Príncipe Thrush & Obô Snail Monitoring Protocol

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INTRODUCTION

PURPOSE

Estimation of population sizes and monitoring of population trends are important for determining the conservation status of a species, and for assessing and improving management decisions. In Príncipe Island, focal terrestrial animal taxa for conservation include the Príncipe Thrush (*Turdus xanthorhynchus*) and the Obô Land Snail (*Archachatina bicarinata*). The Príncipe Thrush is currently the only species on the Island with a conservation action plan (BirdLife International 2014), which includes obtaining an "accurate and updated estimate of population size" and "implementation of a regular monitoring programme" as a high priority action. The purpose of this protocol document is to establish an appropriate survey design – containing detailed instructions for data collection, management, and reporting that fit the local environment, capacity, and resources - which can be used to update population estimates for the Príncipe Thrush and the Obô Land Snail, and monitor for changes in their populations through time.

BACKGROUND

Following its recognition as a distinct species in 2010 (Melo et al. 2010), the Príncipe Thrush was classified as Critically Endangered on the IUCN Red List. This was based in part on a population estimate of 364 birds (95% CI's 186-887), obtained from a 2007 survey that used distance sampling for 11 records obtained in 177 point locations (Dallimer et al. 2010). While useful, this estimate came with some limitations: assumptions about the area of occurrence and a relationship between density and elevation were made with sparse data; and the detection function used in the distance analysis was based on the São Tomé Thrush, due to insufficient records of the Príncipe Thrush. The use of a non-specific detection function will likely have affected density estimates, as the two species have notable differences in behaviour and habitat utilization, both of which can influence detectability. Obtaining an updated population estimate and developing a method for monitoring the Príncipe Thrush population were consequently included as a high priority action in the 2014-18 conservation action plan (BirdLife International 2014).

In April 2018, Fauna & Flora International (FFI) and Fundação Príncipe initiated a two and a half year project to implement and renew the conservation action plan for the Príncipe Thrush. To attempt to update the population estimate, between July 2018 and March 2019 they conducted ten minute bird counts at over 750 point locations spanning the entire island (five points in each of the islands 1km grid squares). However, although more than 30 thrush were encountered during the fieldwork, only three individuals occurred within the point locations. This was too few to allow for an estimate of the population, and so an alternative survey design is now required.

Fundação Príncipe have also recently been collecting field data on the Obô Giant Land Snail (*Archachatina bicarinata*), which is endemic to the forests of São Tomé and Príncipe Islands. This snail has cultural significance, and was recently identified as one of four key indicator taxa for the Parque Natural do Principe (Fundação Príncipe 2019a). It was classified as Vulnerable on the IUCN Red List in 1996, but has since experienced notable declines in range and numbers on both islands (Dallimer and Melo 2010), and work to update the status and develop a conservation action plan is currently underway. Recent fieldwork (Fundação Príncipe 2019b) and previous studies (e.g. Dallimer and Melo 2010) suggest that the distribution on Príncipe is similar to that of the thrush, occurring only within forests in the south of the Island. Based on their mutual status as conservation priority species, and their overlapping distributions, it is desirable that a new survey design can be applied to both species. Furthermore, the West African Giant Land Snail (*Archachatina marginata*) has become established in Príncipe and is considered a potential threat to the Obô Snail through competition and disease transmission. Including this species in a new survey design would be useful for better understanding and monitoring any increase in this threat.

METHODOLOGICAL CONSIDERATIONS

Through discussions with the Fundação Príncipe terrestrial biodiversity team, and other expert stakeholders, the following methodological considerations were identified:

- Fundação Príncipe is well placed to lead on the establishment and initial coordination of surveys, and should investigate options for securing ongoing funding. Responsibility should eventually be transferred to the Parque Natural do Príncipe, potentially with ongoing technical support from Fundação Príncipe.

