



BP Conservation 2005 Final Report

Research title

Project no 700305 Solomon Islands: Distribution, habitat preference, and conservation status of the endemic giant rats *Solomys ponceleti* and *S. salebrosus* on Choiseul Island, Solomon Islands.



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(Survey: August – September 2005, January 2006)

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March, 2008

Introduction

Poncelet's giant rat (*Solomys ponceleti*) and Bougainville giant rat (*S. salebrosus*) are giant-rats found only on Choiseul and Bougainville Island in northwest Solomon Islands. Populations of *S. ponceleti* and *S. salebrosus* have been declining due to large-scale industrial logging, hunting, and predation by introduced mammal such as cats and dogs, and from competition by introduced rats (*Rattus rattus*, *R. exulans*, *R. norvegicus*). The giant rats of Choiseul are today extremely rare. They are also shy and cryptic tree rats which makes them especially challenging to survey in the canopy of trees of large girth in old growth forests. Populations of *S. ponceleti* and *S. salebrosus* were discovered at Olivetti in the interior of northwest Choiseul, and near the proposed Pisuka Forest Reserve close to Sasamunga Village, Southwest Choiseul Island.

The aim of this project was to study the distribution, habitat preferences and conservation status of native terrestrial murid rodents around Choiseul Island. The study was carried out in at different sites around the island of Choiseul including the montane areas above 700m on Mt Maetambe. This was done using a combination of methods, including arboreal trapping, spotlighting and daytime searches, set up of local snares, and the use of hunters and dogs. The immediate benefits of this survey were that it: 1) provided preliminary baseline data and information on the distribution, habitat preference, ecology, conservation status, and a record of ethnobiological knowledge of *S. ponceleti* and *S. salebrosus* throughout Choiseul Island; 2) updated opportunistically a faunal list of other vertebrates; 3) may be used to develop a conservation plan in a Melanesian context to establish areas of conservation value as wildlife management areas (WMA) on Choiseul Island, which may be proposed to local communities, the indigenous Lauru Land Conference, Lauru Indigenous Resource Owners Association Trust Board, Inc., the Provincial Government, and Government Department for Environment and Forestry for endorsement.

