The Seychelles sheath-tailed bat Coleura seychellensis in 2010 – status and recommendations for its conservation

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The Seychelles sheath-tailed bat Coleura seychellensis is one of the most threatened bat species; it is listed as Critically Endangered and is believed to number fewer than 100 individuals. It is endemic to the granitic islands of the Seychelles group. Currently 4 roost sites have been identified on the islands of Mahé and Silhouette. Historically it was also present on Praslin and La Digue islands but appears to be extinct on both of these. Intensive research and conservation work has been carried out on the Silhouette population since 1997 but the Mahé population has been comparatively little studied. A small number of field surveys have been carried out in recent years and in 2009 Nature Protection Trust of Seychelles and the Seychelles Ministry of Environment undertook a study of the roosts with the financial support of Conservation International Madagascar. The results of this project are presented here with an update of the status of the Silhouette population and a review of the conservation needs of the species.

Mahé population

The project was designed to included two components: surveys and habitat management. The habitat management component has not been undertaken as land ownership could not be determined in the life-time of the project. The survey component has been successfully completed and provides valuable data for conservation planning for the species as a whole.

1. Identify roosts

Three roosts are known (Bel Ombre, Cap Ternay and, Baie Lazare), no new roosts were identified. Evaluation of habitat areas and mapping allowed some potential sites to be identified for further survey (see under point 2 below).

2. Identify core feeding areas

General areas have been identified, these could be refined further, particularly around the Bel Ombre roost. Habitat quality was measured in terms of vegetation composition around and near the roosts, evaluation of habitat data allowed a model of bat occupancy to be produced. This needs ground-truthing in the south of Mahé and on Praslin and La Digue. Basic results are shown below.

3. Identify management units

Faecal samples were collected in 2009 for genetic study, this study is ongoing.

4. Manage habitats

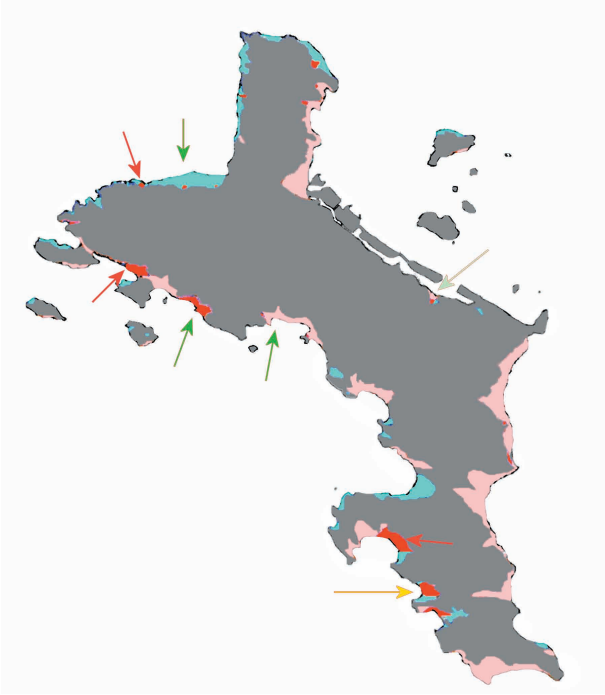
No action taken. Priority management areas were identified but management cannot be undertaken until land ownership has been determined.

Silhouette population

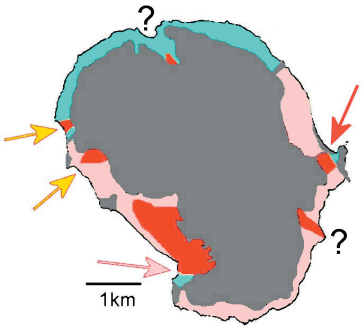
Three roost areas are known on Silhouette: Pte. Etienne (east coast) was abandoned at an unknown date in the past, Grande Barbe (south-east) supported at least one bat until 2004 but none have been recorded since then and La Passe (west) contains an active roost. The La Passe roost increased from 18 bats in 1996 to 40 in December 2009. By March 2010 12 bats had left the colony, bringing the number down to 28. In April at least some of the 12 were located to the south, feeding in an old settlement area of Anse Lascars. So far the exact location of the roost has not been located (island residents who used to live at Anse Lascars report that there was a roost there in the past but no-one has been able to remember where it was).

