



For a living Solomon Islands

A Rapid Biodiversity Assessment of Barekasi Conservation Area, Vella Lavella, Western Province



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Acronyms

FPA - Forest Protected Area

HF - Hill Forest

LCCA - Leona Community Conservation Area

NRDF - Natural Resource Development Foundation

RBCA - Rainforest Biodiversity and
Conservation Area

TLR - Tropical Lowland Rainforest

WWF - World Wildlife Fund for Nature

Organizational Profiles

WORLD WILDLIFE FUND FOR NATURE - WESTERN MELANESIAN PROGRAM

WWF has been working on conservation issues in Papua New Guinea (PNG) and its surrounding islands for many years. In 2008 WWF's Pacific Office based in Fiji was divided in order to provide more effective coverage in this vast yet biologically important region. The newly formed 'Western Melanesian Program Office' based in PNG also encompasses the Solomon Islands.

WORLD WILDLIFE FUND FOR NATURE - SOLOMON ISLANDS

WWF has been working on conservation issues in Solomon Islands for many years. WWF Solomon Islands has a Sustainable Forestry Project that is funded by the European Union Sustainable Forestry and Conservation Project in Solomon Islands. Their effort in this project is to focus on conservation and sustainable forestry issues in the Solomon Islands.

MELANESIAN GEO - SOLOMON ISLANDS

Melanesian Geo is a new grassroots organization focused at educating local communities in Melanesia on the value of biodiversity conservation. MG is based in the Solomon Islands and in Fiji. This initiative combines a mixture of on the ground scientific research, backpack journalism, creative writing, and local - story telling in Melanesia.

NATURAL RESOURCE DEVELOPMENT FOUNDATION

Natural Resources Development Foundation Trust Board Incorporated (NRDF) is a Non-Government Organization (NGO) in the Solomon Islands, which started its activities in 2003. The Foundation's main aim is to support small-scale economic development at grass-root level (villages, communities, families), through the sustainable use of available natural resources.

The Foundation started its interventions as a reaction on the ongoing destructive logging of the rainforest areas in the Solomon Islands by Asian logging companies. NRDF wants to put a hold on these activities by supporting the landowners in starting alternative economic activities in their areas.

Report

The Solomon Islands is an area of amazing oceanic landscapes and rich biodiversity. The large islands of this double arc archipelago with diverse ecosystem settings have over time supported a corresponding array of faunal rich vertebrates.

The New Georgia group of islands in the Western Province of Solomon Islands is an extremely important area of faunal endemism. Vella Lavella island, the focus of this survey showed some remarkable fauna patterns, with anuran faunal attenuation towards Shortlands and Choiseul rather than the closer New Georgian islands. We surveyed one area in Vella Lavella, Leona Community Conservation Area. This is a lowland forest area dominated by a couple of valleys, the main one being centre of the Leona river. Ridges on both sides of the river valley rise to a couple of hundred meters above sea level dissected by small streams that eventually flow into the main Leona river artery.

The focus of this study was mainly on the frog fauna, with opportunistic surveys of birds, mammals and reptiles. A botanical description of the site was compiled by Myknee Sirikolo of WWF. Collectively this report presents a preliminary summary of the fauna and habitat characteristics of this part of Vella Lavella island.

Initial results indicate an amazingly intact lowland rainforest, relatively close to coastal villages, high in faunal diversity, and a large freshwater system catchment. These results show some interesting indications

INTRODUCTION

The New Georgian islands

The New Georgia group of islands in the Western Province of Solomon Islands are composed of 7 main islands, Vella Lavella, Ranongga, Kolombangara, New Georgia, Rendova, Tetepare and Gatokae. Collectively they total a land area of 5060km² with bearings northwest for 235km, forming a section of the Solomon Islands arc that is nearest to the Woodlark spreading ridge (Mann et al. 1998).

The highest peaks on 3 islands, Kolombangara, Rendova and Vangunu are more than 1000m asl, are composed of high montane forests. The others range from 300m to 885m asl. A diverse range of ecosystems are found on all islands, including saline swamp forests, coastal forests, mangrove forests, lowland forests, hill or ridge forests, and montane cloud forests (Bennett, 2000; Pikacha, 2008). Today large tracts of lowland rainforests around the New Georgian islands have been converted to agricultural landscapes such as gardens, small holder palm oil plantations, and tree plantations. As Asian logging companies swath

through the remaining pockets of rainforests, the remaining corridor of lowland rainforest connecting lowland and highland forests are under severe threat.

This island group has a history of volcanic eruptions and geologic disturbance.