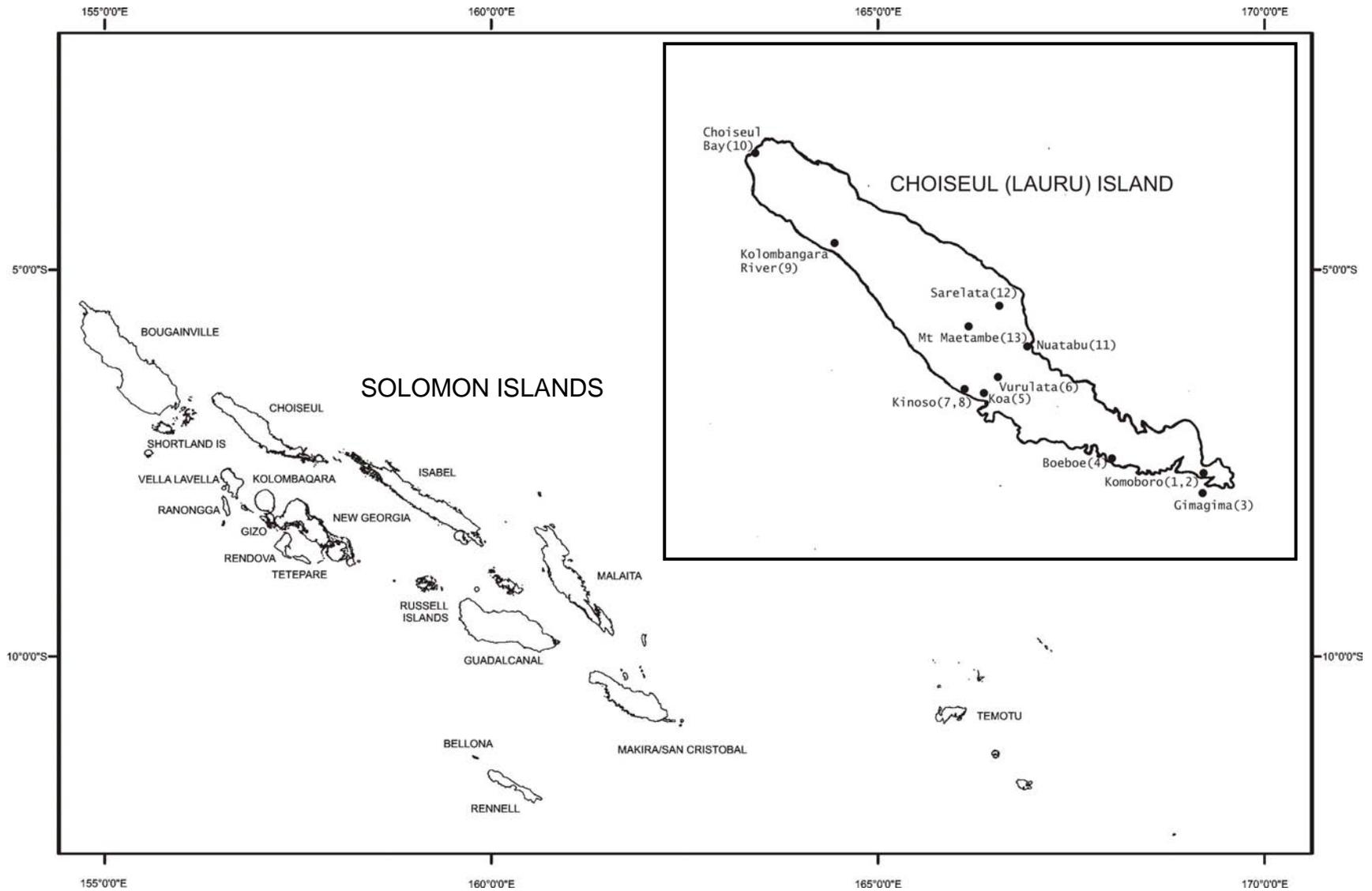


Fig. 1. Map of Solomon Islands including location of study sites on Choiseul Island. For details of study sites corresponding to locations 1-13 see Table 1.

Aims and objectives

This research aimed to study the distribution, habitat preferences and conservation status of native terrestrial rodents. It aims to investigate the presence and absence of *S. ponceleti* and *S. salebrosus* round Choiseul Island in the Solomon Islands. The objective was also observe whether current populations of these species are influenced by forest type, land management practices such as clearing for agriculture or logging, or the presence of introduced species, by comparing and contrasting several sites throughout the island. An effort was also be made to record traditional knowledge and the significance these small mammals to the indigenous peoples and to the biodiversity of the Solomon Islands.

Specific Objectives:

This research focused on:

1. Recording the presence and absence of *S. ponceleti* and *S. salebrosus* in different areas and habitat types (lowland, mid-montane, montane) throughout Choiseul Island.
2. Assessing if native rats are more abundant in different natural habitat types or areas.
3. Gather basic ecological information on the two native rats (*S. ponceleti* and *S. salebrosus*) including food and nest requirements, activity patterns, densities, habitat characteristics, and other relevant information.
4. Test the efficacy of different small mammal research techniques in Solomon Island habitats.
5. Assessing whether native rat populations are impacted by different land use practices such as logging, agriculture, or areas with high numbers of alien species.
6. Recording, through interviews, traditional knowledge and the significance these small mammals to the indigenous peoples.
7. Synthesizing information gained on native rats with forest cover data, watershed data, logging activity, and existing information on birds, herpetofauna, and plants to develop a draft conservation strategy and action plan for Choiseul Island.

Research Methodology

Surveys were conducted from June to August 2005, and in January, and March 2006 around Choiseul Island. There were 10 sites in all surveyed, ranging from different forest types and at different elevations on the island.

a) General description of Choiseul Island.

The island of Choiseul is the sixth largest island in the Solomon Islands and covers a total landmass of 3,294km². The island forms part of the northern chain of islands in the Solomon Islands double chain of islands. This northern archipelago includes, Bougainville, Isabel Malaita, and Makira Island.

The climate here is of tropical equatorial and is influenced by maritime weather patterns. Southeast trade winds blow between May and October. July is often wet unlike most islands in the Solomon Islands, when these months are generally dry. The island for the most part is covered by medium height, medium crowned, closed canopy, and tropical hilly jungle.

The topography of Choiseul Island is also varied. To the southeast the sharp volcanic peak of Komboro is an elevation of 600m. Streams run down the slopes and valleys of this peak. Ridges of basalt in varying altitude range from up to 800m. Mt Maetambe (1060m) dominates the central cordillera and is a plateau in the centre of the island. Here cloud forests cover most of this area. Due to the Massenerhebung effect where altitudinal zonation large islands for example New Guinea, are compressed on small islands, this plateau represents the only montane forest formation on the island. To the northwest are moderate gently sloping hills, and to the east low lying island, remote reefs, rocky outcrops, and shallow shelf seas (Ridgway & Coulson, 1987).

