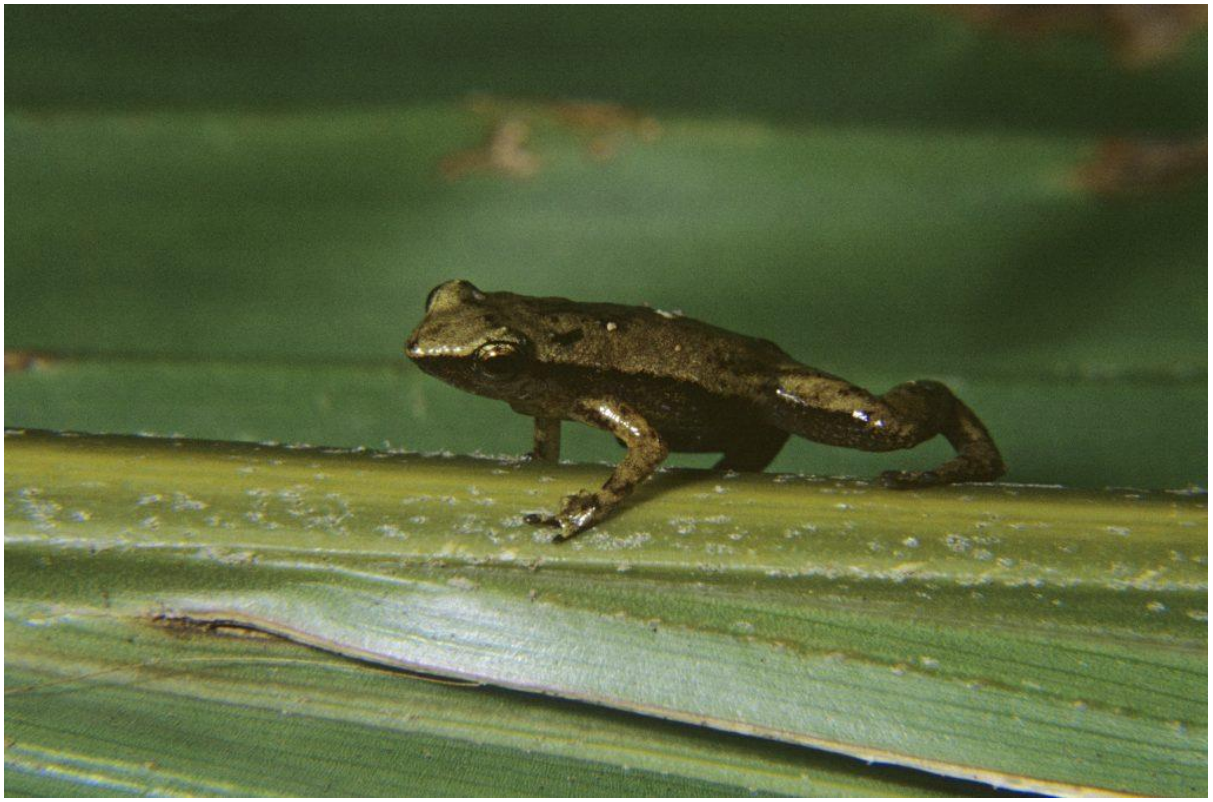
ZSL
LET'S WORK FOR WILDLIFE

EDGE

EVOLUTIONARILLY DISTINCT & GLOBALLY ENDANGERED

Survival Blueprint

Sooglossidae frog family



Sooglossus pipilodryas, Seychelles palm frog ©Justin Gerlach

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1. STATUS REVIEW

1.1 Taxonomy:

Chordata > Amphibia > Anura > Sooglossidae > *Sooglossus* > *sechellensis*

Chordata > Amphibia > Anura > Sooglossidae > *Sooglossus* > *thomasseti*

Chordata > Amphibia > Anura > Sooglossidae > *Sechellophryne* > *gardineri*

Chordata > Amphibia > Anura > Sooglossidae > *Sechellophryne* > *pipilodryas*

The Sooglossidae family is endemic to the Seychelles. It consists of two genera (*Sooglossus* and *Sechellophryne*) and four known frog species, and one undescribed species recently discovered on Praslin Island. Its closest relative is the Purple frog *(Nasikabatrachus sahyadrensis)* of the Nasikabatrachidae family from the Western Ghats of India

1.2 Distribution and population status:

1.2.1 Global distribution:

Country	Population estimate (plus references)	Distribution	Population trend (plus references)	Notes
Seychelles	*S. gardineri* **482,575** individuals (N. Doak 2007) *S. sechellensis* **5972 ??** individuals (N. Doak 2007) **S. sechellensis*?? **5000** individuals (J. Labisko 2015) *S. thomasseti* **13,652** individuals (N. Doak 2007)	Mahé Island Praslin Island Silhouette Island	Unknown for all the four species (N. Doak 2007)	Population estimate is only for Mahé Island, no data is available for Silhouette Island, and solely based on Doak's field surveys August 2006-March 2007. *Population estimate is solely based on Taylor's field surveys 2010 on Praslin Island.

