvesting is allowed from the Island

Objective 3

Training of community members in eradication and abatement methodologies.

Outputs

3.1 Training programme run by Rob Chappell, Department of Conservation, NZ to be attended by Birdlife Staff and members of the clan – on eradication methods, bird and other wildlife identification and monitoring.

6.4 ACTIVITIES

Provide details of activities required to achieve project outputs.

See operational plan.

7. RISK AND RISK MANAGEMENT

Identify major risks that may potentially interfere with the successful implementation of the project and strategies to manage those risks. Following is a template for capturing this information.

No	Cause of Risk	Type of Risk	Effect on Project	Likelihood	Severity	Risk Management Strategy	Responsibility
1	Failure to develop tourism venture	Economic	Vatuira island is 15 km from the mainland and costs $xxx in petrol each boat for a return trip. The local community will not be able to properly manage abatement strategies unless they can monitor the island regularly. Local tourist operators take people on charters to the island regularly – but they may	3	major	• Survey the tourist operators currently visiting Vatuira- web search, phone calls, visit, and a local community member monitor numbers at the site of reservations, or on the island (whilst conducting other monitoring) • Clan negotiate with tourist operators for per capita fee per passenger or per trip.	Community with help from Birdlife

No	Cause of Risk	Type of Risk	Effect on Project	Likelihood	Severity	Risk Management Strategy	Responsibility
			resist paying compensation and avoid the area.				
2	Tourists impact on island ecosystem	Environmental	Visits to the island if not managed well could have a negative impact on the nesting birds. Feasibility team noticed eggs along seashore plus chicks – easy to step on. With the rats eradicated, ground nesting birds may return in large numbers – thus be vulnerable to people walking around.	4	major	Either prevent people landing at all, or restrict movement to clearly defined paths. This would need to be carefully managed and its success inextricably linked to the success of negotiations with the tourist operators	Community with assistance from Birdlife
3	Expensive Fuel Costs	Economic	The high cost of fuel prices to the island would limit the number of visits to the island	3	minor	For the team that goes to the island to stay on the island until all the research needed to be done is completed	Team leader to make the decision.
4	Rough Sea	Safety	Delay the arrival of the team on the	4	Major	Seek long-range weather forecasts. Modify	Team leader

No	Cause of Risk	Type of Risk	Effect on Project	Likelihood	Severity	Risk Management Strategy	Responsibility
			island on the scheduled date. :			operational dates to suit	
5	Lack of commitment by field staff	Undelivered Project outputs	The project work would then lack accuracy and enthusiasm	3	3	Carefully select staff. Focus on motivating and empowering staff. Promote & facilitate team building.	Team Leader to motivate the team members
6	Inadequate institutional support	Lack of Support	Different organisations are specialised with different skills that could then compliment the project.	1	2	To gather enough institutional support by asking them to provide assistance technically.	Project manager (Birdlife)
7	Unclear tasks	Confusion among Team members	This would confuse the team members resulting in the operation being unclear.	3	3	To inform the team members of what is expected from each member .By attending a briefing before going out in the field.	Project manager ((Birdlife)

Likelihood - Almost Certain: 5, Likely: 4, Possible: 3, Unlikely: 2, Rare: 1
Severity - Severe: 5, Major: 4, Moderate: 3, Minor: 2, Negligible:

8. PROJECT IMPLEMENTATION

The Pacific Invasives Initiative (PII) is a programme of the Cooperative Initiative on Invasive Alien Species. The Invasive Species Specialist Group (ISSG), an expert group of the Species Survival Commission (SSC) of The World Conservation Union (IUCN), hosts the PII.

The goal of the PII is '*To conserve island biodiversity and enhance the sustainability of livelihoods of men, women and youth in the Pacific*'. This goal will be achieved through the objective of reducing negative impacts of invasive species primarily by managing them at selected Demonstration Projects in Pacific Island Countries and Territories. The capacity to network on a global scale is a major strength that the PII will bring to this project.

Department of Environment – BirdLife International has a Memorandum of Agreement with the Fiji Department of the Environment (DoE). DoE have supported management on Vatu I Ra, particularly since it has been listed as a Site of National Significance in the National Biodiversity Strategic Action Plan. Previously, the Fiji Government did not have adequate data to demonstrate the national and international importance of the site. This has been provided through the BirdLife IBA process.

Fijian Affairs Board – have pledged support in providing assistance in protocols and other traditional obligation that BirdLife needs to arrange within the community.