Of the New Georgian islands, a few have not been surveyed extensively and only recently have scientists entered these islands to

Vella Lavella

Vella Lavella lies to the west of Gizo island, southwest of Kolombangara and north of Ranongga island. The island has a total land area of 670km², and is dominated by lowland rainforest. Highest point on the island is Mt. Tambisila Hill (790m asl), located to the north of the island. The lush south side is buffered by coastal forests, lowland and hilly forests. Vella Logging has devastated large areas on Vella Lavella and together with Vangunu, have

Leona Community Conservation Area

Leona Community Conservation Area (LCCA) is perhaps the last stand of lowland rainforest left on Vella Lavella island. Most of the extensive large tracts of lowland rainforests of Vella Lavella have been felled by logging companies.

The traditional landowners of LCCA live in Leona village, and have historically been in conflict with large industrial logging companies to keep this patch of pristine rainforest. It has only recently been established, but not legally recognized as a protected area.

Access to LCCA is by foot, as there is no truck road into the actual conservation area.

There are a few trails to the conservation hut.

The most accessible begins from the back of Leona village, and the cultivated gardens that extend beyond the village boundary. Another trail starts from a bay beyond the western end of Leona Village. An old logging pond, now overgrown, marks the start of the access road, leading to a logging road. There is a slight steep incline as one begins to climb up the logging road, before reaching the ridge line. The old

logging road winds along the ridge before a steep descent into the Leona river. Crossing the river, the bush track then winds along the river, regularly crossing the river to pick up the trail on the opposite bank.

Habitats

Aquatic habitats along the Leona river dominate the valley. Small streams drain into the river from both sides of the bank, some seasonal and only full after a rainstorm.

The entrance to the conservation area is protected by a forest management buffer zone. Typical of most lowland rainforests in the Solomon Islands, large stands of *Terminalia*, and other tropical hardwood trees dominate the valley. There is obviously evidence of human occupation with some secondary growth along the river and up on the ridges above the conservation hut.

MATERIALS AND METHODS

A number of standard inventory methods were used over the course of the survey.

Birds and bats

Birds and bats were mist-netted with the use of fine mist-nets. Only six nets were used during this survey between 27-30 October, 2009. The nets were placed at strategic locations within the rainforest in an effort to cover as much of the landscape as possible. Hence, the nets were placed along a river bank, in palm forests, in thick understorey forests, at forest edges and in relatively open understorey areas. But again 6 nets showed to be certainly inadequate to account for the avifaunal and bat diversity of LCCA forests.

Early morning and evening observations were made with binoculars. We (MS and PP) strolled along the Leona river, along trails beside the river, up the ridge behind the conservation hut and along the trail head to the upper reaches of the Leona river observing and counting birds.

Frogs and reptiles

Visual encounter surveys (VES) during late evening and early mornings were used to survey for frogs. We (PP & MS and rangers of LCCA) walked along the trail from the conservation hut up the river on the first night. On the second night we walked down the trail leading towards Leona. Opportunistic surveys were done along the trail and by walking on a random tangent into the forest for at least 20 to 30m's.

Frogs were identified by call and by sight. An Olympus digital WS-510M voice recorder was used during the course of the survey to capture frog calls. Each call was then cleaned and amplified using the software Adobe Audition 1.5. Acoustic calls were then placed as signature calls for recognition of each species on Vella Lavella. Acoustic signals of each species of known frogs in the Solomons are being recorded by PP with the intention of compiling an accompanying CD of frog calls of Solomon Islands to the *Frogs of the Solomon Islands* book.

Reptiles were opportunistically surveyed at night and during the day. Skinks especially as they came out to sun themselves in the morning would be found resting on open logs.

Habitat and botanical descriptions

Habitat descriptions were done by walking through the forest along the trail and identifying plant species. MS surveyed a number different areas in LCCA. These included the river valley, the adjacent forests, the ridge summit behind the conservation lodge.

STUDY SITE

General site

Leona Community Conservation Area (LCCA) is lowland rainforest in the foothills behind Leona village. It is lowland rainforest connected to coastal forests, and garden flat lands along the river flood plains of the lower Leona River, and ridge and hill forest on the high ridges on both

sides of the river valley.

The upper river valley is dominated by high stands of *Terminalia brassi* trees which grow along the river bank. *Heliconia* and *Alpinia* plants line the banks of the river and in some sections dominate the forests along the river bank.

The LCCA itself has no effective disturbance and is natural, except for evidence of historical human occupation. Lawyer canes are sparse in the understorey and tend to grow in areas where a tree has fallen or where there is a gap in the canopy. Fallen logs are sparse and leaf litter in the primary forest is thin, and the soil which is sandy clay is relatively moist.

Palm forests grow in deep valleys which dissect the ridge leading to the Leona river. The soil is mostly flat sandy soil, especially along the river banks, with 60% canopy cover in the canopy and about 50% canopy cover in the understorey in primary rainforests.

