



## **A Rapid Assessment of the Amphibians and Reptiles of the Kwamalasamutu Region (Kutari/Lower Sipaliwini Rivers), Suriname**

Authors: Ouboter, Paul E., Jairam, Rawien, and Kasanpawiro, Cindarella

Source: A Rapid Biological Assessment of the Kwamalasamutu region, Southwestern Suriname: 124

Published By: Conservation International

URL: <https://doi.org/10.1896/054.063.0112>

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## Chapter 9

### A rapid assessment of the amphibians and reptiles of the Kwamalasamutu region (Kutari/lower Sipaliwini Rivers), Suriname

Paul E. Ouboter, Rawien Jairam, and  
Cindyrella Kasanpawiro

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#### SUMMARY

The RAP team recorded 42 species of amphibians and 36 species of reptiles, including one species of frog in the genus *Hypsiboas* that is new to science. The amphibian community was most similar to those of forests on bauxite plateaus in western Suriname. Some rare species were collected, of which the tree frog *Osteocephalus cabrerai* and the amphisbaenian *Amphisbaena slevini* were collected from Suriname for the first time. We also encountered *Chelonoides denticulata* (Yellow-footed Tortoise), listed as Vulnerable on the IUCN Red List. Apart from caimans, most of the herpetofauna of the area seems to be minimally impacted by human activities such as hunting and fishing from the community of Kwamalasamutu. We discovered that certain expected species that are quite common in other areas in Suriname were either not found or found in very moderate numbers on the RAP survey. On the other hand, we found certain generally rare species to be quite common, emphasizing the importance of the region's forests to the biodiversity of Suriname and the Guiana Shield. Recommended conservation measures include avoiding large-scale deforestation in the region, and controlling the hunting of caimans.

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#### INTRODUCTION

Amphibians are very important indicators of disturbance, because they are sensitive to changes in microclimate, and worldwide many species recently became extinct as the result of several impacts, including habitat change, pollution and disease. The group is well suited for rapid assessments, as the species are often easy to sample and their calls are diagnostic, which aids identification of species that cannot be collected, such as tree frogs in the rainforest canopy. Of the reptiles, lizards are often sensitive to changes in microhabitat. Many species are restricted to pristine forest habitats, and tend to disappear from regions of highly degraded forest. Caimans, turtles, and tortoises are generally good indicators of hunting pressure.

Although two previous expeditions by the National Zoological Collection / Anton de Kom University of Suriname visited southern Suriname in 1988 and 1989, these expeditions focused on the Sipaliwini Savanna and the Apalagadi area north of the savanna, and did not survey any areas in the vicinity of Kwamalasamutu. The Kutari River has never been visited by a biological expedition before. The goal of this survey was to provide baseline information on the diversity and abundance of reptiles and amphibians in the forests of the Kwamalasamutu region.

## METHODS

Four areas along the Kutari and Sipaliwini Rivers were investigated for amphibians and reptiles. Six days were spent at each of the three RAP sites (see Executive Summary for site descriptions). Iwana Samu was visited for only 2 days, but collections were made there as well.

We sampled the herpetofauna by walking trails at each survey site and searching for animals along the trails. Most of the trails had been cut during the month before the RAP survey, and some trails were extended during our stay at each site. Trails were walked during morning, early afternoon and evening to observe and/or collect amphibians and reptiles. Special attention was given to creeks, downed logs, cavities, and other favourable habitats, to discover as many species of amphibians and reptiles as possible.

Specimens were captured by hand. Frog calls were recorded using a Marantz PMD660 solid state recorder and Sennheiser ME 67 directional microphone. Calls were compared with known calls for the frogs of French Guiana (Marty & Gaucher 2000) and Ecuador (Read 2000).

Many specimens were identified on site. Some specimens, particularly those that could not be identified conclusively in the field, were collected and preserved for later identification in the laboratory. Specimens were euthanized using an injection of Nembutal, fixed in 4% formaldehyde solution, and subsequently preserved in 70% ethanol. All specimens are deposited in the National Zoological Collection of Suriname.