WWF – have liaised with BirdLife. Their main interests are in the marine environment and Vatu I Ra as a turtle-breeding site. A notice board requesting visitors to not damage or disturb the island has been produced.

University of South Pacific - assisted BirdLife during the first survey and have done a baseline survey of marine biodiversity. A student will be selected to assist with the project and a research project developed that will contribute to a postgraduate qualification. USP is undertaking rat eradication on Viwa and have exchanged information and support with BirdLife on this project.

Partners in Community Development – PCDF have a group of qualified trainers and facilitators who work with communities at the village level and have agreed to look into the possibility of working with the clan on their overall economic development. Their vision statement is "communities achieving equitable, holistic, and sustainable livelihoods.

Foundation of the Peoples of the South Pacific. FSPI is a network of independent, like-minded affiliate NGOs who work with communities in nine Pacific countries. They provide a range of programmes including; capacity development in rural communities, research and development on technical and socio-economic aspects of coastal management, policy development governance, education and awareness and media and communications. Once the vatu I Ra project has been undertaken FSPI will be a useful medium for promotion of the project and the lessons learned from it.

Live and Learn Environmental Education This is a non- profit, non-government organisation that aims to promote greater understanding of environmental and human sustainability through education and communication.

9. SUSTAINABILITY

Outline how the objectives of the project will be sustained in the future.

Birdlife International has an ongoing interest in the monitoring of the seabird population. It has engaged the services of Environmental Consultants Fiji to conduct monitoring programme for the Island and to train local members of the community to monitor changes in the island biodiversity.

10. COMMUNITY PARTICIPATION

Describe how local community groups have been or will be involved in the project.

BirdLife International has had ongoing consultation with the Nagilogilo clan. This was initiated when BirdLife undertook a bird survey on the island in 2004. Project Leader Vilikesa Masibalavu has met with the community six times since 2003 and has developed a good relationship with them. He supported them in their attempts to negotiate with agencies to highlight their ownership and management of the island and their desire to develop income generating activities. The community have been involved in the feasibility study and they would be trained in the eradication work and ongoing management of the island .

Describe the type and level of involvement of the community groups (including women and youth) in the project.

The community are the focus of the project, as without their consent this project would not possible. There has been ongoing meeting with the whole community involving everyone during the meeting, all the issues that have been raised by the community are then noted down and Birdlife would then facilitate to help out. It has been recommended that the youths would be involved in training such as bird identification, monitoring and eradication techniques.

11. TRAINING

Describe project training needs and how these will be met.

Rat eradication Specialist Rob Chappell is providing Birdlife with technical support and advisor to the project through PII. During the project of eradication the team which consists of Birdlife international staff members and the Nagilogilo clan are taught techniques /concepts of eradication, monitoring and long term management of the island.

The representatives from the community are the youths from the landowning community where they are trained. These youths were chosen to be the guides that would take tourist on a tour of the island as a result it generate some income.

For the long term management of the island the villagers will be taught of the quarantine measures that needs to be implemented such having thorough checkups of baggage of visitors on the island, for boats to have permanent bait stations that regularly visit the island, and also on the main loading areas.

12. PROJECT MANAGEMENT

Briefly describe the project management structure including roles, responsibilities, reporting relationships, decision processes, and conflict resolution.

BirdLife International (Fiji) is the implementation agency responsible for the eradication operation and for monitoring of the project. They are a professionally run organisation with highly capable staff. However the staff have many competing demands and there needs to

be a system put in place to ensure that the Vatu I Ra project is supported long past the time the project funds are spent. The relationship established with the community is strong, and will need to be maintained particularly over the next few years to ensure that the benefits of the eradication are maintained. This will have implications on staff time and resources.

The long term success of the project is dependent on the quarantine measures being maintained and the Island monitored, and this requires a long term commitment from Birdlife and from the community. We recommend that one community member be given responsibility for the Island biosecurity so that this person can be supported and trained where necessary.

Specific roles:

Project manager	Vilikesa Masibalvau; project oversight and consultation.
Team leader	Elenoa Seniloli; operational supervision and quality control.
Technical advisor	Rob Chappell (Dept of Conservation NZ); technical advice, training and operational support.
Field team	members of the clan Nagilogilo; implementation of field tasks.
Planning coordinator	James Millett; financial management, planning and reporting
PII coordinator	Souad Boudjelas; PII oversight & advice, peer review.