Barekasi Forest Conservation Area

The Barekasi FCA is located in the upper catchments of Leona village on Northwest Vella Lavella Island. It is about two hours average walking distance from the coast to the entrance of the FCA inland. The main Leona river flows right through the FCA down to the west end of Leona village.

The Barekasi rainforest is wet and very rich in plant biodiversity due to several different local forest habitats that are existing throughout the proposed FCA. Freshwater swamp vegetation, lowland forest, uphill forest and secondary forests are randomly distributed within the FCA study sites. It was noted that the FCA boundaries are clearly marked by typical natural features such as streams, ridges and cascading gullies. Old abandoned human settlements are preserved and decorated with important fruit and nut trees such as *Canarium indicum* (Ngali nut), *Canarium salomonense* (small Ngali nut), *Inocarpus fagifer* (Chest nut), *Barringtonia edulis* (Cut nut, vele), *Areca catechu* (betel nut, kasu), *Metroxylon solomonense* (sago palm), *Syzygium*

malaccensis (Local apple) and important timber trees like *Pometia pinnata*, *Vitex cofassus*, *Terminalia brassii*, *Terminalia calamansanai*, *Syzygium* species and *Dysoxylum* species.

DESCRIPTION OF FOREST TYPES AND HABITAT REQUIREMENTS

Primary lowland and secondary forests

Primary forests are forests that have no or limited histories of disturbance in terms of the forest being cleared or felled to make way for gardens. Impacts otherwise in primary forests may come from feral pigs, cats, dogs and rats. Most are anthropogenic introductions but sometimes with devastating impacts on the flora and fauna of islands.

Secondary habitats are forests with histories of human clearing, but where the forests have regenerated. These forests are hence dominated by regrowth vegetation and trees such as *Pometia pinnata*, *Calophyllum* sp, and *Ficus* sp. The buffer zone before LCCA is mostly secondary forests and below that are garden areas.

Quite often these forests are perceived as unproductive wastelands, however, surprisingly in the Solomon Islands these can be areas of high biodiversity. With seeding and fruit trees being more abundant some birds tend to prefer these more open sites.

Riverine habitats

Riverine habitats exist along streams and rivers.

These are dominated by aquatic plants, and ferns that hang over the edge, sometimes their branches and leaves dropping in the water.

These are also varied habitats, whose diversity depends on a number of factors, geology, landform, stream flow, topography, and elevation. Riverine habitats dominate the base of the upper Leona River valley.

The riverine forest habitats found within the Berekasi FCA is found to be greatly intact.

There is either very minimal or non-existing disturbances to the vegetation belt that surrounds both areas along the Leona river and

stream banks. Primary forest trees (*Pometia pinnata*, *Vitex cofassus*, *Terminalia brassii*, *Terminalia calamansanai*, *Alstonia scholaris*, *Alstonia spectabilis*, *Dysoxylum* species, *Octomeles sumatrana*, and many others are common here. Shrubs, herbaceous plants, terrestrial and epiphytic ferns and orchids, endemic ant plants (*Myrmecodia solomonensis* – Rubiaceae), climbers and creepers are widespread. Native but very ornamental palms such as the *Caryota rumphiana* (fishtail palm), *Drymophloeus salomonense*, *Ptychosperma latius*, *Ptychosperma salomonense*, *Rhopaloblaste elegans*, *Areca macrocalyx*, *Calamus holbrungii* all add thickness and dark green forest colouring to this unique lowland, near river forest habitats. It was observed that the Riverine forests distribution within the designated FCA is quite extensive. They cover a large terrestrial area and help to keep and maintain the level and continuous flow of water. Other flora and fauna appear to be dependent entirely on this habitats for their existence and natural processes.

RESULTS

Environment Variables

During the course of the two day survey in LCCA we experienced variable weather. The day we hiked into the conservation area it was clear with light showers in the afternoon.

Daytime and night time temperatures were recorded with a max-min thermo hygro Envirolite digital thermometer. Average day time temperature was 29^o C and night time temperatures 26.95^o C. Minimum temperature was around 25^o C. LCCA is a very wet part of the island. The temperature in the valley is influenced by rainfall and the prevailing southeasterly winds. Canopy light during the day time was sparse with light sporadically filtering in to the forest floor, influenced by cloud cover.

There was no wind in the evenings, just before we went spotlighting, but a light drizzle on the first night.

Table 1.0: List of bird species observed in the Leona Community Conservation Area, Vella Lavella, 18 – Oct, 2009.