- Encountering sufficient individuals to make meaningful population estimates is fundamental to the success of the survey, but may be challenging, particularly for the Príncipe Thrush. Encounters could be promoted by: maximising the number or length of sampling units; conducting surveys at times of peak activity, e.g. early mornings; and by avoiding conditions that may inhibit detection, such as during rainfall or wind, when birds may be less vocal, and the ability of surveyors to see/hear is reduced.
- The timing of survey rounds should aim to capture/account for seasonal variation in activity and distributions, but must also be practical – e.g. avoiding periods when heavy rainfall may prevent access to field sites. Survey rounds should be conducted at the same/similar times each year to ensure comparability of results. The timing of sampling units within survey rounds should also be standardised to ensure comparability – e.g. restricted to certain period(s) of the day.
- Distance sampling (Thomas et al. 2010) is a useful technique that can potentially be applied to both the Príncipe Thrush and the Obô Snail. Species specific detection functions are essential, which can be established cumulatively during the new survey, and potentially also by incorporating existing distance based records– e.g. the point locations used for original population estimate (Dallimer et al. 2010). Surveyors would require specific training in order to implement distance sampling technique. Based on encounters during recent fieldwork, the distances for most sightings are likely to be less than 30m, and laser rangefinders may not perform well at these distances, unless they are very expensive high-spec models. Surveyor's tapes (50m) offer a low tech alternative that should work well.
- Surveys are likely to be conducted/coordinated by individuals that lack formal scientific training. The survey design should take this into account, and the protocol should be simple and comprehensive, including standardised procedures, and covering all stages – from training and preparation through to data collection, analyses and reporting. Specific practical training will be necessary, and it may be beneficial to introduce an assessment and certification scheme, such that surveyors must demonstrate competence at the necessary skills before commencing surveys.
- Point count based methods are widely used for bird monitoring, but a recent attempt was ineffective for studying the Príncipe Thrush, and the method is not readily applicable to the Obô Land Snail. A line transect method is expected to be more suitable, whereby observers move along a predetermined fixed route at a constant pace, and record birds and snails seen or heard on either side of the route. Transects should ideally be placed randomly, but this is unfeasible in the south of Príncipe where there are many steep cliffs and other obstacles. Also, given the low densities of the focal species, it will be important to maximise the length of transects covered, but establishing long transects (i.e. >1km) will again be unfeasible given the terrain, and would also introduce issues of maintenance. A pragmatic option may be to utilise existing footpaths (provided they are rarely used by people or vehicles), which circumvent extreme terrain, and would allow surveyors to spend less time looking at the ground to avoid tripping over, and focus more on looking for the focal species (Senyatso et al. 2008).

PROTOCOL

Based on the aims and methodological considerations described above, the following protocol is proposed:

1. TIMING

There will be two survey rounds each calendar year from 2019, one in June and one in December. Experience from a first survey round and previous fieldwork suggests that field sites are accessible and both species are visible and vocally active (thrush only) during these months. The timing of the survey round within a month can vary based on convenience of logistics and availability of personnel, but once initiated the round should be completed within 12 days (or as few days as weather conditions allow). If a survey round cannot be conducted within the designated month, it should be completed as soon after as is possible, and subsequent survey rounds should revert to the original schedule – e.g. if a survey scheduled for June were to be postponed until August, the next round should still aim to take place in December. Such delays should be avoided if at all possible, as recent experience suggests that thrush visibility and calling is greatly reduced during August and September.

2. SURVEYORS

A survey round will be conducted by one or two surveyor teams. Each team shall consist of two to four persons, with pre-designated roles to be allocated by the most senior/experienced surveyor. One is assigned responsibility for Príncipe Thrush observations, one for snail observations. Data recording should be allocated to a third surveyor where possible, but can if necessary be conducted by either thrush or snail surveyor. These two to three principal surveyors must have completed basic training, as described in Appendix 1. The fourth person is optional, to assist with measurements and/or observe the other surveyors – e.g. this could be a trainee preparing to become a surveyor in future rounds; or an expert assessing whether the surveyors are accurately following the protocol.

3. EQUIPMENT

The following equipment is required by each survey team:

- 1 x GPS, containing GPX tracks of the survey transects (see section iv)
- 2 x spare batteries for GPS (this is a minimum - ideally additional spares should also be carried)
- 1 x surveyors tape measure (50m length)
- Clipboard, datasheets (see Appendix 2), and pencils
- Camera, or phone with good camera capability
- 1 x Callipers

4. TRANSECTS AND STANDARD DATA COLLECTION

The survey units are transects, which follow established but rarely used footpaths. There are five transects, named *Morro de Leste, Pico Principe, Barriga Branca, Rio São Tomé,* and *Praia Seca* (see Figure 1 for map, and Appendix 3 for details of how transects were selected). Transects should be completed as follows:

- GPX tracks of the transects are available from Fundação Príncipe, and should be installed onto GPS handsets to allow surveyors to identify routes, and start and end points.
- Each transect has a specified direction in which it should be walked (see Figure 1).
- A survey team should complete no more than one transect per day, aiming to commence at 06:00, and finish by 10:30. If there are two survey teams conducting a survey round then they may each complete one transect per day.
- Transects should not be conducted during rainfall. If it rains during a transect then the surveyors should pause until rain has completely stopped. If it is not possible to commence or finish a transect due to rainfall, then it should be abandoned, and restarted on a subsequent day.
- To complete a transect, the surveyors should record their start time on the standard data sheet (Appendix 2), and then walk slowly (1-1.5km per hour) along the entire transect, pausing only to record observations of the focal species (i.e. Príncipe Thrush, Obô Land Snail, or West African Giant Land Snail), or disturbance and threats (e.g. people encountered, traps, shotgun shells, logging, pigs and other mammals).
- The designated thrush observer should walk in front, followed by the snail observer, and then the data recorder. When one of the focal animals is encountered, the team should pause, take a GPS waypoint, measure the perpendicular distance between the transect and the initial location of each point where the animal first was seen (see Appendix 1 for more details on this), and complete an entry in the data recording sheet. If a bird is heard, but cannot be seen, then the tree from which it was calling should be estimated, and the perpendicular distance between the transect and the tree should be recorded. Any member of the team may make an observation, but the designated thrush observer should try to focus their attention on looking up and listening for bird calls, while the designated snail observer should focus on scanning the ground to either side of the transect.
- During the transect, and when approaching the transect before starting, it is important to minimise disturbance that might frighten or attract the focal animals – e.g. by talking quietly and only when absolutely necessary, and not using machetes to clear obstacles.
- When the end of a transect is reached, the end time should be recorded, and the data sheet should be photographed (in case of loss or damage).