Potential distribution of the Seychelles sheath-tailed bat
pink – suitable foraging in the north-west monsoon; blue – suitable in the south-east; red – overlap [suitable foraging all year]; red arrow – occupied roost; pink arrow – recently abandoned roost; yellow arrow – old abandoned roost; green arrow – foraging bats recorded but no roost located; ? – anecdotal reports of old roosts

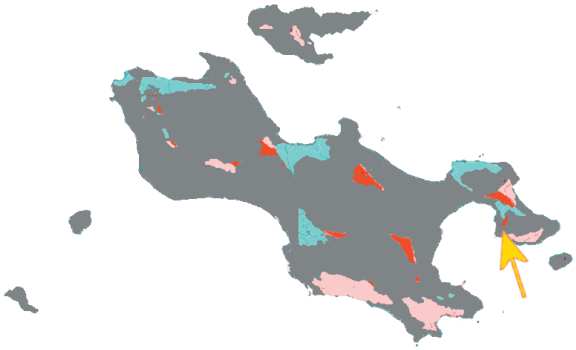
Mahé



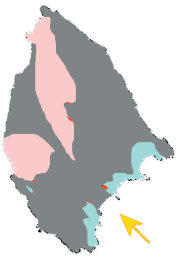
Silhouette



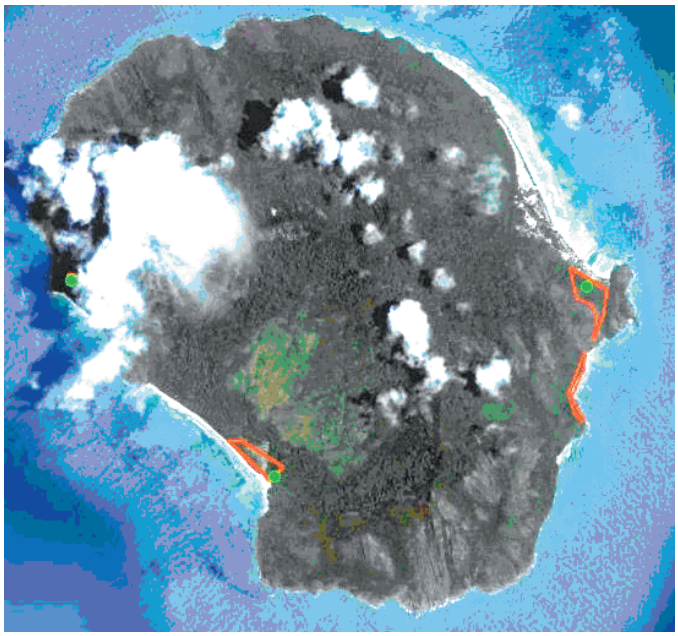
Praslin



La Digue



Silhouette bat areas: red – foraging areas, green – roost sites



Conservation action plan for the Seychelles sheath-tailed bat

1. Research

1.1 Population genetics

Samples collected in 2009 are being analyses. At present no information is available on the results or whether all roots have been adequately sampled. Each active roost should be considered a separate conservation unit until genetic results are available.

1.2 Distribution

Roost sites and foraging areas are adequately known for the 4 known active roosts. Probable active roosts exist on Mahé at Beoliere and Anse Takamaka. Further surveys are needed in these areas and around Bel Ombre to identify the main roost at that site. Further surveys are also needed on Praslin and La Digue as these islands are significantly under-surveyed compared to Mahé and Silhouette.
On Silhouette further searches are needed around Grande Barbe to locate the roost site used by at least one bat in the past.