Species diversity and richness were calculated using Simpson's index of diversity, the Shannon-Wiener diversity index, and Chao 1 (Magurran 2004), using the software package Species Diversity & Richness IV (Pisces Conservation Ltd). PCA analysis was accomplished with the software Community Analysis Package 4 of the same provider.

## RESULTS AND DISCUSSION

A total of 42 species of amphibians and 36 species of reptiles was observed in the area (Appendix). An estimation of the total number of species in the area based on Chao & Lee 1 is 42.84 amphibians and 43.34 reptiles. It can therefore be concluded that the sampling of amphibians was adequate, but that continued sampling of reptiles would probably yield additional species.

The most exciting discovery was a tree frog in the genus *Hypsiboas* that is new to science. This frog was discovered in swamp forest directly adjacent to the camp at the Kutari River site; one specimen was collected. Photos of this frog, as well as descriptive notes, will appear in the forthcoming Amphibians of Suriname (Ouboter and Jairam *in press*).

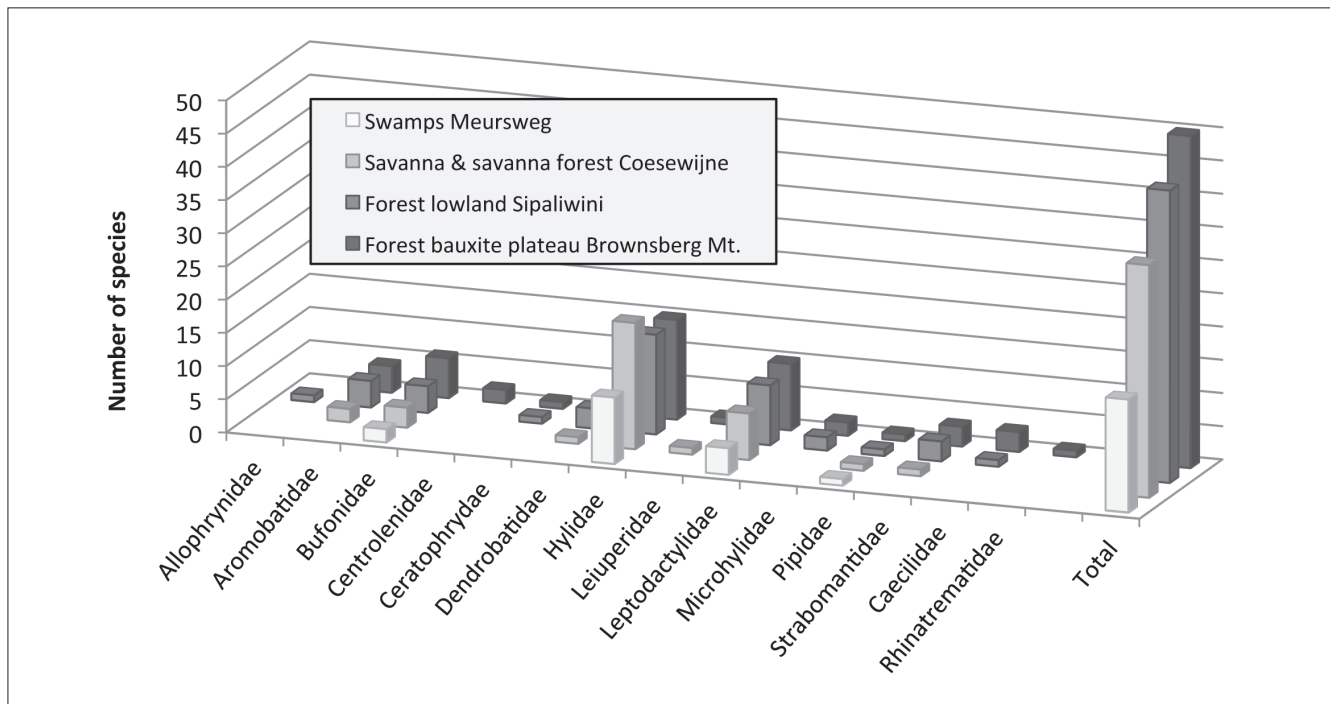
The diversity of the areas investigated is shown in Table 1. The Sipaliwini site had the highest species diversity of the three RAP sites. Werehpai had the greatest number of reptile species, but high abundance of three species of lizards significantly decreased evenness at the site, and consequently the  $\alpha$  diversity values.