Latin Name	Common Name	Status	Conservation status	Observation notes
<i>Aceros plicatus</i>	Blyth's hornbill	Native	Least Concern	Hunts in pairs, where couples bond for life. Common mostly in primary forests and forest edges.
<i>Anas superciliosa</i>	Pacific black duck	Native	Least Concern	Common along waterways
<i>Aplonis grandis</i>	Brown winged stirling	Endemic	Least Concern	Open areas, and forest edges
<i>Cacatua ducorpsi</i>	Solomons cuckatoo	Native	Least Concern	Coconut plantations, secondary and primary forests
<i>Chalcophaps steffani</i>	Emerald-winged ground dove	Native	Least Concern	Mostly in primary forests, and <i>Canarium</i> nut groves
<i>Centropus milo</i>	Bu -headed coucal	Native	Least Concern	Open areas, forest understorey, sometimes village outliers and forest edges
<i>Chalcopsitta cardinalis</i>	Cardinal lory	Native	Least Concern	Common in coconut plantations, open areas, secondary forests and primary forests
<i>Dracula rubricera</i>	Red-knobbed fruit pigeon	Native	Least Concern	Mostly in primary forest. Seen feeding in canopy
<i>Ducula pacifica</i>	Pacific imperial pigeon	Native	Least Concern	Mostly in coastal and lowland forests
<i>Eeclctus roratus</i>	Solomon eeclctus parrot	Native	Least Concern	Mostly in coastal and lowland forests
<i>Haliatus sanfordi</i>	Solomon sea eagle or Sanford's sea eagle	Endemic		Upper Leona River Valley
<i>Monarcha barbatus</i>	Black and white monarch	Native	Least Concern	Lowland forest
<i>Monarcha richardsii</i>	White napped monarch	Native	Least Concern	Secondary and primary lowland forest
<i>Megapodius freycinet</i>	Common scrub fowl	Native	Least Concern	Lowland forest
<i>Myiagra ferrocyanea</i>	Steel-blue flycatcher	Native	Least Concern	Lowland forest
<i>Pachycephala pectoralis</i>	Golden whistler	Native	Least Concern	Primary lowland forest
<i>Ptilinopus solomonensis</i>	Yellow breasted fruit dove	Endemic	Least Concern	Primary lowland forest
<i>Ptilinopus viridens</i>	Red-breasted fruit dove	Native	Least Concern	Secondary and primary lowland forest
<i>Reinwardtoena crissirostris</i>	Crested cuckoo dove	Native		Ridgetops and mountains
<i>Rhipidura rufifrons</i>	Rufous-fronted fantail	Native	Least Concern	Open areas, river valley, secondary forest, villages
<i>Trichoglossus haematodus</i>	Rainbow lorikeet	Native	Least Concern	Coconut plantations, secondary and primary lowland forest
<i>Zosterops vellalavellae</i>	Vella Lavella white eye or Banded white -eye	Endemic		Observed feeding on seeding trees overhanging river

* Denotes species listed as threatened under IUCN (2007)

Birds

LCCA is rich in bird diversity. The river valley especially comes alive early in the mornings with endemic white eyes (*Zosterops*) feeding on seeding trees beside the Leona River.

Noisy hornbills are obvious, making loud flapping sounds with their wings. Pigeons are also abundant mostly occupying tall canopy trees.

A list of birds observed during the course of two days is listed in table 1.0. This is an underestimate owing to insufficient time and equipment in the field. We only used 6 mist nets.

Species Diversity and Abundance

Twenty two species of birds were recorded during the course of this survey (Table 1.0). These were mostly common birds found throughout the New Georgian islands with some exception; the Vella Lavella white eye (*Zosterops vellalavellae*) which is endemic to Vella Lavella.

Monarchs seemed to be more common on the ridges than in the valley. None were seen or heard in the river valley.

Common parrots were cardinal lorries (*Chalcopsitta cardinalis*), rainbow lorikeets (*Trichoglossus haematodus*), and Solomons cockatoo's (*Solomons cuckatoo*). We did not hear or see any song parrots, which was surprising.

A fledgling endemic yellow breasted fruit

dove (*Ptilinopus solomonensis*) was found on the river bank. It had fallen out of its nest which was high up in a *Terminalia brassi* tree.

Vella Lavella white eye (*Zosterops vellalavellae*) seemed to be common along the upper Leona River. It was observed feeding on seeding trees growing over the river.

Brown winged stirling (*Aplonis grandis*) an endemic to Solomon Islands was seen in lowland primary forests on the ridge behind the LCCA conservation hut. These are usually birds of open areas, secondary forests and village outliers. On this occasion it was sighted in primary lowland ridge forest.