Some common trees in the lowland forests of Choiseul include, *Terminalia* spp., *Terminalia brassii*, *Dillenia* species, Rosewood (*Pterocarpus indicus*), Pencil cedar, Sago

palms (*Metroxylon* spp.), and Ngali nut (*Canarium indicum*) trees. Ferns of the species *Diplazium esculentum*, *Cyclosorus magnificus*, and *Dennstaedia samoensis* are prominent near the river edges and sporadically extend under the forest undergrowth.

b) Field surveys on Choiseul Island

Prior to the field survey, possible sites were chosen around the island, to obtain a clear representation of the possible distribution and habitat type these arboreal giant rats may inhabit. Our choice of sites were based on vegetation cover, local information obtained from hunters, reports from the Environment department, and on our connections to forest dependent communities in order to gain access to forest sites. Although the latter may seem inconsequential, it is significant in an island where almost all the land is customary owned, and is a type of private ownership. We were allowed access to all sites proposed except for one. In this case, unrealistic demands were made by the community.

c) Environmental Awareness promotion

A number of environmental awareness campaigns were held at different sites during the course of the survey. These were held at Boeboe Village, Nuatabu Village, Vagara Village, Robroy Island community, Pujivai Community High School, Choiseul Bay Senior Secondary School, Sasamunga Community High School, and Lauru Rural Training Centre. In all 8 presentations were given at different locations around Choiseul.

The talks presented covered a number of topics, including the biodiversity of Solomon Islands, with a focus on Choiseul Island, the threats to biodiversity, and recommendations.

Many were ignorant of the rich yet fragile biodiversity of the Solomon Islands. Time was given for questions, discussions and the sharing of information relating to the environment.



Figure 1: David Boseto presenting a talk at Sasamunga Community High School, Southwest Choiseul



Figure 2. Communities of Lauru Rural Rural Training Centre



Figure 3. Communities of Boeboe Village, Southeast Choiseul



Figure 4. Tikai Pita (BP Team member) and students of Pujivai Community High School.

During the course of the field work, training in general vertebrate taxonomy was also provide to field guides, and porters that were interested.

We found that there were many students and villagers that were ignorant of the biodiversity and especially of the giant rats, *Solomys ponceleti* and *S. salebrosus* on Choiseul Island. As a result of these meetings, we were able to raise the awareness of these species and in general the biodiversity of the island to communities that otherwise would not have access to this information.

d) Inventory techniques

Coconut baits were placed randomly around the survey site. This was done in order to acquire some indication of mammal activities at night. In the morning these coconut baits were checked for bite marks as sign of feeding activity.



Use of Cage Traps

Prior surveys for these large giant rats using galvanized steel cages were carried out by Patrick Pikacha in 2004. As a result of these preliminary surveys cage traps proved to be unsuccessful and laborious. Despite more than 400 trap nights using cage traps for rapid inventories of small mammals no native rats were caught. Only *Rattus exulans* was regularly caught. Native rodents seemed to be sensitive to oils secreted from the palms of humans whilst handling these cage traps.



Local snares

Local traps designed by hunters and local wildlife collectors were used during this survey. This proved to be the best and most efficient method for trapping small mammals, in particular the Spiny rat (*Rattus praetor*) on offshore islands. These snares were also very successful in snaring birds, in particularly Ducorp's cockatoo (*Cacatua ducorpsii*). Interviews with local's of Boeboe Village revealed that a number of other species of parrots like Cardinal lorries and Eclectus parrots have been caught using these local snares and sold to logging steamers.



Rattus praetor caught in local snare.



Ducorp's cockatoo caught in local snare.

The use of hunting dogs

Hunting dogs were most efficient in search for *Solomys*. Although not recommended as most times the animal was either badly injured or killed according to local hunters.

Observational Techniques

Standard observational techniques were employed throughout the course of this survey. These include spotlighting at night, and day time searches. These were unsuccessful on this trip. However, given more time in the field, it is supposed that this technique would have shown some results.

3.2 *Macrohabitat classification*

Based on composition of species and height of vegetation strata and location of captures, sightings or knowledge of species present by locals, these forest types were grouped into

general forest type, such as lowland forest, mid-montane forests, montane forests, secondary forests, or primary forest.

3.3 *Microhabitat and autecology*

The common tree species and vegetation characteristics of each site were recorded. An observation of soil texture and leaf litter characteristics was noted. There was no opportunity to take temperature readings, relative humidity readings, and precipitation readings.

3.4 *Ethnobiological information*

Local knowledge of the species was recorded throughout the duration of the survey through informal conversations and interviews.

4. Results

These outcomes are the results of field work carried out on Choiseul Island, between August – September, 2005, and January – February 2006. In all a total of 16 sites were surveyed during the course of the fieldwork. These sites ranged from lowland rainforest from sea – level to submontane forests. A montane site at Mt Maetambe the highest plateau on Choiseul Island was surveyed as well. A description of these sites is presented in table 1. GPS locations of these sites were recorded and stored on the GPS memory. This was later lost as the GPS apparatus broke down.

Lowland sites were dominated by *Terminalia* spp trees, *Casuarina* spp., *Metroxylon* spp., *Areca* spp., and *Syzygium* spp. tree. Emergent forests were surveyed as well, with high canopy cover. Secondary forests were dominated by *Canarium* spp., *Metroxylon* spp., and the undergrowth dominated by ferns.