The PCA analysis showed that the community structure of the three RAP sites differed significantly, and that the findings from all three (or even more) sites are needed to obtain an overview of the herpetofauna of the area. A comparison of the amphibian community of the Kwamalasamutu area with other areas of Suriname is shown in Fig. 1. Within Suriname, the amphibian community of the Kwamalasamutu region is most similar to the communities on forests on bauxite plateaus, but is probably slightly poorer in the number of species, especially in the families Aromobatidae and Caeciliidae.

A number of rare species was collected during the survey: *Osteocephalus cabrerai*, a rare tree frog from the western Amazon Basin and French Guiana, is herewith reported from Suriname for the first time. *Scinax proboscideus* is a tree frog with a nasal appendix, previously known from only two localities in the interior of Suriname and a few localities in French Guiana (Ouboter and Jairam *in press*). *Microcaecilia taylori* was described from three specimens collected from forest islands in the Sipaliwini Savanna (Nussbaum

**Table 1.** Alpha diversity of the three RAP sites. It should be noted that the time spent at Iwana Samu was much less than at the other three sites.

	Site 1 Kutari	Site 2 Sipaliwini	Site 3 Werehpai	Iwana Samu
<b>Amphibians</b>				
Species richness	23	27	26	12
Simpson's index	13.86	15.40	11.38	7.02
Shannon-Wiener	2.73	2.92	2.75	2.07
<b>Reptiles</b>				
Species richness	14	13	21	1
Simpson's index	6.56	17.10	7.55	-
Shannon-Wiener	2.13	2.41	2.38	-



**Figure 1.** Comparison of the amphibian community of the Kwamalasamutu region (lowland forest) with amphibian communities at Brownsberg (forest on bauxite plateaus), Boven Coesewijne area (savanna & savanna forest) and the Meursweg area (freshwater swamps).

& Hoogmoed 1979). The specimen collected by us is the fourth, and shows that this species is not restricted to the Sipaliwini Savanna. The snake *Xenodon werneri* is quite rare and was previously known from only two specimens in Suriname, one from the Wilhelmina Mts. and the other from the Nassau Mts. (Hoogmoed 1985). The amphibiaean *Amphisbaena slevini*, known from the surroundings of Manaus (Brasil) and eastern French Guiana (Starace 1998), was collected on the RAP, providing the first record for Suriname and an extension of its known range.

Several species observed on the RAP survey are indicators of relatively undisturbed forests, including *Allobates granti*, *Ceratophrys cornuta*, *Ameerega hahneli*, *Hypsiboas fasciata*, *Leptodactylus hyeri*, *Chiasmocleis shudikarensis*, *Pristimantis chiastonotus*, *Pristimantis marmoratus*, *Bothriopsis biliniatus*, and *Gonatodes annularis*. Typical indicator species of forest clearing were absent. A generally anthropogenic species, *Rhinella marina*, was present at the Werehpaï site.

We observed several species of amphibians and reptiles listed in Appendix II of CITES, including species in the genera *Allobates*, *Ameerega*, *Dendrobates*, *Tupinambis* and *Paleosuchus*, and species of the families Boidae and Testudinidae. However, almost all of these are listed as “Least Concern” in the IUCN Red Data List (see Appendix). Exceptions are *Chelonoides denticulata*, which is listed as “Vulnerable”, and *Paleosuchus trigonatus*, which is listed as “Lower Risk/Least Concern (needs updating)”.

Most amphibians and reptiles are opportunistic predators of small to medium size animals: arthropods for frogs and lizards; annelids and the like for amphibiaeans; caecilians,

small snakes, and a variety of small vertebrates for snakes, turtles and caimans. Because of their opportunistic feeding behavior, their role in the ecosystem per species is probably minor. An exception is the role of caimans as top predators in the aquatic ecosystem (Fittkau 1973). A healthy caiman population may positively influence fish stocks and other characteristics of wetland ecosystems.

## CONSERVATION RECOMMENDATIONS

In general, the ecosystems investigated seem to have a healthy and diverse herpetofauna. The current intensity of fishing, hunting, and gathering activities does not seem to adversely affect most amphibian and reptile populations in the Kwamalasamutu region. Such activities are expected to have more impact if extensive deforestation occurs; therefore, large-scale deforestation should be prevented at all costs.