A juvenile endemic Solomon sea eagle (*Haliastur sanfordi*) was seen in the upper Leona River. The bird was observed holding a captured giant prehensile tail skink (*Corucia zebrata*) in its claw. We observed this up close for at least 15 to 20 minutes at close range between 10m to 15m, before the bird flew off. This was the first time this behaviour had been observed up close, of perhaps the world's most restricted bird of prey capturing the world's largest restricted range arboreal skink. Other observational notes, and our examination is now subject of a scientific publication by Pikacha et al.

At least 15 percent of the birds of LCCA are endemic to the Solomon Islands. The main Leona River Valley and adjacent forests seemed to hold most diversity. Fruit trees and flowering

Table 2.0: List of mammals species observed in the Leona Community Conservation Area, Vella Lavella, 18 – Oct, 2009.

Latin Name	Common Name	Status	Conservation status	Observation notes
<i>Phalanger orientalis</i>	Northern common cuscus	Prehistoric introduction		
<i>Pteropus rayneri</i>		Endemic		Abundant ground frog
<i>Hipposideros diadema</i>	Diadem Horseshoe-bat	Endemic		Abundant in understorey trees and palm forests
<i>Sos scrofa</i>	Feral pig	Prehistoric introduction		Abundant in understorey trees and palm forests

* Denotes species listed as threatened under IUCN (2007)

plants with nectar were found abundant in these lowland forests and may be the reason for this concentration.

Mammals

The mammals of LCCA are under surveyed in this effort. Intensive survey methods would use cage traps and spotlighting for small mammals, and mist nets and harp traps for bats. This would most likely yield more species counts. Thorough surveys would also require more field time.

There were only four mammals recorded in this survey (Table 2.0). Two prehistoric introductions, northern common cuscus (*Phalanger orientalis*), and feral pigs (*Sus scrofa*), and two bats, Solomons fruit bat (*Pteropus rayneri*) and Diadem Horseshoe bat (*Hipposideros diadema*) were observed in this survey. Solomon's fruit bat was seen flying overhead. It's large built, and reddish orange neck and back makes it easy to pick out.

Species Diversity and Abundance

The LCCA is a hunting ground for villagers of Leona Village. According to locals feral pigs are common in lowland forests. Although we did not spot the northern common cuscus (*Phalanger orientalis*), there was a strong scent given off by this marsupial on the slope behind the conservation hut. Northern common cuscus is the most abundant of small mammals in the Solomon Islands. These can be found in secondary, primary and ridge forests.

Only three bats, Solomon fruit bat (*Pteropus rayneri*), Diadem Horseshoe bat (*Hipposideros diadema*), Northern blossom bat (*Macroglossus minimus*) observed in this survey. This accounts for a mere 20 percent of the total bat count on Vella Lavella. The latter is the second largest horseshoe bat in the region, and is extremely widespread throughout western Melanesia. This bat roosts in caves. We only caught one specimen in a mist net near the conservation hut.

Herpetofauna

The herpetofaunal diversity of LCCA is very

diverse. Again this listing does not do justice to the diversity, because of poor sampling effort, and time constraints.

Still our observations included at least 8 species of frogs and 3 skinks and 1 snake, Solomons coral snake (*Salomonelaps par*). Two individuals of Solomons coral snake was seen in forests beside the river bank. This forest was high in *Batrachylodes elegans* frogs as well, which is a favourite prey of the snake.

With more field time, the brown tree snake (*Boiga irregularis*), the Pacific boa, and other snakes would have been encountered. These were previously identified on Vella Lavella by McCoy.

One interesting observation was a calling Solomon palm frog (*Palmatorrapia solomonis*) on the final night of the survey. PP heard them calling off the trail before the conservation hut, and in very low densities.

Solomon palm frogs have been previously seen and photographed on Vella Lavella by Dr Chris Filardi of the American Museum of Natural History (pers comm). These have not been seen nor heard on any other New Georgian island, even in montane or remote ridge forests. Which beckons the question whether this particular fauna on Vella Lavella has a closer affinity with Choiseul and Shortlands rather than the New Georgian islands.

Density estimates and effort

Density estimates for frogs were done by running 100m transects along randomly selected sites. Species were both identified by call and by sight and recorded on a data sheet. The results were then entered into DISTANCE software, which then generated a density estimate for each species in the 4 transects (table 4). This allowed us to compare density estimates between each species.

A total of 218 minutes was spent on the 4 transect lines. Most of the time opportunistic surveys were done of the forests within the LCCA.

Activity patterns of frogs was significant in determining density estimates. Most were active around dusk and between 19:00 and 21:00.

Activity markedly reduced after 21:00 and picked up again in the early mornings, around 4am, etc.

Species Diversity and Abundance

There is an underestimate of the herpetofauna in LCCA. We sighted about 40 percent of the total frogs recorded in the Solomon Islands. The most abundant ground frog was *Ceratobatrachus guentheri* and *Platymantis weberi* and the most

abundant tree dwelling species *Batrachylodes elegans* and *Platymantis guppyi*. All species were found in relatively high numbers in all forest types.