Table 1: Site details

Site no.	Site name	GPS Location	Elevation (m)	General forest type
1	Komoro		0 – 100	Lowland forest, <i>Casuarina</i> sp. pine forest, mixture of <i>Terminalia</i> trees, undergrowth dominated by palms, pandanas, and ferns. Leaf litter predominately <i>Casuarina</i> sp.
2	Komoro (inland)		100	Pandanas, palms dominate understory.
3	Robroy Island		Sea – level	Coastal streams, palms, secondary forests
4	Sivata Island		0 – 50	Coastal plants, <i>Pometia</i> sp. palms
5	Boeboe Village		Sea – level	Secondary forest, gardens, grasslands
6	Tabirulato Island		Sea – level	Pandanas, palms, coconut trees, mangrove forests
7	Koa Village		Sea – level	Village, village outlier, dominated by pineapple patch, coconuts, <i>Metroxylon salomonense</i>
8	Vurulata		0 – 100	Lowland forest dominated by <i>Terminalia</i> trees, wild bananas, ferns, and palms
9	Kinoso (Lake)		100 – 200	Near aquatic vegetation. Secondary forest.
10	Kinoso (village outlier)	S07°13.101' E156°56.309'	0 – 100	Coastal slope forest. Secondary forest dominated by gingers (<i>Alpinia</i> sp), <i>Canarium</i> trees.
11	Lauru Rural Training Centre upper Kolombangara River	S06°59.060' E156°45.960'	100 – 200	Rivers edge dominated by ferns, palms, <i>Terminalia brassii</i> forests.
12	Choiseul Bay		0 – 100	<i>Terminalia brassii</i> forests, <i>Syzygium</i> trees
13	Nuatabu hills		100 – 300	Dominated by <i>Metroxylon salomonense</i> , secondary forests, and old village gardens
14	Sarelata		500 <	Old overgrown gardens/village, understory dominated by gingers, palms, <i>Areca</i> sp., <i>Syzygium</i> sp.
15	Mt Maetambe		800 – 1000	Montane forests
16	Olivetti Village (outlier)		200 – 400	Upland secondary forest, gardens, forest edges

Table 1



Fig 2: Map of Choiseul Island with survey sites in white labels (Source: Google earth)

In total there were six sites of primary forested areas surveyed. Of these six sites two sites were located above 500metres. These included Sarelate and Mt Maetambe. The rest of the sites surveyed were in lowland rainforests below 500m.

The other ten sites surveyed during the course of the field work were a mixture of disturbed and primary forest. Some sites consisted of tall secondary forests. These sites were searched for the presence of giant rats. After interviews with villagers some offshore islands were also surveyed. Offshore islands only showed an abundance of the aboriginal introduction, the spiny rat or *Rattus praetor*. All did not show any indication of giant rats. Yet phalangers were found to be abundant here, especially amongst strangler figs.



Fig 3: Choiseul Bay area, on northwest Choiseul Island. Satellite map shows extensive damage of forests due to logging. (Source: Google earth)

The Choiseul Bay area around northwest Choiseul has been extensively logged. Inshore coves, and some forests along the rivers still remain intact, but are surrounded by disturbed forests and forest plantations. Ironically, according to local informants *S. Salebrosus* is found to occupy emerging secondary forest trees in these disturbed forests. A few days were spent here. Strangler figs within disturbed areas were also surveyed by spotlighting. The occurrence of *Melomys bougainville* was reported in the area by locals.

Mammals caught during the survey

In total there were seven mammals sighted during the course of this survey. Most of these were bats. And most of these species were caught or sighted on Mt Maetambe and in the upper reaches of the Kolombangara River on southwest Choiseul.

There were no giant rats caught on Mt Maetambe during the field work. A solitary individual of the cryptic and endangered Bougainville Monkey – faced bat (*Pteralopex anceps*) was sighted in high strangler figs on the slopes of Mt Maetambe.

One individual of Bougainville Giant – rat (*Solomys salebrosus*) and another of Poncelet’s Giant rat (*S. Ponceleti*) were captured at Olivetti Village. This was done with the aid of hunting dogs. A tree was felled and an individual of the latter was captured. More than 3 individuals were found in the tree, but escaped.

The individual of *S. Ponceleti* was captured on another occasion and killed and eaten. No photographs of this species was taken, as there was no camera carried during this time. However, the individual of *S. Salebrosus* was photographed and also killed and eaten by the locals.

As a result of this field work, it is apparent that there needs to be a conservation campaign to target the protection of these species. There was no sightings of *Solomys ponceleti* elsewhere throughout the island. However, Leary (*pers. comm*) confirmed a capture of the species in the hills above Posarae Village in the southeast side of the island in the year 2000. Today this area has also been logged. A species was also sighted when a tree was felled in the forest in the hinterland of Mango Bay up the Mango River, on southeast Choiseul. And another giant rat, was caught and kept for a short while at Loloko Village on southeast Choiseul before it died. Therefore, these native rats are widely distributed throughout the island. However, in terms of abundance or population numbers, these results seem to indicate that they are more common near Olivetti Village, in the interior of northwest Choiseul, and becoming extremely rare.