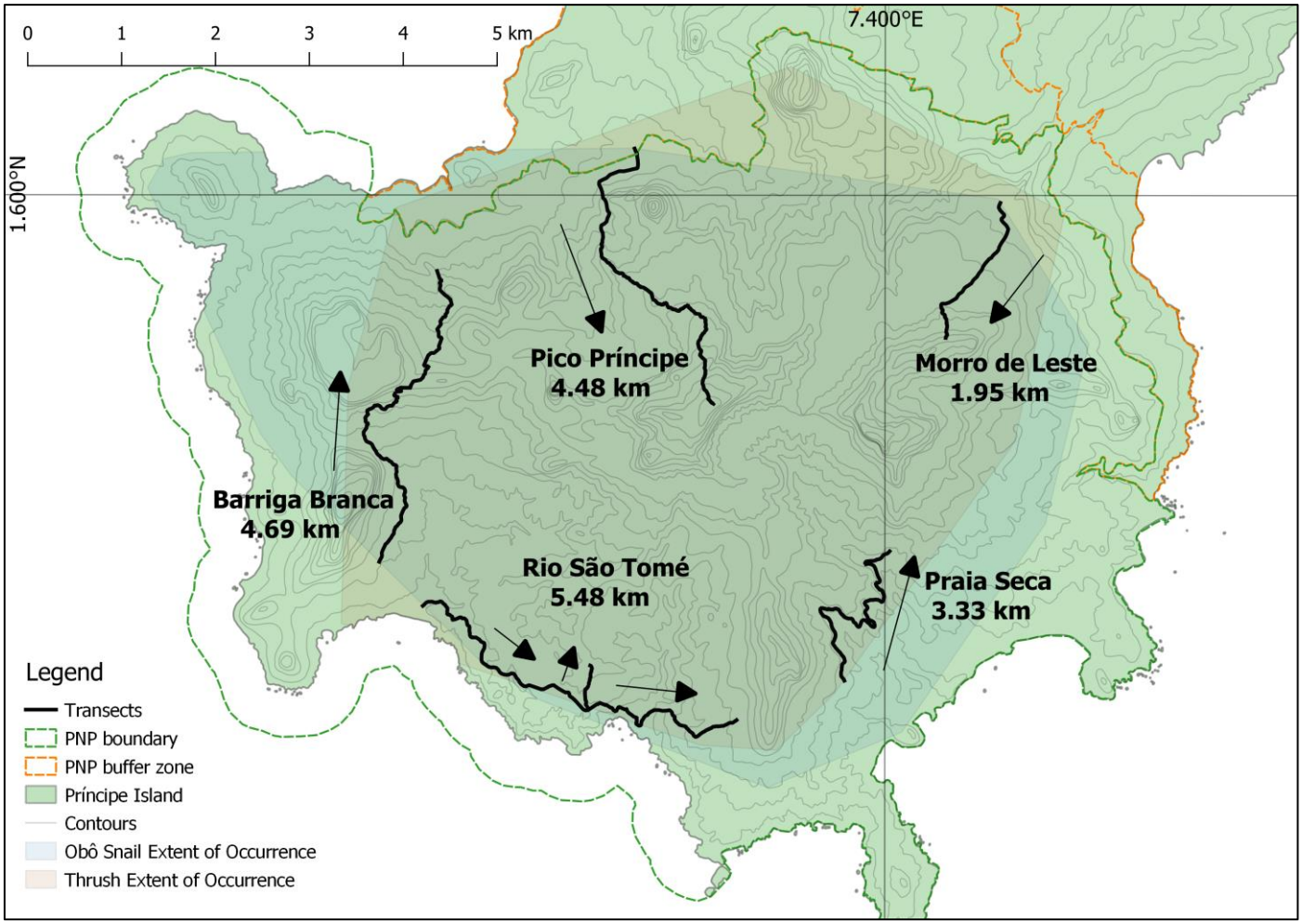

FIGURE 1 Map of monitoring transects, with arrows indicating the direction in which each transect should be completed.

5. DATA PROCESSING

Data processing shall proceed as follows:

- Data from field datasheets is entered into an excel spreadsheet by the survey team as soon as possible upon return from the field (spreadsheet entitled "*Dados de Monitoração de Tordo e Buzio yyyymmdd"*).
- Survey team invites a member of the advisory team (ideally one who is based in Príncipe at Fundação Príncipe or PNP – see also section 6. Reporting) to review the spreadsheet – i.e. by comparison with the photos of field sheets, and by plotting the coordinates to ensure that they are within transects.
- The advisory team member transfers the relevant records into a Distance software project(s) to update the species distance functions.
- Advisory team member provides feedback to the survey team, including any mistakes made during data collection or transcription, and providing updated information from Distance software.
- Survey team input summary of data into report template (see following section).

6. REPORTING

Brief reports shall be produced by the surveyors following each survey round (the template for the brief report is shown in Appendix 4). These shall be made publically available via the Fundação Príncipe and PNP websites and/or social media pages, and also circulated via email to the advisory panel and stakeholders detailed in section 7. Observations of the Príncipe Thrush shall be submitted to e-Bird following each survey round. A more detailed report – ideally containing updated population and/or distribution estimates for the focal species – shall be produced and made publically available by Fundação Príncipe in January-April 2020, following completion of the first two survey rounds. If the survey design is validated (see section 8. Review), then it should be aimed to produce further detailed reports with analyses of population trends at subsequent five year intervals.

7. ADVISORY PANEL AND OTHER STAKEHOLDERS

To promote robustness of the monitoring programme, an advisory panel of interested scientists has been established to provide comments on data, reports, plans, etc. as they come through. Members of the panel (listed below) have access to documents via an online folder (Dropbox or equivalent), including images of field data sheets and the data spreadsheet (see section 5), Distance project(s), and activity and training reports.

Other important stakeholder institutions/positions are identified below. Surveyors (and/or members of the advisory panel) should review these stakeholders and their contact details following each survey round, and ensure that they receive an email copy of all reports.

Advisory Panel:

- Tania Bird
- Frazer Sinclair
- Guilherme Rebelo
- Hugo Sampaio
- Jorge Palmeirim
- Marion Tafani
- Martim Melo
- Martin Dallimer
- Martina Panisi
- Ricardo Lima

Stakeholders:

- Secretariat of Natural Resources and the Environment, Príncipe
- Department of Biosphere Reserve and Príncipe Natural Park
- Príncipe Natural Park
- Fundação Príncipe
- Fauna & Flora International
- BirdLife International
- Critical Ecosystem Partnership Fund

8. REVIEW

This survey design is based on consideration of recent field studies of the focal species, and limitations imposed by the local environment, resources, and capacity. It is envisioned that sufficient individuals of the Príncipe Thrush and Obô Snail will be encountered during the initial two survey rounds to allow for reliable population estimates, and that subsequent rounds will allow for further estimates and monitoring of population trends. If so, then the survey can continue largely unchanged, as consistency of method is important for accurately assessing trends. However, if the numbers of encounters result in only limited power to detect change, then continuing may not be justifiable, and a larger overhaul of the method may be required. A suggested timetable for review is as follows:

- July 2019. Brief review following first survey round, expected to result in minor updates based on lessons learned during training, field work, and data processing. To be conducted by Fundação Príncipe. No fundamental changes are likely at this point.
- January-April 2020. Detailed review of survey design, to accompany report of results from first two survey rounds, to be conducted by Fundação Príncipe. Will ideally include a power analyses to better understand the potential for detecting future population trends. Major changes may be required at this point if the existing design is found to be unsuitable for achieving population estimates and monitoring of trends.