1.2.2 Local distribution:

Country	Region / province	Site	Level of Protection	Population size	Reference(s)	Notes
Seychelles	Mahé Island	Morne Seychellois National Park	Medium-High	*S. gardineri* **482,575** individuals *S. sechellensis* **5972** ??? individuals *S. thomasseti* **13,652** individuals	(N. Doak 2007)	Population estimate is only for Mahé Island, no data is available for Silhouette Island, and solely based on Doak's field surveys August 2006-March 2007.
Seychelles	Praslin Island	Praslin National Parks (including Vallée de mai World Heritage Site)	Medium-High	*S. sechellensis*?? **5000** individuals	(J. Labisko 2015)	Population estimate is solely based on Taylor's field surveys 2010.
Seychelles	Silhouette Island	Silhouette National Park	Medium-High	Unknown		No data is available on species status.

1.3 Protection status:

All 4 species are ranked within the top 100 evolutionarily distinct and globally endangered (EDGE) amphibians and all are Red-Listed as 'Vulnerable' or 'Endangered' by the International Union for the Conservation of Nature (IUCN), due to their highly restricted area of occupancy. A significant proportion of the best

sooglossid habitat is protected on Mahé Island (Seychellois National Park), Praslin Island (Praslin National Park including Vallée de mai World Heritage Site) and Silhouette Island (Silhouette National Park). However, all 4 species do not have legal protection status and their population size is considered to be unknown (N. Doak 2007).

1.4 Ecology, behaviour and habitat requirements:

Sooglossids are terrestrial breeding frogs and therefore do not require water for larval development. The adults' mate on land and they can breed throughout the year depending on the weather conditions. They lay 10 to 15 eggs in terrestrial nest sites that are well hidden among wet leaves or moss, under or between rocks, and inside logs (Nussbaum 1984). The diet of sooglossid frogs consists mostly of mites, termites, sciarid fly larvae, ants, beetles, and beetles and insects' larvae. However, the Thomasset's frog- *Sooglossus thomasseti* could probably eats correspondingly larger prey such as spider, woodlouse and larger insects (Nussbaum 1984).

They occur mostly in the wet and humid sub-montane (300-500m) and montane forests (>500m) of Mahé and Silhouette Islands, and in the dry coastal palm forest of Praslin Island. Sooglossids are known to be extremely rare but in fact they can be abundant in suitable habitat characterised by very high humidity levels and extensive layers of moss in the mountainous areas (above 600m) on Mahé and Silhouette Islands (Edgar 2003).

1.5 Threat analysis:

Habitat Loss & Fragmentation

Recent development has tended to take place further and further up the slopes, especially on Mahé Island and is now encroaching on upland mountain forests. However, due to the severe topography itself, it is unlikely that we will experience excessive sooglossid habitat loss in these areas and therefore fragmentation is unforeseeable soonew native forest areas still exist on Mahé Island (below 600m). However, even in these areas which appear to be pristine, the dominant plant species are mostly introduced trees and shrubs. Nonetheless, these forests seem to provide suitable physical conditions for sooglossids and all three species were

recorded below 600m on Mahé Island during various field surveys (Edgar 2003, N. Doak 2007, pers. obs. 2015)

Introduced animal species

Although sooglossids seem to adapt well to introduce plants, there is a genuine concern that introduced fauna may threaten them in one of two main ways (Edgar 2003, N. Doak 2007).

- Competition- Only one introduced frog species (Ptychadaena mascareniensis) is established on main Islands including Mahé, Praslin and Silhouette. This species occurs almost exclusively in lowland areas (below 300m) and therefore, it is an unlikely competitor to sooglossids as they have different habitat requirements.
- Predation- A few potential sooglossid's predators (tenrecs, rats, cats and various birds) have been introduced to the main Islands including Mahé, Praslin and Silhouette. Currently, it does not appear to have been any significant adverse affect on population size of sooglossids. However, their impact remains unknown and requires further investigation.