Palmatorrapia solomonis

This species was heard in lowland forest before the conservation hut. *Palmatorrapia solomonis* is a rare species, currently listed as vulnerable on the IUCN redlist. It has not been found on the other

Table 3.0: List of herpetofauna species observed in the Leona Community Conservation Area, Vella Lavella, 18 – Oct, 2009.

Latin Name	Common Name	Status	Conservation status	Observation notes
Frogs				
<i>Palmatorrapia solomonis</i>	Solomon Islands palm frog *	Endemic	Vulnerable	Heard calling in relative low densities before the LCCA conservation hut.
<i>Platymantis weberi</i>	Weber's Wrinkled Ground Frog	Endemic	Least Concern	Abundant ground frog
<i>Platymantis guppyi</i>	Solomon Islands Giant Treefrog	Endemic	Least Concern	Abundant in understorey trees and palm forests
<i>Batrachylodes elegans</i>	Elegant Sticky-toed Frog	Native	Least Concern	Abundant in understorey trees and palm forests
<i>Ceratobatrachus guentheri</i>	Solomon Islands Eyelash Frog	Native	Least Concern	Abundant mostly in primary forest
<i>Discodeles guppyi</i>	Giant Webbed Frog	Native	Least Concern	Juveniles were caught in upper Leona stream. Common along fast flowing streams and steep ledges.
<i>Discodeles opisthodon</i> ?	Fauro Island Webbed Frog	Native	Data Deficient	Could have been calling in swampy forest before the LCCA conservation hut
<i>Discodeles malukuna</i>	Malukuna Webbed Frog	Native	Data Deficient	Calling in dry river beds and swampy areas before LCCA conservation hut
Reptiles				
<i>Salomonelaps par</i>	Solomon red krait	Endemic	Least Concern	Observed beside river, in palm forests. These snakes frequently feed on <i>Batrachylodes elegans</i> .
<i>Corucia zebrata</i>	Prehensile tailed skink**	Endemic	Least Concern	Observed in river valley. Caught by sea eagle.
<i>Emoia caeruleocauda</i>	Pacific blue-tailed skink	Native	Least Concern	Around conservation hut
<i>Boiga irregularis</i>	Brown tree snake	Native	Least Concern	In conservation hut thatch.

* Denotes species listed as Vulnerable under IUCN (2007)

** Denotes a species that has been hunted and exported in the pet trade. Populations in some areas have been dramatically reduced.

Table 4.0: Summary of variables and frog densities per 100 meter line transects along randomly selected sites at LCCA.

Date	Site	Site coordinate	Elevation	Daytime air temp (°C)	Nighttime air temp (°C)	Landform pattern	% Canopy crown cover	% Understorey cover	Vegetation type	Level of disturbance	Soil moisture	Logs	Shrub	Canopy light	Moonlight	Weather	Time at start	Time at end	Total time/ mins	<i>Palmatorrapia solomonis</i> (density no/ha)	<i>Platymantis weberi</i> (density no/ha)	<i>Platymantis guppyi</i> (density no/ha)	<i>Platymantis solomonis</i> (density no/ha)	<i>Ceratobatrachus guentheri</i> (density no/ha)	<i>Batrachylodes elegans</i> (density no/ha)	<i>Discodeles guppyi</i> (density no/ha)	<i>Discodeles malukuna</i> (density no/ha)
27/10/09	LCCA	S07°42.237'; E156°34.272'	119	29	27.9	Flat alluvial soil	60	50	Lowland forest	No effective disturbance, natural	Very moist	Sparse	Dense	Sparse	Dim	Drizzle	19:20	20:13	53	None	7.3122	18.583	14.168	14.375	33.316	None	None
27/10/09	LCCA	S07°42.260'; E156°34.239'	104	29	25.9	Flat alluvial soil	60	50	Lowland forest	No effective disturbance, natural	Very moist	Sparse	Dense	Sparse	Dim	Drizzle	20:15	21:00	45	None	7.7668	12.502	None	15.000	25.003	None	None
28/10/09	LCCA	S07°42.318'; E156°34.167'	107	29	27	Flat alluvial soil	60	50	Lowland forest	No effective disturbance, natural	Very moist	Sparse	Dense	Sparse	Dim	No Rain	19:15	20:20	65	3.0769	9.009	11.501	None	14.502	16.502	None	3.337
28/10/09	LCCA	S07°42.196'; E156°34.358'	103	29	27	Flat alluvial soil	60	50	Lowland forest	No effective disturbance, natural	Very moist	Sparse	Dense	Sparse	Dim	No Rain	20:25	21:20	55	None	9.506	13.001	None	13.335	35.004	5.005	None

New Georgian islands. Further comprehensive survey searches could change this.