- January-April 2025, and subsequent five-year intervals. If the initial detailed review validated the survey design, then subsequent reviews should be brief, and timed to coincide with the detailed analyse of results. Fundamental changes should be avoided to preserve the consistency of the survey design. Responsibility for review shall be assumed by the surveyors implementing the surveys – expected to be from Parque Natural do Príncipe, with support from Fundação Príncipe where necessary.

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APPENDIX 1. TRAINING

Surveyors should receive instruction and demonstrate competence in the following:

GPS USE

- Basic operation – e.g. changing batteries, navigating through screens, changing simple settings etc.
- Taking waypoints and reading their coordinates
- Using the map screen to navigate to a target location – e.g. the start of a transect

MONITORING DATASHEET

- Use of datasheet - i.e. understanding the purpose of the various boxes and columns, and how to correctly enter information
- How to use the comments column and the rear of the sheet to record any ecological observations about the focal taxa, or any observations of disturbance or threats (e.g. people encountered, traps, shotgun shells, logging, pigs and other mammals etc).

FIELD IDENTIFICATION OF PRÍNCIPE THRUSH AND GIANT SNAILS

- Visual and audio recognition of the Príncipe Thrush, including its three known vocalisations
- Ability to locate and distinguish between Obô snail and West African Giant land snail (e.g. using ID sheet).

DISTANCE SAMPLING

- How to measure distances using a surveyors tape, and record the resulting measurements – i.e. includes being able to understand decimal numbers and measurement units (m, cm, mm).
- How to identify / estimate the location of a target animal at the point where it was first detected. This is straightforward for sightings of static animals, but can be more challenging when: (i) an animal is moving when sighted – in which case the surveyor should estimate the point at which they first observed it; or (ii) if a bird etc. is heard but not seen - in which case the surveyor should estimate the tree from which the bird was calling and then measure the distance to the trunk of the tree.
- How to decide which distance to measure – i.e. the shortest perpendicular distance between the mid-point of the trail/transect and the location of the target animal (see figure 2.).

EXCEL SPREADSHEET (not essential for all surveyors, but at least one per monitoring round)

- Basic operation of MS Excel – e.g. locating, opening, editing, and saving documents
- Purpose of the different worksheets – e.g. for separating thrush and snail records
- Use of spreadsheet – i.e. which information to enter where

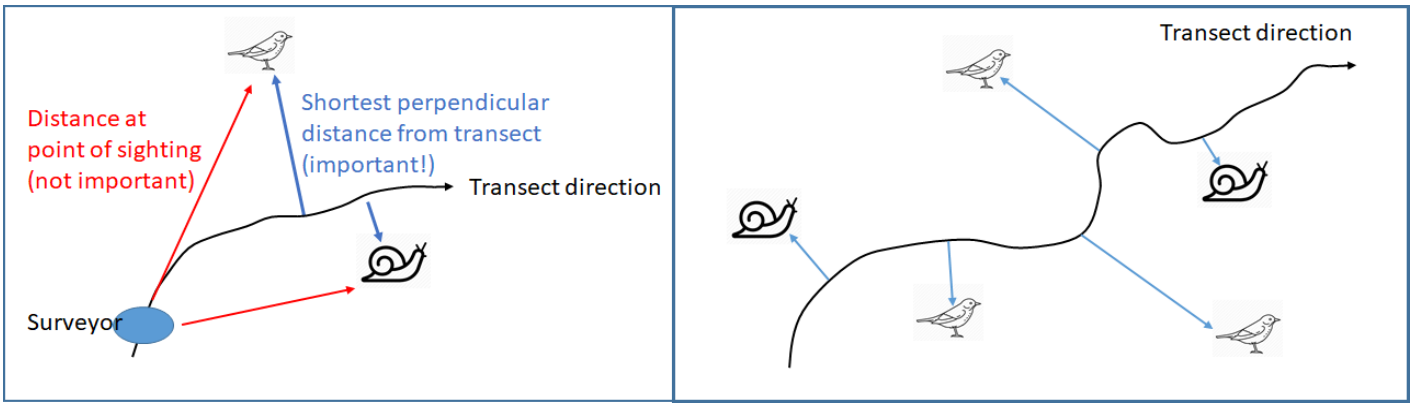


FIGURE 2 Illustration of which is the correct distance to measure – i.e. the shortest perpendicular distance between the transect and the location of the target animal (left), with examples (right).

APPENDIX 2. DATASHEET

Version 13/08/2019

Monitoração de Tordo do Príncipe

e Buzio-d' Obô

Folha __ de __

Transecto:	
Data:	
Hora de inicio:	
Hora de termina:	
ID de GPS:	

Observador	**Função?**
1.	
2.	
3.	
4.	