Diseases

The spread of Batrachochytrium dendrobatidis (Bd), vector for the fungal disease chytridiomycosis (chytrid) is recognised as a serious threat to global amphibians' population. Currently, chytrid has not yet been detected in the Seychelles and transmission via tourist traffic is an ever present risk (J. Labisko 2015). Furthermore, there is no disease monitoring system in place for Seychelles amphibians and despite the recent government's effort to ban trade in aquarium fish there is still the possibility of them being smuggle into the country.

Climate change

Seychelles weather patterns have been shifting over recent years, with more prolong dry season (less rainfall) there could be a significant range retraction for all sooglossid species in the coming years (N. Doak 2007). Therefore, it is imperative that we have a long-term monitoring programme in place as amphibians may expand, contract or shift their range in response to increasing temperatures and

decreasing humidity. However, range shifts may be impeded latitudinally by fragmented and degraded habitat and altitudinally by availability of suitable upland habitat as sooglossids were found to be more abundant in mountain forests (N. Doak 2007, J. Labisko 2015).

1.6 Stakeholder analysis:

Country	**Stakeholder**	**Stakeholder's interest in the species' conservation**	**Current activities**	**Impact** *(positive, negative or both)*	**Intensity of impact** *(low, medium, high or critical)*
Seychelles	Seychelles National Parks Authority (SNPA)	Conservation and research	There has been some work in the past but recent activities have been the research work that I have undertaken within my 2 year EDGE fellow ship	+	High
Seychelles	Island Conservation Society (ICS)	Conservation and research	There is no activity since the departure of another NGO (NPTS) from Silhouette Island in 2008/09	+	High
Seychelles	Seychelles Islands Foundation (SIF)	Conservation and research	There is no activity since the surveys conducted by Taylor (2012) and Labisko (2015)	+	Medium
Seychelles	Ministry of Environment & Energy (MEE)	Conservation	None	+	Medium
Seychelles	University of Seychelles (UNISEY)	Research	None	+	Medium
Seychelles	Environment Trust Fund (ETF)	Conservation	Funders	+	High

2. ACTION PROGRAMME

Vision (30-50 years)	
There are viable sooglossidae population on all the three islands (Mahé, Praslin and Silhouette)	
Goal(s) (5-10 years)	
To ensure that there is a long-term monitoring programme in place on all the three islands (Mahé, Praslin and Silhouette), and reduce data deficiency on sooglossid frogs' ecology and the risk of chytrid disease from arriving into the country.	
Objectives	**Prioritisation** *(low, medium, high or critical)*
(1) Establish a long-term monitoring programme for the conservation of sooglossid frogs within protected areas on all three islands (Mahé, Praslin and Silhouette).	Critical
(2) Status of Sooglossidae is known through research on population size, ecology and behaviour of all four species.	High
(3) Develop partnership between different organisations managing protected areas in Seychelles to facilitate sharing of information.	High
(4) Review and update the Sooglossidae Conservation Action Plan (Survival Blueprint) through a stakeholders' participatory process.	Critical
(5) Actively involve University of Seychelles' students in field research and scientific data analysis, and other conservation activities.	Medium
(6) Develop and enforce legislation to reduce the risk of the chytrid disease from arriving into the country.	Critical
(7) Increase visibility of Sooglossidae nationally to attract more funding.	Low

Activities	Country / region	Priority *(low, medium, high or critical)*	Time scale	Responsible stakeholders	Indicators	Risks	Activity type
Objective 1: Establish a long-term monitoring programme for the conservation of sooglossid frogs within protected areas on all three islands (Mahé, Praslin and Silhouette).							
1.1 Train staff in the field monitoring methodology	Mahé Island Praslin Island Silhouette Island	Critical	2016	SNPA SIF ICS	Number of field research staffs trained	Field research staffs are present on all three islands	Capacity building
1.2 Identify the long-term monitoring sites and set up permanent transects and/or plots	Mahé Island Praslin Island Silhouette Island	Critical	2016	SNPA SIF ICS	Number of monitoring transects and/or plots established		Species management and early detection of threats
1.3 Conduct the field surveys and produce field reports	Mahé Island Praslin Island Silhouette Island	Critical	Once or twice per year	SNPA SIF ICS	Number field surveys and periodic reports	Disinterest by field staffs or management authority	Improving knowledge and sharing information
Objective 2: Status of Sooglossidae is known through research on population size, ecology and behaviour of all four species.							
2.1 Train staff in the field research methodology	Mahé Island Praslin Island Silhouette Island	High	2016	SNPA SIF ICS UNISEY	Number of staffs trained	Finding interested students	Capacity building