At LCCA *Pal. solomonis* was only sighted in transect 3 and in very low densities. They were calling in dense lowland forest about 20m off the main track. None were heard near the trail or in sparse understorey.

Platymantis weberi

This is an abundant species in lowland rainforests. *P. weberi* was sighted in all 4 transects within LCCA, and in relatively high densities.

There was no biasedness in densities of *P. weberi* in terms of its presence in LCCA. For instance, the species was found in open areas, cleared areas around the conservation hut, on the trail, near the river's edge, and in dense primary forest. *P. weberi* is a forest generalist.

Platymantis guppyi

There was relative high density of *Platymantis guppyi* in LCCA, due to a number of possible reasons. Understorey trees and vegetation is more dense, and provides a more habitat diversity for this large tree frog. *P. guppyi* also were more active calling just after a rain shower, compared to drier spells. In all transects, *P. guppyi* showed rather high densities compared to other *Platymantis* frogs.

Skinks were mostly common in open areas and along the river bank and trail. We only recorded 3 species in this short survey.

Platymantis solomonis

A common ground frog, this species was only recorded in one transect, yet in relatively high density. It lives in sympatric relationship with *Platymantis weberi*. Both species can be found in high densities in lowland rainforests, and in all habitats in the forest. Preferring dark wet areas in the forest, but generally avoiding pools and puddles.

This is a direct developer, placing its eggs on the ground. The froglets hop out of the egg once it has hatched.

Ceratobatrachus guentheri

Solomon's horn frog was the most abundant ground frog in the forest protected area (FPA). Densities of *C. guentheri* were high in all transects. Opportunistic surveys in all other habitats within the LCCA also showed a presence of *C. guentheri*. Calling frogs were abundant in the forests in the valley as opposed to the slopes and ridges. The frogs also avoided pools and stagnant water ponds, preferring drier areas of the forest, dead woody areas, and more sheltered protected areas. They also found in open areas, sometimes on .

Batrachylodes elegans

This is quite a common frog. It is a tree frog found on small shrubs and trees. This species was seen in abundance in LCCA. Preferring old sheltered spots in the forest, they are also found in secondary forests on other islands within the New Georgian islands. *Batrachylodes elegans* occupy the range between 0.5 to 1.5m in forest trees. Above 1.5m it is often taken over by *B. vertebralis*.

Discodeles guppyi

A large water frog, it is found in fast flowing clean streams. Young individuals of *Discodeles guppyi* were caught in the upper reaches of the Leona River. A large individual was previously seen by locals perched on the side of a rock wall behind a waterfall. *Discodeles guppyi* is a good climber, and with its webbed feet able to scale steep ledges, where they hide in small caverns within steep gallery gorges. This species prefers fast flowing streams, and especially clean rivers.

On Tetepare and Gatokae, they are found deep in caves. Whilst on all islands where this species has been sighted, observations show that their densities are indubitably influenced by certain environmental variables and habitat arrangements which include; the presence of flowing clean streams, drooping vegetation cover over the river bank, steep ledges with nooks and crannies which provide niche space to shelter

and retreat when threatened, and primary forest or old growth secondary forest cover.

Discodeles malukuna

The smallest of the *Discodeles* sp., this is an endemic species to the Solomon Islands. It is mostly extant in rainforest habitats, on damp ground, and is not often found near stream edges as *D. guppyi* and *D. bufoniformis* are. These frogs were found at LCCA within palm forests in a valley bordered by the main track to the west and a steep slope to the east. *D. malakuna* is generally abundant in lowland forests, than ridge or submontane forests.

On Rendova they were especially common along the track to Ughele dam in overgrown secondary forest at 300m. Several individuals were encountered on the track, and numerous individuals were calling on the slopes and lowland ridge to the west and valley to the east of the track. On steeper ridge forests like Professors Camp, 1050m asl (Kolombangara) and Malukuna Village, 700m asl (Guadalcanal), *D. malakuna* preferred dry stream beds and to adjacent forest.

DISCUSSION

The forests of Leona Community Conservation Area are extremely high in vertebrate diversity.

The avifauna of the area is high in Solomon endemics.

Extended searches would result in considerable additions to the current lists in this report. Yet this brief two day visit, resulted in identifying some key species such as *Palmatorrapia solomonis*, which results have shown to occupy only older overgrown secondary forests and primary forests. Other species of significant discovery are relatively high populations of Vella Lavella white eye otherwise known as Banded White-eye (*Zosterops vellalavella*). These birds were abundant along the Leona stream corridor near the Conservation hut, but were not seen further upstream.