Hora	Ponto de GPS	Lat N.	Lon E.	Elev. (m)	Taxa				Distancia do transecto (m)	Ameaça? Use a coluna de comentários e no verso da página	Tordo		Buzio			Numero de commentario escreva quaisquer comentários ou outras observações no verso da página
					Tordo	Buzio do Obô	Buzio vermelho	Quem viu?			Visto?	Ouviu?	Vivo?	Activo?	Comprimento (cm)	

APPENDIX 3. TRANSECT SELECTION

1. Polygon vector layers for the extent of occurrence for the Príncipe Thrush and Obô land snail were obtained from datasets of known records by applying the *Dalaunay Triangulation* and *Dissolve* functions in QGIS, and then cropping to the island's coastline (see figure 3.1).
2. GPS tracks of all known footpaths within the PNP were viewed in QGIS, and any sections that did not overlap with both of the extent of occurrence polygons, or that were less than 1km in length, were removed by hand. The following tracks were retained:
    - Morro de Leste – following a 1.95 km section of trail through native forest, climbing steadily towards Pico Morro de Leste, ending at a steep cliff.
    - Pico Príncipe – following the southernmost 4.5km section of a footpath between the village of São Joaquim and the highest point of Pico Príncipe. Route begins in secondary forest at ~130m elevation and climbs steeply along ridges through native forest, reaching cloud forest towards the peak (~960m).
    - Rio São Tomé – mostly following a section of footpath along the south coast between Rio São Tomé to Rio Porco, but including two sections (towards middle and end) that penetrate inwards through native forest along old but still clearly marked research transects.
    - Barriga Branca – following a section of footpath that runs to the east of Pico Barriga Branca, climbs the saddle to the east of Pico Mesa, and then descends towards Roça Maria Correia
    - Praia Seca – a section of footpath along a terrace (an abandoned railway line) that follows a 150m contour through steep terrain, with native forest ascending to the left, and secondary forest descending steeply to the right.