1.3 Ecological research

Basic ecological research has been carried out on diet, activity, within-roost behaviour and reproduction. Further ecological research could be carried out but this would not influence conservation management.

2. Monitoring

2.1 Mahé roost counts

The Mahé population needs more accurate monitoring than has been carried out to date. Only the Bel Ombre roost is fully accessible and this does not appear to be the main roost of this population. At Baie Lazare accurate counts have been made by entering the roost but this is difficult to achieve without disturbance at this site. The Cap Ternay roost has not been entered and the population census has been conducted using emergence counts. Initial counts (until late 2006) covered only one of several entrances and cannot be considered accurate. Subsequent counts are more accurate. However, the highly active flight of this species and its repeated movement between roost chambers makes emergence counts extremely difficult. A comparison of emergence counts with the known censused population of La Passe, Silhouette allows the accuracy of emergence counts to be evaluated. In April 2010 28 bats were present in the roost, emergence counts were only 68% accurate. The largely inaccessible roosts should also be investigated using remote cameras which could be moved into the roost to provide data on the roost and the location of the bats without the need to enter the roost directly.

Population data from Mahé, corrected estimate based on the La Passe comparison:

Roost	**2004**	**2007**	**2009**	**type**	**corrected 2007 estimate**
Anse Major	8	2	2	census 2	
Baie Lazare	4	5-12	?	emergence	3-16
Cap Ternay	3-7	20-32	?	emergence	14-42

It is recommended that the following monitoring should be undertaken or maintained:

Island	**Roost**	**Activity**	**Frequency**	**Requirement**
Mahé	Bel Ombre	full count at existing roost, review any new roosts	at least annual	maintain monitoring of existing roost, search for further roosts
	Baie Lazare	emergence count, investigate roost	at least annual	regular monitoring
	Cap Ternay	emergence count, investigate roost	at least annual	regular monitoring

Island	Roost	Activity	Frequency	Requirement
Silhouette	La Passe	full count	quarterly	maintain existing monitoring
	Anse Lascars	locate roost and apply appropriate method	quarterly	regular monitoring

2.1 Silhouette roost counts

The La Passe population is relatively accessible and is counted accurately every 3 months. This should be maintained. Once the Anse Lascars roost is located this should also be monitored regularly.

3. Habitat

3.1 Protection

Protection is essential for all known populations of this species, covering roost sites and foraging areas. New developments in areas used by bats for roosting or foraging should be required to provide rangers or funding for the employment of rangers to protect the area and to manage habitat restoration. Existing developments in these areas should also be encouraged to provide such support as part of the conservation management agreements for these sites

3.1.1 Mahé roosts

For many of the Mahé roots full protection may be impractical but conservation areas should be defined with the agreement of landowners.

1.2 Silhouette roosts

La Passe – the La Passe roost and foraging areas are contained within the boundary of the proposed Silhouette National Park. This should provide a degree of security when the park is written into law (expected in the first half of 2010).

Anse Lascars – the area used for foraging at Anse Lascars is on the boundary of the proposed National Park and so will not be fully protected. The roost area is probably in the protected area but remains to be located.

Grande Barbe – the known abandoned roost at Grande Barbe is within the boundary of the proposed Silhouette National Park. At least one bat has been present at Grande Barbe but not using the known roost, all probable roosting habitat is also within the NP boundary. However, foraging habitat lies outside the boundary. Grande Barbe has the potential to make a major contribution to the recovery of this species but this requires some form of protection of the plateau of Grande Barbe through extension of the NP boundary or a legal conservation management agreement to limit change to the woodland and marshland and restrict pesticide use.