Activities	Country / region	Priority *(low, medium, high or critical)*	Time scale	Responsible stakeholders	Indicators	Risks	Activity type
2.2 Conduct the field surveys and produce field reports	Mahé Island Praslin Island Silhouette Island	High	Once per year	SNPA SIF ICS UNISEY	Number field surveys and periodic reports	Disinterest by management authority	Improving knowledge and sharing information
Objective 3: **Develop partnership between different organisations managing protected areas in Seychelles to facilitate sharing of information**							
3.1 Meeting with key partners/ stakeholders to discuss the implementation of the Action Plan	Mahé Island but we could host it on other Islands if we have sufficient fund	High	Once every 2-3 year	SNPA SIF ICS UNISEY MEE ETF	Number of minutes meeting	Low participation of partners/ stakeholders	Sharing information
3.2 Set up a forum to facilitate data and information exchange among all partners	Mahé Island	Critical	Start in2017	UNISEY	Forum established and a database set up	Willingness of partners to share their data and information	Sharing data and information exchange
Objective 4: **Review and update the Sooglossidae Conservation Action Plan (Survival Blueprint) through a stakeholders' participatory process**							
4.1 Meeting with key partners/ stakeholders to review the Action Plan	Mahé Island	Critical	Late 2016	SNPA SIF ICS UNISEY MEE ETF	Minutes of Key issues discuss during the meetings	Willingness of partners/ stakeholders to contribute to the reviewing process	Policy

Activities	Country / region	Priority *(low, medium, high or critical)*	Time scale	Responsible stakeholders	Indicators	Risks	Activity type
4.2 Drafting of the new Action Plan incorporating partners/ stakeholders' inputs	Mahé Island	Critical	Early 2017	MEE	An updated Sooglossidae Conservation Action Plan		Policy
Objective 5: **Actively involve University of Seychelles' students in field research and scientific data analysis, and other conservation activities.**							
5.1 Train UNISEY's students in the field research methodology and scientific data analysis	Mahé Island	Medium	Once every year	UNISEY SNPA	A new cohort of BSc students trained		Capacity building and species data management
5.2 Engage UNISEY's students in participating in field research and other conservation activities	Mahé Island Praslin Island Silhouette Island	Medium	Once every year	SNPA SIF ICS UNISEY	Number field research reports	Willingness of students in field research and other conservation activities	Improving and sharing knowledge
Objective 6: **Develop and enforce legislation to reduce the risk of the chytrid disease from arriving into the country**							
6.1 Develop and draft appropriate legislation to reduce chytrid disease risk	Mahé Island	Critical	By end 2020	MEE SNPA SIF ICS	A draft legislative document	Low priority in legislation.	Law and Policy

Activities	**Country / region**	**Priority** *(low, medium, high or critical)*	**Time scale**	**Responsible stakeholders**	**Indicators**	**Risks**	**Activity type**
6.2 Train staff in detecting possible vectors' of chytrid disease	Mahé Island Praslin Island	Critical	Early 2017	Government agencies, NGOs	Number of personnel trained	Low priority for government agencies	Law and Enforcement
Objective 7: **Increase visibility of Sooglossidae nationally to attract more funding**							
7.1 Raise awareness of the conservation significance of Sooglossidae among authorities, decision-makers and potential funders (including private sector) nationally		Low	2017-18	SNPA SIF ICS UNISEY MEE	Number of meetings and fundraising activities	Disinterest of some authorities and potential donors	Awareness and fund raising

3. LITERATURE CITED

Doak, N. (2007) Saving rare island frogs: a project to investigate and conserve the endemic frog family Sooglossidae in the Seychelles Islands. Nature Seychelles.

Edgar, P. (2003) The sooglossid frogs of Mahé island, Seychelles: A report for Nature Seychelles and RSPB. The Herpetological Conservation Trust. Unpublished report.

Labisko J. Maddock ST, Taylor Ml, Chong-Seng L, Gower DJ, Wynne FJ, Wombwell E, Morel C, French GCA, Bunbury N, Bradfield KS. 2015. Chytrid fungus (*Batrachochytrium dendrobatidis*) undetected in the two ordrs of Seychelles amphibians. Herpetological Review 46: 41-45.

Nussbaum, R.A. (1984) Amphibians of the Seychelles. Pp. 379-415 in D.R. Stoddart (ed.) Biogeography and Ecology of the Seychelles Islands. Dr. W. Junk Publishers, Boston.

Taylor, M. L., N. Bunbury, L. Chong-Seng, N. Doak, S. Kundu, R. A. Griffiths, AND J. J. Groombridge. 2012. Evidence for evolutionary distinctiveness of a newly discovered population of sooglossid frogs on Praslin Island, Seychelles. Conserv. Genet. 13:557566.