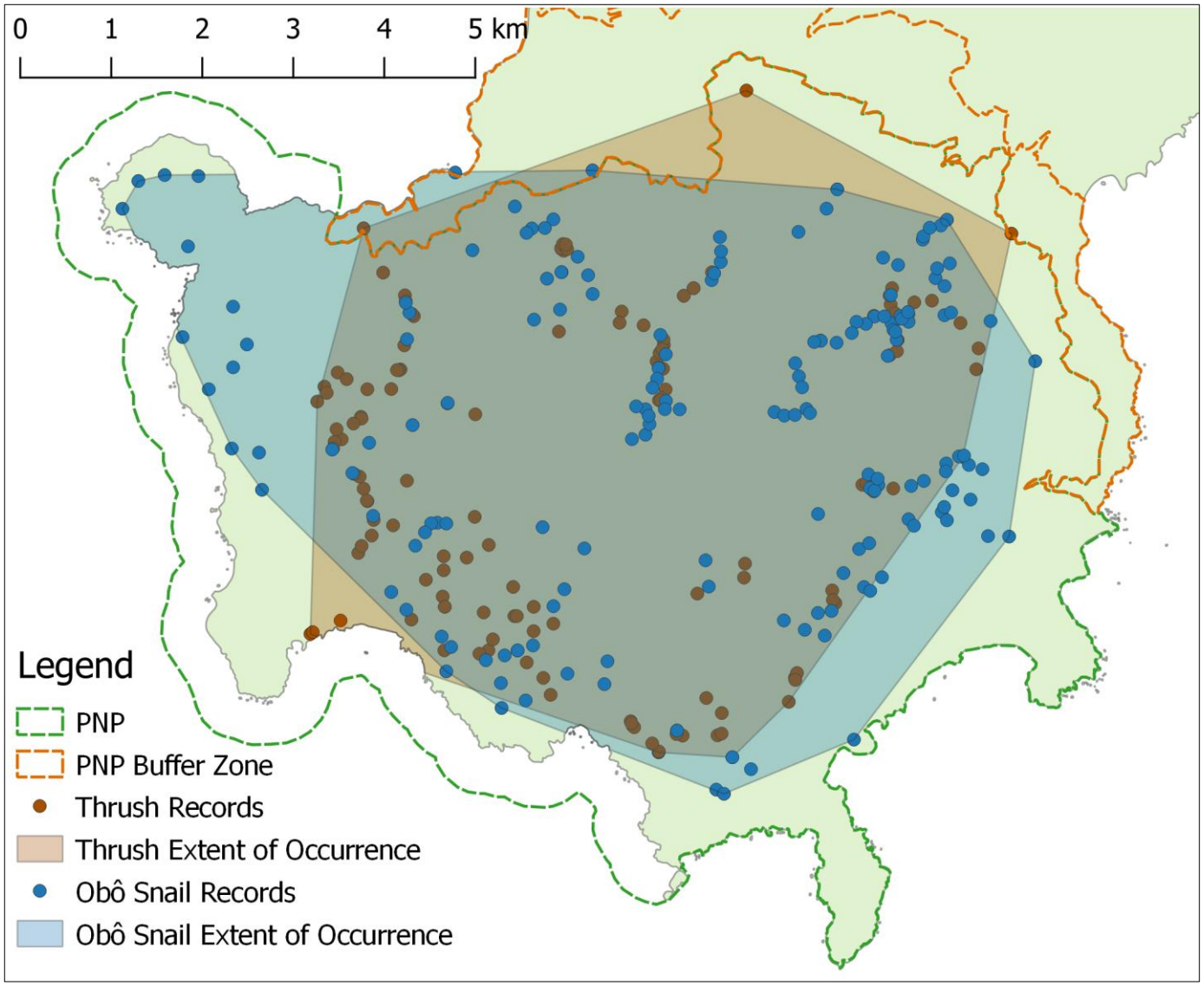


FIGURE 3.1 **Map of records and extent of occurrence (EOO) for Príncipe Thrush and Obô Snail .**

3. To test whether the transects are a good representation of the extent of occurrence of the Príncipe Thrush and Obô snail, a random sample of 50 points within each of the extent of occurrence layers was obtained using the *Random points inside polygons* function, with a minimum distance of 95m between points (95m is the approximate width of pixels in the underlying raster layers, so this specification ensures that multiple points do not occupy the same pixel). The corresponding values from the following environmental raster layers were associated with the points using the *Point sampling tool* plugin:
    - Altitude – based on a Digital Elevation Model based on NASA's Shuttle Radar Topography Mission (SRTM) with 92.4227 meters of horizontal resolution
    - Distance to coast – the minimum linear distance between each pixel and the nearest point on the coast line
    - Rainfall – based on a vectorised map of 30 years of compiled data, later smoothed with a circular filter of 20 pixels radius
    - Remoteness – cost accumulated surface derived from slope and weighted by population density
    - Ruggedness – Index calculated from the Digital Elevation Model
    - Slope – calculated from the Digital Elevation Model
    - Topography – Index in relation to the mean elevation of pixels within a 250 metre radius
    - Land use – classification with four levels (Native forest, Secondary forest, Shade plantation, and Non-forest), derived from botanic field data, historic maps, and current satellite imagery.
4. For the transects, GPX tracks were converted to line vector format in QGIS, and lines were merged into a single feature. A polygon vector file encompassing the transects was generated using the *Buffer* function with a distance of ten metres. A random sample of 50 points within the transect polygon layer, and corresponding values from the raster layers, was generated as described in step 3.
5. The samples from steps 3 & 4 were compared using two sided Wilcoxon tests (for continuous variables, i.e. a-g from the list in step 2), and Chi-squared tests (for the categorical Land use variable), conducted in R version 3.5.1. The probabilities that samples are equivalent are shown in Table 1. These indicate that for most variables there are not differences between the samples for the transects and either of the extents of occurrence, or between the two extents of occurrence. There is some suggestion that the distance to the coast, and Land use for the transects may differ from the Príncipe Thrush extent of occurrence, and that the slope for the transects may differ from both the Príncipe Thrush and Obô snail extents of occurrence, but these cease to be significant after Bonferroni correction for multiple hypotheses testing (corrected 95% p-value = 0.05/16 = 0.00313). We therefore consider that the selected transects are a valid representation of the area occupied by the two focal species.

Comparison	Altitude	Distance to coast	Rainfall	Remoteness	Ruggedness	Slope	Topography 250m	Land use
Thrush vs Transects	0.3107	0.0120*	0.9050	0.4811	0.0883	0.0239*	0.7438	0.0285*
Obô snail vs Transects	0.3685	0.0515	0.9687	0.8906	0.1711	0.0255*	0.9103	0.3822
Thrush vs Obô snail	0.9511	0.6524	0.9340	0.4083	0.6525	0.8670	0.6250	0.1931

TABLE 1 P-values from Wilcoxon tests (columns 2-8) and Chi-squared tests (column 9) comparing environmental variables for samples of points within the survey transects and the area of occupancies for the Príncipe thrush and Obô snail. Values of less than 0.05 indicate a significant difference at the 95% confidence threshold (before correction for multiple tests), and are highlighted in bold.