Generally *Solomys ponceleti* is especially rare compared to *S. Salebrosus*. *Solomys ponceleti* are now found only in primary lowland rainforests and mostly in the interior of the island, where there is less disturbances and an abundance of food.

Summary of mammals

Table 2: Showing list of mammals and relative abundance of each mammal.

Site no.	Mammals	Relative abundance				Ethnobiological and habitat descriptions
		1 – 10	10 - 20	20 - 50	50 <	
1	<i>Emballonura</i>	X				Common in lowland

	<i>nigrescens</i>					forests, beside streams, open areas, and forest edge
All lowland sites	<i>Pteropus rayneri</i>	X				Common in primary and secondary forests. Also abundant in coconut plantations. A generalist.
11	<i>Emballonura nigrescens, Pteropus rayneri, Pteropus admiraltum, Rousettus amplexicaudatus, Dobsonia inermis</i>		X			The upper Kolombangara is abundance in bats and flying foxes. These are regularly hunted by students of Lauru Rural Training Centre.
15	<i>Pteralopex anceps</i>	X				Only found in high certain strangler fig roost sites on the slopes of Mt Maetambe.
15	<i>Rousettus amplexicaudatus</i>		X			Common along rivers, breaks in forest, rainforest.
15	<i>Dobsonia inermis</i>		X			Common along rivers, breaks in forest, rainforest.
15	<i>Melonycteris woodfordi</i>		X			Common along rivers, breaks in forest, rainforest.
16	<i>Solomys salebrosus, S. ponceleti</i>	X				Two individuals of the Bougainville Giant rats (<i>S. salebrosus</i>) were found in tall secondary and primary forests near Olivetti Village. Locals say Poncelet's Giant rat is also found here, although this species is not as common.

Habitat preference

Prior to this survey only one previous record of habitat preference of *Solomys* was obtained for Choiseul Island. According to Leary (1993) the preferred habitat of *S. ponceleti* was *Terminalia brassii* forests, in the interior of the island. Individuals of

Poncelet's Giant rat (*Solomys ponceleti*) were found in the high *Terminalia* forest behind Posarae Village.

As a result of this survey it was observed that native rats were mostly restricted to old growth forests where there is limited impact on to the rainforest. These species were also found in secondary forests and forest edges with few intrusions like the isolated inland village of Olivetti.

The forests of these particular sites are composed of ferns, lichens, fig trees, vines, tree seedlings and other native vegetation. In terms of habitat. Local informants, mainly hunters indicate that giant rats were mostly found in *Ficus variegata*, *Ficus benjamina* and *Ficus drupacea*. When the timber species *Vitex cofassus* and *Pometia pinnata* is felled these trees also yielded the presence of *Solomys*.

Metroxylon salomonense, *Canarium* spp, *Artocarpus altilis*, *Bruguiera gymnorrhiza*, *Terminalia* spp., and *Terminalia brassii* are common trees found in the lowland forests. Some of these trees such as *Canarium* spp., *Metroxylon salomonense*, are fruit or nut trees associated with human modifications in secondary forests. Other trees mentioned by local informants to be important habitats of *Solomys* include *Rhizophora* spp., *Erythrina variegata*, *Inocarpus fagifer*, *Pandanus* spp., *Octomeles sumatrana*, *Macaranga tanarius*, *Mangifera indica* and the unidentified native trees, **botere**, **guno**, and **papakeo**.

Summary of opportunistic frog's assessment during BP survey

An opportunistic survey of frogs was also carried out during the BP survey. In total there were a total of 15 frogs sighted and collected during the BP survey. Fourteen were native,

and one introduced species (*Brachylodes elegans*, *B. gigas*, *B. vertebralis*, *B. trossulus*, *B. wolfii*, *Ceratobatrachus guentheri*, *Platymantis guppyi*, *P. weberi*, *P. solomonis*, *Discodeles guppyi*, *D. buforniformis*, *Litoria thesaurensis*, *Rana krefftii*, *Palmatorapia solomonis*, *Bufo marinus*). (See Appendix 2 for photographs)