3.2 Manage habitat

Comparison of the vegetation surrounding roost entrances indicates that alien vegetation is not a major problem around the entrances of the occupied roosts. The highest levels of invasion are at Cap Ternay (43%) and Bel Ombre (43%) and invasive plants could be managed in those areas, although management near roosts should mainly be restricted to creeper control, with only very rare and careful tree felling. Foraging habitat shows extremely high levels of invasion at Baie Lazare (89%) and Bel Ombre (70%), with a lower level at Cap Ternay (57%). The healthiest surrounding habitat is at La Passe: 50% in the general surrounding habitat and only 20% in the best foraging area. Habitat management should seek to create areas of prime foraging habitat with invasive plants forming approximately 20% of the plant species. Recommended management areas have been mapped. For each of these management areas agreement is needed with land-owners to ensure that they can be maintained for bat foraging permanently.

4. Reintroduce

Two locations could support bats but have lost their populations due to invasive plants obscuring roost entrances: Grande Barbe and Pointe Etienne on Silhouette. With habitat management these areas would be suitable for the creation of new populations.

5 Management of other issues

5.1 Pesticides

Pesticides are implicated in many bat population declines. It has been speculated that pesticide use may have contributed to the historical decline of the Seychelles sheath-tailed bat but there are no data on pesticide residues in this species. The close proximity of all roosts to suburban areas means that it is impossible to prevent pesticide use in bat foraging areas. Habitat management should aim to create prime foraging areas that will draw bats away from high risk sites. Where possible agreements should be made with local residents or hotel developments to minimise pesticide use in some areas. In particular the use of insecticidal fogging should be prevented within 100m of any roost.

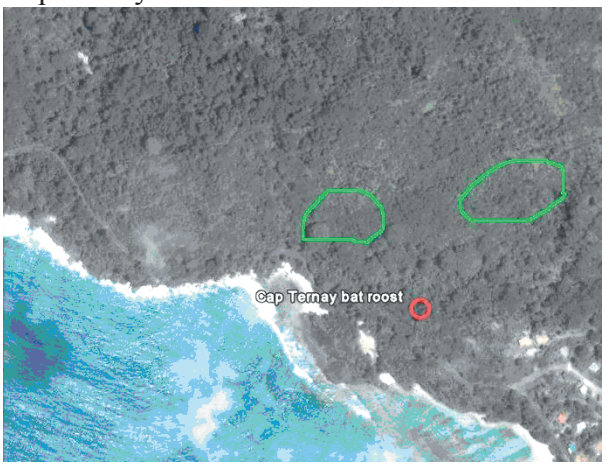
Management and protection areas of Mahé

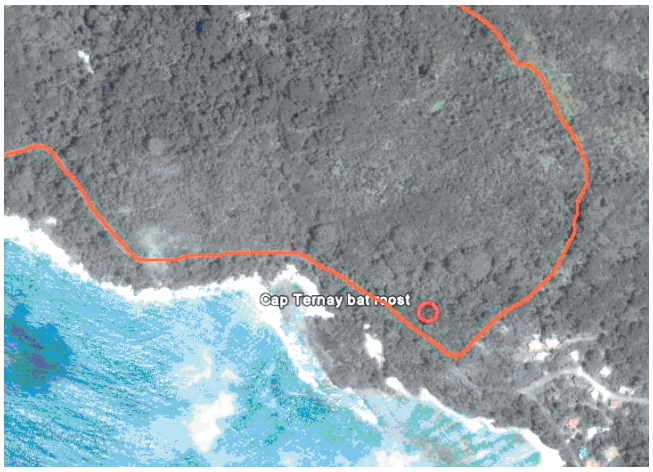
Green – areas suitable for management; red – proposed protection areas (for Bel Ombre the protection area to the south is the existing Morne Seychellois NP)