Although we did not carry out a targeted survey for caimans, the impression is the same as in 1988 (Ouboter 1989): near Kwamalasamutu, caimans are over-exploited and therefore rare. Every caiman encountered away from the village, e.g. in the Kutari area, is instantly killed by the local inhabitants. Caimans have a positive effect on fish populations and community structure, and should therefore be provided some form of protection in the vicinity of Kwamalasamutu and the broader region. This could be accomplished in several ways, including a no-hunting agreement during part of the year or during alternate years.

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**Appendix.** List of amphibians and reptiles found during the Kwamalasamutu RAP survey. Numbers indicate number of observations per site; they do not necessarily indicate that specimens were collected.

CLASS/(Sub)Order/Family	Species	Indicator of pristine forest	IUCN Red List Status	Kutari	Sipaliwini	Werehpai	Iwana Samu	
<b>AMPHIBIA</b>								
<b>ANURA</b>								
Allophryinae	<i>Allophryne ruthveni</i>		Least concern	4	2	4	1	
Aromatidae	<i>Allobates femoralis</i>		Least concern	1	2	34	2	
	<i>Allobates granti</i>	X	Least concern	6	0	4	0	
	<i>Anomaloglossus baeobatrachus</i>		Data deficient	13	7	7	0	
Bufonidae	<i>Rhaebo guttatus</i>		Least concern	3	2	5	1	
	<i>Rhinella martyi</i>		Least concern	3	0	0	0	
	<i>Rhinella lescurei</i>		Data deficient	12	13	9	0	
	<i>Rhinella marina</i>		Least concern	0	0	1	0	
Ceratophryidae	<i>Ceratophrys cornuta</i>	X	Least concern	0	0	2	0	
Dendrobatidae	<i>Dendrobates tinctorius</i>		Least concern	0	5	0	0	
	<i>Ameerega bahneli</i>	X	Least concern	1	1	10	0	
	<i>Ameerega trivittata</i>		Least concern	8	2	11	0	
Hylidae	<i>Dendropsophus minutus</i>		Least concern	0	4	0	0	
	<i>Hypsiboas boans</i>		Least concern	5	14	1	1	
	<i>Hypsiboas calcaratus</i>		Least concern	1	22	0	6	
	<i>Hypsiboas cinerascens</i>		Least concern	2	1	8	0	
	<i>Hypsiboas fasciatus</i>	X	Least concern	0	3	6	0	
	<i>Hypsiboas geographicus</i>		Least concern	0	4	0	0	
	<i>Hypsiboas</i> sp. nov.		Unknown	1	0	0	0	
	<i>Osteocephalus buckleyi</i>		Least concern	0	0	0	1	
	<i>Osteocephalus cabrerai</i>		Least concern	0	1	0	1	
	<i>Osteocephalus leprieuri</i>		Least concern	3	2	0	0	
	<i>Osteocephalus taurinus</i>		Least concern	0	0	1	0	
	<i>Scinax proboscideus</i>		Least concern	1	0	0	0	
	<i>Trachycephalus resinifictrix</i>		Least concern	0	0	2	0	
	<i>Phyllomedusa bicolor</i>		Least concern	0	11	0	0	
	<i>Phyllomedusa hypochondrialis</i>		Least concern	0	0	0	1	
	Leptodactylidae	<i>Leptodactylus bolivianus</i>		Least concern	0	2	0	0
		<i>Leptodactylus hyeri</i>	X	Least concern	1	0	0	0
<i>Leptodactylus</i> cf. <i>hylaedactylus</i>			Least concern	9	6	8	0	
	<i>Leptodactylus knudseni</i>		Least concern	1	2	1	0	
	<i>Leptodactylus myersi</i>		Least concern	0	13	0	0	
	<i>Leptodactylus mystaceus</i>		Least concern	9	6	14	9	
	<i>Leptodactylus pentadactylus</i>		Least concern	2	2	1	0	
	<i>Leptodactylus petersii</i>		Least concern	0	3	1	0	
	<i>Leptodactylus rhodomystax</i>		Least concern	0	0	9	1	
Microhylidae	<i>Chiasmocleis shudikarensis</i>	X	Least concern	0	0	2	0	
	<i>Hamptophryne boliviana</i>		Least concern	3	2	2	5	
Pipidae	<i>Pipa aspera</i>		Least concern	0	0	1	0	