Opportunistic survey of frogs on Choiseul during BP Survey

Table 3

Site	GPS Coordinate	Date surveyed	Time/man/effort	Altitude	Major habitat	Species found
<u>Choiseul Island</u>						
Komoro		24/07/2005	19:30 – 21:00	0 – 100m	Lowland forest, <i>Casuarina</i> sp. pine forest, mixture of <i>Terminalia</i> trees, undergrowth dominated by palms, pandanas, and ferns. Leaf litter predominately <i>Casuarina</i> sp.	<i>B. elegans</i> , <i>C. guentheri</i> , <i>P. weberi</i> , <i>B.gigas</i> , <i>B. vertebralis</i> , <i>Boiga irregularis</i>
		25/07/2005	19:00 – 20:45	0 – 100m	(same as above)	<i>B. elegans</i> , <i>C. guentheri</i> , <i>P. weberi</i> , <i>B.gigas</i> , <i>B. vertebralis</i>
Komoro (Inland)		26/07/2005	No time recorded, but at least surveyed for an hour	100m	Pandanas, palms dominate understorey.	<i>B. gigas</i> , <i>B. vertebralis</i> , <i>B. elegans</i> , <i>P. solomonis</i> , <i>Platymantis guppyii</i> , <i>C. guentheri</i>
Robroy Island		27/07/2005	-	Sea - level	Coastal streams, palms, secondary forests	<i>Discodeles guppyii</i>
Boeboe		28/07/2005	-	Sea - level	Garden areas, grassland, degraded areas	<i>Platymantis solomonis</i> , <i>P. weberi</i>
Vurulata		29/07/2005	-	0 – 100m	Lowland forest dominate by	<i>Platymantis guppyii</i> , <i>P.</i>

					<i>Terminalia</i> trees, wild bananas, ferns, and palms	<i>solomonis</i> , <i>P. weberi</i> .
Koa Village		3/08/2005	-	Sea level	Village, village outlier, dominated by pineapple patch, coconuts, <i>Metroxylon salomonense</i>	<i>D. buforniformis</i> , <i>P. solomonis</i> , <i>P. weberi</i>
Gulasa, upper Vurulata River		4/08/2005	-	50 – 100m	Wild banana trees, ferns, Pandanus and figs dominate the understorey here.	<i>Platymantis solomonis</i> , <i>P. guppyi</i> , <i>Brachylodes vertebralis</i> , <i>Ceratobatrachus guentheri</i>
Gulasa, upper Vurulata River		6/08/2005	-	50 – 100m	Wild banana trees, ferns, Pandanus and figs dominate the understorey here.	<i>Brachylodes vertebralis</i> , <i>Ceratobatrachus guentheri</i> , <i>Platymantis guppyi</i>
Lomutu river, Kamaga hinterland	-	17/08/2005	0 – 50m	50 – 100m	<i>Heliconia</i> sp., wild bananas, ferns. Generally lowland.	<i>Platymantis solomonis</i> , <i>P. weberi</i> , <i>P. guppyi</i> , <i>Brachylodes vertebralis</i> , <i>Litoria thesaurensis</i> , <i>R. krefftii</i>
Kinoso (Lake)		19/08/2005	0 – 50m	0 – 50m	Near aquatic vegetation. Secondary forest.	<i>Litoria thesaurensis</i> ,
Kinoso (vge outlier)	S07°13.101' E156°56.309'	20/08/2005	19:00 – 21:00	0 – 50m	Coastal slope forest. Secondary forest dominated by gingers, <i>Canarium</i> trees.	<i>Platymantis solomonis</i> , <i>P. weberi</i> , <i>P. guppyi</i> , <i>Brachylodes vertebralis</i> , <i>B. elegans</i> , <i>Bufo marinus</i>
Kinoso (vge outlier)	S07°13.101' E156°56.309'	21/08/2005	19:30 – 22:00	0 – 50m	Coastal slope forest. Secondary forest dominated	<i>Platymantis solomonis</i> , <i>P. guppyi</i> ,

					by gingers, <i>Canarium</i> trees.	<i>Brachylodes vertebralis</i> ,
Lauru Rural Training Centre upper Kolombangara River	S06°59.060' E156°45.960'		19:30 – 22:30	0 – 100m	Rivers edge dominated by ferns, palms, <i>Terminalia brassii</i> forests.	<i>Platymantis guppyii</i>
Lauru Rural Training Centre upper Kolombangara River	S06°59.060' E156°45.960'		19:30 – 21:30	0 – 100m	Rivers edge dominated by ferns, palms, <i>Terminalia brassii</i> forests.	<i>Discodeles guppyii</i> , <i>D. Buforniformis</i> , <i>P. Weberi</i> , <i>P. Solomonis</i> , <i>C. Guentheri</i> , <i>Candoia bribroni</i>
Choiseul Bay			19:30 – 20:00	Sea level	<i>Terminalia brassii</i> forests, <i>Syzygium</i> trees	<i>P. solomonis</i> , <i>P. weberi</i>
Nuatabu hills			-	100 – 200m	Dominated by <i>Metroxylon salomonense</i> , secondary forests, and old village gardens	<i>P. solomonis</i> , <i>P. weberi</i> .
Sarelata hills			19:00 – 21:30	500 – 600m	Old overgrown gardens/village, understorey dominated by gingers, palms, <i>Areca</i> sp., <i>Syzygium</i> sp.	<i>Palmatorapia solomonis</i> , <i>Rana krefftii</i> , <i>P. solomonis</i> , <i>B. trossulus</i> , <i>B. elegans</i> , <i>B. vertebralis</i> .
Slopes of Mt Maetambe			19:30 – 21:30	800 – 1000m	Montane forests	<i>Brachylodes wolfii</i> , <i>P. guppyii</i> , <i>B. vertebralis</i>

Habitat

Forest type – lowland, *Casuarina* sp. forest.