Management areas

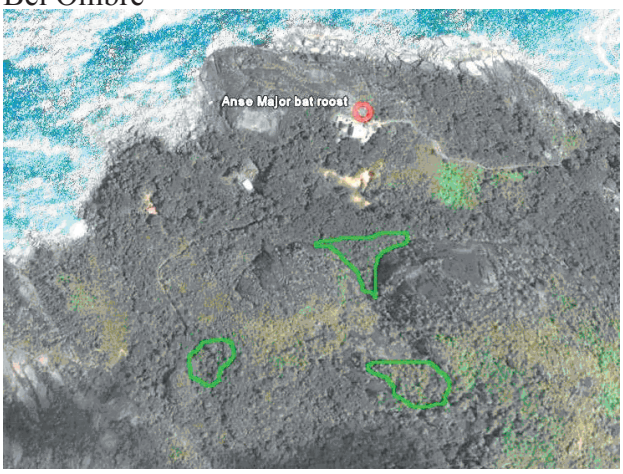
Protection areas

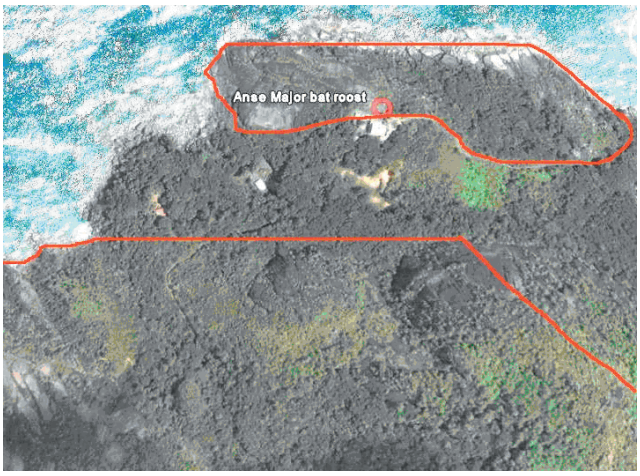
Cap Ternay



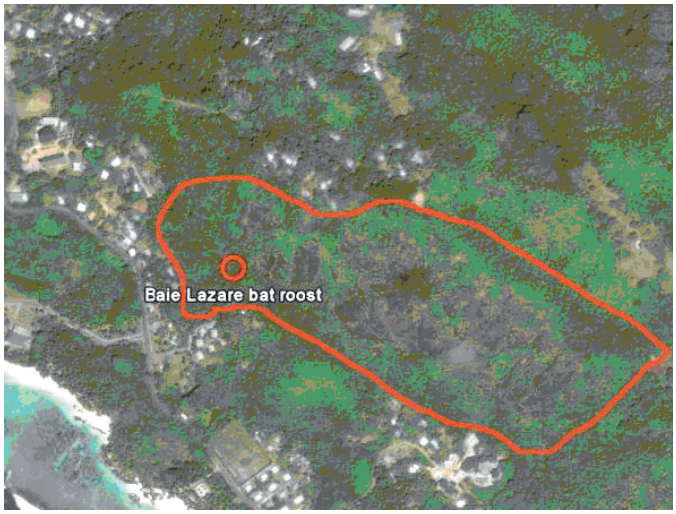


Bel Ombre





Baie Lazare



5.2 Predators

Introduced predators have been speculated to be an issue affecting the Seychelles sheath-tailed bat, however, there is no direct evidence of this. Barns owls are a potential predator and may need control in bat roost areas if they are present. Rats are unlikely to interact significantly with bats although observations on Silhouette suggest that an increase in rat numbers may attract cats and increase disturbance and the risk of occasional predation. These are not currently major threats but human activities near the roosts that could increase rat and cat numbers should be controlled (large increases in human populations, rubbish disposal etc).