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CLASS/(Sub)Order/Family	Species	Indicator of pristine forest	IUCN Red List Status	Kutari	Sipaliwini	Werehpai	Iwana Samu
Strabomantidae	<i>Pristimantis chiastonotus</i>	X	Least concern	0	2	1	0
	<i>Pristimantis marmoratus</i>	X	Least concern	0	0	2	0
	<i>Pristimantis zeuctotylus</i>		Least concern	1	8	0	1
<b>GYMNOPTIONA</b>							
Caeciliidae	<i>Microcaecilia taylori</i>	X	Least concern	1	0	0	0
<b>TOTAL</b>				<b>23</b>	<b>27</b>	<b>26</b>	<b>12</b>

<b>REPTILIA</b>							
<b>SERPENTES</b>							
Typhlopidae	<i>Typhlops reticulatus</i>		Least concern	1	0	0	0
Boidae	<i>Corallus enhydris</i>			0	0	1	0
	<i>Eunectes murinus</i>			0	0	1	0
Aniliidae	<i>Anilius scytale</i>			0	0	1	0
Colubridae	<i>Atractus flammigerus</i>			0	1	1	0
	<i>Atractus torquatus</i>			1	1	0	0
	<i>Dipsas pavonina</i>		Least concern	0	1	0	0
	<i>Drymarchon corais</i>			1	0	0	0
	<i>Helicops angulatus</i>			0	1	0	0
	<i>Hydrops triangulatus</i>			1	0	0	0
	<i>Imantodes cenchoa</i>			0	1	0	0
	<i>Liophis typhlus</i>			2	0	0	0
	<i>Philodryas argenteus</i>		Least concern	0	0	1	0
	<i>Siphlophis cervinus</i>			0	0	1	0
	<i>Xenodon werneri</i>			0	1	0	0
Viperidae	<i>Bothriopsis biliniatus</i>	X		0	0	1	0
	<i>Bothrops atrox</i>			0	1	0	0
<b>AMPHISBAENIA</b>							
Amphisbaenidae	<i>Amphisbaena slevini</i>		Data deficient	1	0	0	0
<b>SAURIA</b>							
Polychrotidae	<i>Anolis nitens</i>			2	4	3	0
	<i>Anolis punctatus</i>			0	0	1	0
Gekkonidae	<i>Coleodactylus amazonicus</i>			13	1	0	0
	<i>Gonatodes annularis</i>	X		0	0	2	0
	<i>Gonatodes humeralis</i>			0	0	2	0
	<i>Thecadactylus rapicauda</i>			0	0	1	1
Gymnophthalmidae	<i>Arthrosaura kocki</i>		Least concern	0	0	13	0
	<i>Gymnophthalmus underwoodii</i>		Least concern	0	0	1	0
	<i>Leposoma guianense</i>			8	2	17	0
	<i>Neusticurus bicarinatus</i>			1	1	0	0
Scincidae	<i>Mabuya nigropunctata</i>			1	0	3	0

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CLASS/(Sub)Order/Family	Species	Indicator of pristine forest	IUCN Red List Status	Kutari	Sipaliwini	Werehpai	Iwana Samu
Teiidae	<i>Kentropyx calcarata</i>			5	3	10	0
	<i>Tupinambis nigropunctata</i>			0	0	1	0
Tropiduridae	<i>Plica plica</i>			0	0	1	0
	<i>Plica umbra</i>			0	1	1	0
<b>CHELONIA</b>							
Chelidae	<i>Platemys platycephala</i>			0	0	1	0
Testudinidae	<i>Chelonoidis denticulata</i>		Vulnerable	1	0	0	0
<b>CROCODILIA</b>							
	<i>Paleosuchus trigonatus</i>		lower risk/ least concern (needs updating)	2	0	0	0
<b>TOTAL</b>				<b>14</b>	<b>13</b>	<b>21</b>	<b>1</b>