13. TIMEFRAME

Give an indicative timeline for the different project activities.The more detailed this is the easier it will be for potential funders to make decisions on support.

Total project implementation time 4 months
Work plan/ time frame February – June 06

Feb
Assessment visits
Preliminary community meetings
Sourcing and ordering of materials
Set up of student project

March
PRA and agreement of eradication and abatement plan
Training of staff and community members
Assessment visit and grid marking/cutting

April
Ground based eradication implemented with 3 applications of bait 10 days apart
Follow up monitoring visits
Implementation of abatement measures

May - June
Monitoring visit, removal of eradication materials etc
Monitoring of abatement implementation
Reporting

Thereafter abatement protocols will be carried out by designated community members

14. MONITORING AND EVALUATION

Monitoring is the process of collecting, analysing, reporting and using information about a project's progress and initial effects. It provides those managing the project with information on which to base decisions.

Evaluation is an assessment of an ongoing or completed project, its design, implementation and results. An evaluation should provide information that is credible and useful, so that lessons learned can be incorporated into decision-making processes. An evaluation timetable will be determined in the operational plan.

Describe what processes you will use to monitor and evaluate the project against the indicators identified in the Project Design Components table (Appendix 1). Identify who will be responsible for different activities, the methods proposed to collect data and the timing of various M&E activities. Following is a template for a Monitoring and Evaluation Plan.

Monitoring and Evaluation Plan – measuring change

Demonstration Project considerations	**Indicators (measures to assess change)**	**Baseline Situation (i.e. before project)**	**Data Needed (to measure change)**	**Method of Collecting Data**	**Timing (when & how often will data be collected)**	**Responsibility (who will collect data)**
1 Biological parameters	Absence of rats	Island overrun by rats	no. of rats present	Bait stations tracking tunnels Wax tags	one month after rat eradication, then six monthly for two years	Birdlife and clan
	Increased bird population (returns to the level of "umbrella of birds" described by elders)	Survey by Birdlife 2004	Number of birds and range of species	Surveys	same as above	same

Demonstration Project considerations	Indicators (measures to assess change)	Baseline Situation (i.e. before project)	Data Needed (to measure change)	Method of Collecting Data	Timing (when & how often will data be collected)	Responsibility (who will collect data)
3 Community awareness	Increased ability to identify the plants and animals on Vatu I Ra Increased understanding of the effects of rats on biodiversity	Incomplete knowledge on the biodiversity and ecology of Vatu I Ra Incomplete understanding of the effect of rats on biodiversity	Self assessment by individual community members	Meeting and interviews	By the end of 2006	Birdlife
4 Implementing Agency awareness	Production of Several awareness items in the Newspapers and Television	No publicity	Number of articles and media events	Articles collected	Continuous	Birdlife
5 Community capacity	Clan members able to participate in rat eradication projects Clan members able to describe Island biodiversity	None Limited	Number of clan members involved in rat eradication work Number of clan members trained in recognition of Island biodiversity	Interviews Interviews	By end 2006 End 2007	Birdlife
6 Implementing Agency capacity	Staff increased knowledge and skills for rat eradication projects	Some skills and knowledge	Self and agency assessment	Interviews and future responsibilities	End 2006	Birdlife

2 This will be a summation of areas 1 to 6 and addressed through evaluation at the end of the project

15. ESTIMATED EXPENDITURE

Please provide an estimate of expenses for the project.

Activity	Cost Fj$	Cost NZ$	Total $US
Preparation			
PRA / Agreement of eradication and abatement plan, training and workshops advocasy materials	$2,800		$1,618
Eradication costs			$0
2x 25kg brodifacoum 2x, block bait 2x 10kg, airfreight		$775	$542
Pipe bait stations 75	$15		$9
H&S equipment, hipchain, misc field equipment		$800	$559
tracking tunnels and traps		$100	$70
Labour costs	$2,500		$1,445
Abatement materials			$0
Permanent bait stations x 20		$150	$105
Information signage	$1,000		$578
Transport			$0
Transport	$1,400		$809
Boat transportation – 15	$9,000		$5,202
Acommodation and subsitence	$2,000		$1,156
Administration	$1,500		$867
Costs for student research/ materials / transport / perdiems	$8,000		$4,624
Total			**$17,585**

REFERENCES

Atkinson, I.A.E., Towns, D.R. (2005) Kiore. Pp 159-174. In The Handbook of New Zealand Mammals (Second Edition) King, C.M. (ed). Oxford University Press, Melbourne