5.3 Smoke

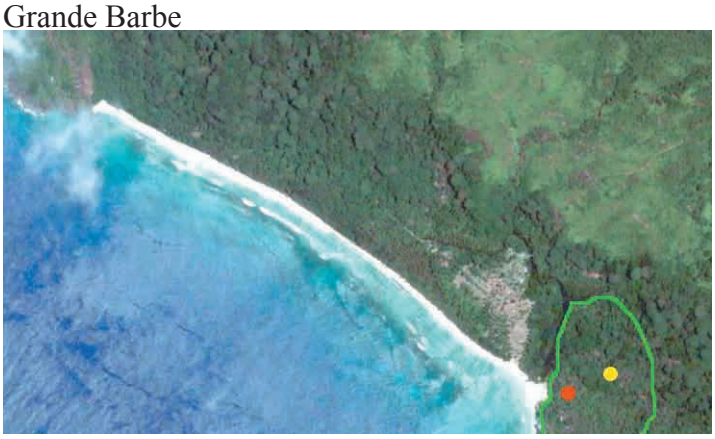
Observations of the Silhouette population show a high level of disturbance and consequent reduced breeding activity when smoke enters the roost. Accordingly fires should be restricted in the vicinity of any roost (i.e. rubbish fires and incinerators should not be sited within 200m of a roost).

Management and protection areas of Silhouette

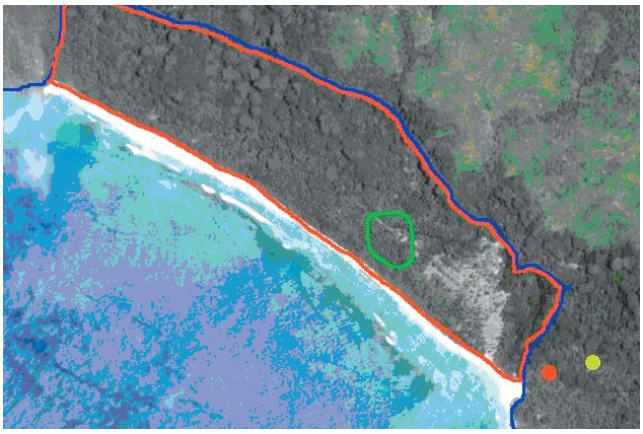
Green – areas suitable for management (management area map) or existing foraging area (protection area map); red – proposed protection areas; blue – proposed Silhouette NP boundary

Management areas

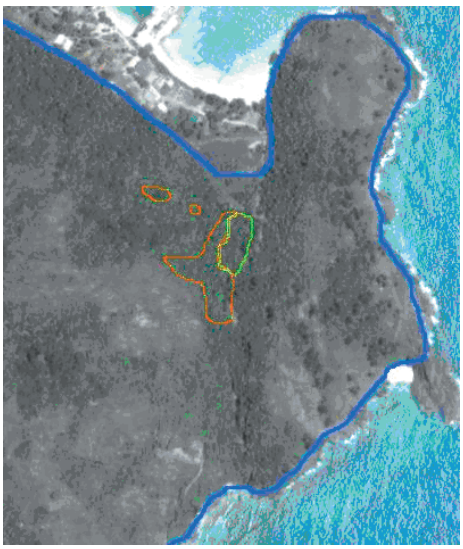
Grande Barbe



Protection areas



La Passe



6. Potential for population recovery

The increase of the La Passe population from a minimum of 14 individuals to 40 shows that relatively rapid population growth can occur. The level of inbreeding is expected to be high (but genetic data will clarify this) but no deleterious effects are apparent in this population. The population growth can be correlated to the area of available prime foraging habitat suggesting that the La Passe population may grow to some 50 individuals. A decrease in the recruitment rate is apparent, indicating some degree of density dependence due to increasing overcrowding. A maximum colony size of some 50 individuals would correspond to approximately 8.3 bats

per m2 of roost ceiling area. However, dispersal from the colony occurred when the colony reached 40 individuals, which therefore appears to be the true maximum (or 6.7 m-2). With estimates of similar roost areas (needing confirmation) for Baie Lazare and Cap Ternay it is estimated that securing the future of the known roosts would allow population recovery to at least 120 individuals.

7. Reporting

All activities connected to the sheath-tailed bat should be reported regularly; annual reports of projects (whether run by government, NGO or land-owner/conservation manager) should be circulated to other parties working on the species and copied to the Bat Specialist Group for information and publication.