Trees a mixture of *Terminalia* spp. undergrowth packed with *Pandanus* species and palm trees. Figs are abundant in the understory, with ferns near the ground level. Pine trees (*Casuarina* sp) grow inland, characteristic of the southeast part of Choiseul Island.

Leaf litter is predominantly of *Casuarina* sp., *Terminalia*, and *Pandanus*.

Stream site is mainly composed of *Pandanus* and figs. Frogs are abundant inland. Species include *Brachylodes elegans*, *B. gigas*, *B. vertebralis*, *Platymantis weberi* *P. guppyi*, *P. solomonis*, and *Ceratobatrachus guentheri*.

Platymantis guppyi species on Choiseul are comparatively bigger than other species I've seen on Gatokae, Vangunu and Tetepare Islands in the Western Province.

During the BP survey this species was shown to occupied tall *Pandanus* plants, and wild bananas. It is one of four frogs that are endemic to Solomon Islands.

Komoro on the southern tip of Choiseul Island is a sparsely populated region of the island. The Goragosele Passage runs the southeastern Choiseul tip between Robroy Island and Choiseul. A deep channel forested down to the waters edge. Large forest trees line both sides of the passage. Further south, forests are taken over by mangrove forests. Birds and bats are abundant here. *Pteropus* colonies are found in the mangrove forests, and lowland streams here.

Landscape – rolling hills, lowland forests, and small streams. No large rivers in the south eastern part of Choiseul. Except for Oaka River which is further up the coast, the Komoro area the tip of southeast Choiseul has no major freshwater river. A network of smaller streams drain into the sea here, making it more vulnerable to environmental changes such as logging, even natural factors, such as extended periods of no rainfall.

Summary of freshwater fish survey during BP survey

During a terrestrial biodiversity survey of Choiseul Island, we conducted freshwater fish surveys in seven sites between July 2005 and August 2006. We found 32 fish species from 15 families (38% of known Solomon Island freshwater fish). Most species were uncommon with the exception of *Kuhlia marginata* and *K. rupestris* which were found in six and five sites respectively. No introduced species were found in any of the sites. Species richness ranged from 2-14 species per site and was highest in Lumutu River and Kolombangara River. This difference between sites is partially attributed to substrate type (higher richness in sites with gravel substrates than mud) and distance from the coast (higher richness near the coast than inland). The results of this survey in conjunction with a previous survey bring the total number of freshwater fish species on Choiseul Island to 41. This diversity is threatened by habitat degradation through sedimentation and over harvesting of some species. We recommend a number of activities to ameliorate these threats including seasonal banning of fish harvest during breeding periods and mass juvenile migrations, discouraging the practice of streamside agriculture, and education of locals on the negative impacts of logging on watershed health and productivity.

Table 4

Site	Species found
<u>Choiseul Island</u>	
Sene Creek	<i>Giuris margaritacea</i> , and <i>Hypseleotris guentheri</i>
Lumutu River	<i>Caranx sexfasciatus</i> , <i>Glossogobius</i> sp 1., <i>Sicyopterus lagocephalus</i> , <i>Sicyopterus</i> sp. A, <i>Sicyopterus</i> sp. B, <i>Stiphodon rutilaureus</i> , <i>S.semoni</i> , <i>Kuhlia marginata</i> , <i>K. rupestris</i> , <i>Cestraeus plicatilis</i> , <i>Rhyacichthys aspro</i> , <i>Mesopristes argenteus</i> , <i>M. canulatus</i> , and <i>Terapon jarbua</i>
Vurulata River	<i>Apogon</i> sp., <i>Eleotris fusca</i> , <i>Hypseleotris guentheri</i> , <i>Glossogobius</i> sp 1., <i>Redigobius</i> sp. (bikolanus), <i>Sicyopterus lagocephalus</i> , <i>Stiphodon</i> sp 1., <i>Kuhlia marginata</i> , <i>K. rupestris</i> , <i>Lutjanus argentimaculatus</i> , <i>Monodactylus</i> sp., and <i>Micropis brachyurus brachyurus</i>
Kolobangara River	<i>Ambasis miops</i> , <i>Anguilla marmorata</i> , <i>Caranx sexfasciatus</i> , <i>Giuris margaritacea</i> , <i>Glossogobius</i> sp 1., <i>Redigobius</i> sp. (bikolanus), <i>Sicyopus atratus</i> , <i>Stiphodon rutilaureus</i> , <i>Kuhlia marginata</i> , <i>K. rupestris</i> , <i>Lutjanus argentimaculatus</i> , <i>Cestraeus plicatilis</i> , <i>Mesopristes argenteus</i> , and <i>M. canulatus</i>
Bisilata Creek	<i>Ambasis miops</i> , <i>Giuris margaritacea</i> , <i>Glossogobius</i> sp 1., <i>Stenogobius</i> sp 1., <i>Kuhlia marginata</i> , and <i>K. rupestris</i>
Sui River	<i>Ambasis miops</i> , <i>Glossogobius</i> sp 1., <i>Sicyopterus lagocephalus</i> , <i>Sicyopus mystax</i> , <i>Stiphodon birdsong</i> , <i>S. rutilaureus</i> , <i>Zenarchopterus dispar</i> , <i>Kuhlia marginata</i> , <i>Gymnothorax polyuranodon</i> , and <i>Mesopristes argenteus</i>
Manapapu River	<i>Sicyopus discordipinnis</i> , <i>Stiphodon rutilaureus</i> , <i>S. semoni</i> <i>Kuhlia marginata</i> , and <i>K. rupestris</i>