A first close up observation of the predator behavior of the Solomon sea eagle (*Haliaeetus sanfordi*) was done in the upper Leona River. Here we witnessed the large bird of prey capture an endemic prehensile tail skink (*Corucia zebrata*). This and other earlier observations are being compiled and reviewed for a possible publication in 2010.

CONCLUSIONS

The Leona Community Conservation Area is a region with intact ecosystems, supporting a thriving lowland rainforest community. There is high biodiversity here, with a richness tending towards Choiseul and Shortlands as opposed to the closer New Georgian islands.

Yet realistically these forests are extremely vulnerable, with threats coming from logging pressures.

Realising these high biodiversity values, it is necessary to increase our knowledge of the functions each species contribute to the overall equilibrium of the rainforest. By training local guides and forest rangers increase

RECOMMENDATIONS

- Carry out longer more extensive surveys of birds, mammals and frogs within the boundaries of LCCA.
- Small mammal survey concentrating on search for endemic giant rats, using a number of trapping methodologies.
- A boundary mapping exercise defining the boundaries of the conservation area.
- Training of local landowners in basic taxonomy and vertebrate survey techniques.

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Map 1: Map of Solomon Islands with square box to show Vella Lavella island.



1. Flower of ground orchid - *Goodyera* sp. (Orchidaceae)



2. *Terminalia brassi* forest in the upper Leona River, and within the Leona Community Conservation Area (LCCA).



3. Rainforest floor herb - *Cucurma longa* (Zingiberaceae)



4. Typical root system of *Syzygium decipiens* in lowland rainforest



5. Maisao river (upper Leona village) within the forest protected area.



6. *Homalomena cordata* (Araceae) - a common rainforest herb with its unique inflorescens.



7. Seed pod of a rare *Sterculia* sp. opened to show black seeds inside.



8. Flowers of *Pseuderanthemum bicolor* - an unique and rare rainforest shrub



9. Seed pods of the ground orchid *Calanthe chrysantha* - growing on tree stumps and forest floor within the FPA.



10. *Ptychosperma salomonense* and *Areca macrocalyx* are two common palms dominating the rainforest understory.



11. *Tapeinochilus salomonense* (Zingiberaceae) - an endemic and very rare herbaceous plant only found in few islands of the Solomons discovered in the FPA.



12. *Spathiphyllum solomonense* (Araceae) - An endemic and rare herbaceous plant only found in few places in SI, found to be quite common within the FPA.



Batrachylodes elegans, a common frog of the forest understorey. This species was more common in LCCA in primary rainforests as opposed to the buffer zone or more open areas. They are however found in secondary forests as well, preferring areas with moisture and cover. No were heard calling around Leona village, or the village outlier. It is like that more than one species of *Batrachylodes* is found at LCCA.



Platymantis guppyi, is a frog of the forest canopy. They were common around the conservation hut, and in palm forests. Some were heard as high as 10m in the understorey trees. This is also a very variable species, in terms of colour morph, and size. The individual species found on Vella Lavella seem to be larger than their cousins in the other New Georgian islands like Gatokae.



Pacific Blue-tailed skink (*Emoia caeruleocauda*), this is a widespread species in the Pacific, occurring from sea level to above 1000m asl. This skink is mostly terrestrial, and at Barekasi FPA we observed it on the ground as well as climbing over felled tree logs. The two golden dorsolateral stripes that begin from the snout along the body to the tail, and join to form a bright blue tail are clearly distinguish this species. In the closed forest, this was amongst the most common species.

Pacific Blue-tailed skink (*Emoia caeruleocauda*)



Pacific Blue-tailed skink (*Emoia caeruleocauda*)

Corucia zebrata, in the upper Leona River valley. This species was caught by the endemic Solomon sea eagle. It is likely a much sort after prey of the Solomon sea eagle. Prehensile tail skinks are the largest arboreal skinks in the world and found on almost all the islands of the Solomon Islands. Recent studies are attempting to separate the north species from the eastern and central species. Individuals of New Georgia are mostly uniform in colour, being light green/yellowish in colour, and smaller than those of Choiseul.



Stephans ground dove (*Chalcophaps stephani*) caught in lowland forest near the conservation hut. is a common bird of nut groves and forest undergrowth.



The endemic Solomon sea eagle (*Haliaeetus sandfordi*) is probably the most restricted range bird of prey in the world. This individual was observed with a captured endemic giant skink (*Corucia zebrata*) in its claw (below).



Juevile Golden whistler (*Pachycelphalus pectoralis*), was common around the Leona River valley.



Ceyx lepidus, a common bird along the Leona River and it's adjacent forest.

This Report and Field Effort was Compiled by;