APPENDIX 4. MONITORING REPORT

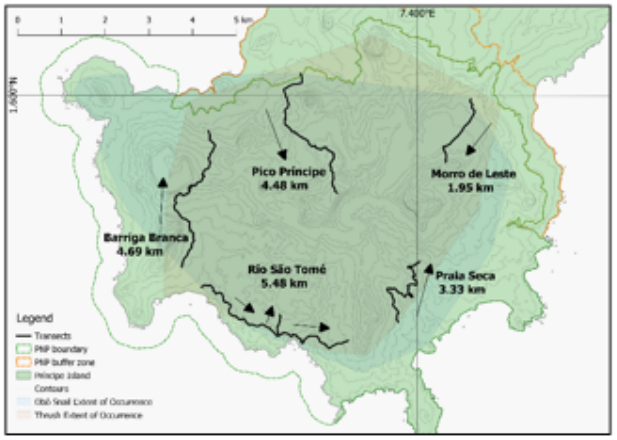
Relatório de Monitoramento do Tordo do Príncipe & Buzio do Obô

Date / *Data*:		**Prepared by /** *Preparado por*:	

Background / *Contexto*

The Príncipe Thrush and Obô Snail are priority species for conservation within the Parque Natural do Príncipe. A monitoring programme has been established for these species, which involves completing a series of 5 transects at 6-month intervals from June 2019. This brief report, following a fixed template, is intended to communicate the results of each monitoring round to stakeholders and the wider public.

O Tordo do Príncipe e o Buzio d' Obô são espécies prioritárias para a conservação no Parque Natural do Príncipe. Um programa de monitorização foi estabelecido para essas espécies, o que envolve a realização de uma série de 5 transectos, em intervalos de 6 meses, a partir de Junho de 2019. Este breve relatório, seguindo um modelo fixo, destina-se a comunicar publicamente os resultados de cada rodada de monitorização.



Survey details / *Detalhes da pesquisa*

Surveyors / *Investigador*	
Leader / *Líder*	

Start Date / Data de início:	
End Date / Data final	

Data reviewed by / *Dados revisados por:*

Distance function available? * Função de distância disponível? *	**Príncipe Thrush** / Tordo do Príncipe	**Obô Snail** / Buzio do Obô

Results / *Resultados*

Transect *Transecto*	**Length (km)** *Comprimento*	**Survey date** *Data*	**No. of Thrush** *Número de Tordos*	**Density per Ha*** *Densidade por Ha*	**No. of Obô snail** *Número de Buzios do Obô*		**Density per Ha** *Densidade por Ha*
					Alive *Vivos*	**Shells** *Cascas*	
Morro de Leste	1.95						
Pico Príncipe	4.48						
Barriga Branca	4.69						
Rio São Tomé	5.48						
Praia Seca	3.99						
Total	20.59						

*Densities are based on a species specific survey distance function, derived from field data, that is used to estimate the area covered by a transect. The estimation of a distance function requires ~30 records, and so is unlikely to be available during the initial survey rounds.

**As densidades são baseadas em uma "função de distância de levantamento" específica da espécie, derivada de dados de campo, que é usada para estimar a área coberta por um transecto. A estimativa de uma "função de distância" requer aproximadamente 30 registros e, portanto, é improvável que esteja disponível durante as rodadas iniciais da pesquisa.*

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The project is being implemented on Príncipe Island by Fundação Príncipe, who are operating the following grievance safeguard procedure:

Fundação Príncipe is committed to hearing and resolving any grievances raised by its stakeholders, and we have developed a specific mechanism to help us with this. A document describing the mechanism is available on our website and on request from our office in Santo Antonio. If you have any concerns about Fundação Príncipe's actions or activities, then please get in touch in the following ways:

- *By telephone – The Fundação Príncipe telephone number is +239 9803640*
- *By Email - An electronic copy of our grievance lodgement form is available online at www.fundacaoprincipe.org, and completed forms or messages can be sent to info@fundacaoprincipe.org.*
- *Face to face - Stakeholders can voice their grievance to any Fundação Príncipe employee who will then escalate using the correct process.*
- *Through mediating organisations – If you prefer not to directly contact the Fundação Príncipe, or are unhappy with how your grievance was handled, then you can speak to any staff member from the Department of Environment and Nature Conservation – either at their offices in Santo Antonio, or by telephone on +239 2251142.*
- *Directly to the project donor - Critical Ecosystem Partnership Fund - via email: cepfexecutive@conservation.org.*

FOR MORE INFORMATION:

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