Table 5. Description and location of the seven freshwater fish survey sites on Choiseul Island.

Site/Physical Characters	Sene Creek	Lumutu River	Vurulata River	Kolobangara River	Bisilata Creek	Sui River	Manapagu River
Date surveyed	16/08/05	17/08/05	18/08/05	23-24/08/05	25/08/05	3/09/05	8/01/06
Width (m)	2 - 3	8 - 14	8 - 12	7 - 15	2 - 5	1.5 - 4	6 - 9
Depth (m)	0.1 -1	0.1 - 3	0.1 - 2.4	0.1- 3.2	0.1 - 1	0.1 - 2.2	0.1 - 1.2
Speed (m/s)	0.1	0.5 - 1	0.2 - 0.7	0.5 - 0.8	0.1 - 0.3	0.5 - 1.5	0.5 - 0.8
Location	Coastal	Coastal	Coastal	Coastal	Coastal	Coastal	Inland
Stream type and major habitat	Riparian plants along creek edge. Flows through lowland tropical rainforest	Riparian plants along river edge. Flows through a lowland tropical rainforest	Paragrass and ferns are the dominant riparian plants on the river edge	Paragrass and ferns are the dominant riparian plants on the river edge	Paragrass and ferns are the dominant riparian plants on the river edge	Sui River above Parasi Waterfall. Flows through garden and low land secondary forest	Riparian plants along river edge. Flows through primary tropical rainforest.
Major substrate type	Soft, muddy bottom	Boulders in the river with sand and gravel bottom	Muddy on the river edge with gravel and sand on river bottom	Muddy edge with gravel bottom	Soft, muddy bottom	Limestone rock with gravel bottom	Rocky river edge, boulders in the river with gravel bottom

Publications

Boseto, D, Morrison, C, Pikacha, P and Pita, T. In press. A preliminary survey of the freshwater fishes of Choiseul Island, Solomon Islands. *The South Pacific Journal of Natural Science*, University of the South Pacific, Suva, Fiji.

Morrison, C., Pikacha, P., Boseto, D., Pita, T., In press, *Frogs of Choiseul Island*, Solomon Islands, *Pacific Conservation Biology*.

Pikacha, P., Morrison, C., Boseto, D., Pita, T., darft, *Mammals of Choiseul Island*, Solomon Islands, *Pacific Conservation Biology*.

Note: There are two book publications that will be published as a result of this survey. (1) *Field Guide to the Frogs of Solomon Islands* (2) *The Rainforests of western Solomon Islands*.

Conclusion

Choiseul Island generally is has high biodiversity. On this trip our team was able to locate *Solomys ponceleti* and *S. salebrosus* only at one site which was the forests near Olivetti Village in the interior of western Choiseul. These animals are today extremely rare and are becoming even more threatened.

Opportunistic surveys were also conducted including freshwater and frog surveys at night. These surveys showed a high level of biodiversity in vertebrates on Choiseul. The results also showed that populations of species have been dwindling in recent years due to a number of factors, particularly deforestation through logging and to make way for agriculture, pollution of streams, and destruction of fruit and fig trees which mammals depend on.

In order to ensure that there is long – term conservation of *Solomys ponceleti* and *S. salebrosus* and many other species, there needs to be aggressive conservation efforts by conservation NGOs and practitioners and the government in collaboration with

community landowners to target specific areas of high biodiversity and intact forests on the island. There also needs to be a monitoring program to understand population trends and to discern what factors are impacting current population tendencies.