<table>
<thead>
<tr>
<th><strong>CLP Project</strong></th>
<th>ID Code F210308</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project Title</strong></td>
<td>A Conservation Framework for <em>Furcifer</em> Chameleons in Madagascar</td>
</tr>
<tr>
<td><strong>Host country</strong></td>
<td>Madagascar</td>
</tr>
</tbody>
</table>
| **Site location** | - Ankaratra massif (Central highland)  
- Bongolava Forest corridor (North-Western)  
- Belalanda and Sakabera (South-Western)  
- Angavokely Forestry Station (Central highland)  
- Tsitongambarika Forest (South-Eastern) |
| **Dates in the field** | - October 2008 (in Belalanda and Sakabera)  
- November-December 2008 (in Ankaratra massif)  
- March-April 2009 (in Belalanda and Sakabera)  
- October 2009 (in Ankaratra massif)  
- November-December 2009 (in Belalanda and Sakabera)  
- November 2009 (in Tsitongambarika Forest)  
- January 2010 (in Ankaratra Massif)  
- March 2010 (in Bongolava forest) |
| **Institutions partners** | - Conservation International Madagascar)  
- World Wildlife Fund Madagascar West Indian Ocean region (WWF MWIO)  
- International Union for Conservation of Nature (IUCN)  
- Department of Animal Biology Antananarivo University Madagascar (DBA-UA)  
- Département des Sciences Biologiques Tulear University (DSB-TU)  
- Durrell Institute of Conservation and Ecology (DICE)  
- Direction de la Valorisation des Ressources Naturelles of Ministry of Environment and Forests Madagascar (DVRN/MEF)  
- Direction de la Conservation de la Biodiversité et du Système des Aires Protégées of Ministry of Environment and Forests Madagascar (DCBSAP/MEF) |
| **Project Aim** | To conserve the endemic *Furcifer* chameleons of Madagascar |
| **Authors** | - Christian Joseph RANDRIANANTOANDRO  
- Raphali Rodlis ANDRIANTSIMANARILAFY  
- Roma RANDRIANAVELONA |
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- arraphali@gmail.com / raphalivaovao@yahoo.fr  
- romagasy2@moov.mg |
| **Website** | [www.madagasikara-voakajy.org](http://www.madagasikara-voakajy.org) |
| **Date of reporting** | January 2011 |
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Acknowledgements

This project was financially supported by the Conservation Leadership Programme, and we received welcome additional funding from Conservation International Madagascar, British Herpetological Society, Mohamed Bin Zayed Species Conservation Fund, British Embassy to Madagascar, Chameleons studios, Calumma Ecological Services, and Darwin Initiative.

We are indebted to the Département des Sciences Biologiques, University of Tulear, Département de Biologie Animale University of Antananarivo Madagascar, and the Durrell Institute of Conservation and Ecology University of Kent United Kingdom.

Thanks also to Tiana Ramahaleo, Bernardin Rasolonandrasana, Eric Rasolondranaly from World Wildlife Fund Madagascar and West Indian Ocean Programme Office Antananarivo and Tulear on for logistical support.

We are also grateful to the local authorities: Mayors of the communes Belalanda and Tulear II, Tsiafajavona-Ankaratra, Tsiningia and Tsarahasina, and Ifarantsa, Chiefs fokontany and to the local communities of Andraraty, Sakabera and Belalanda, Andranomena II and Marosely, and Ivorona.

We would like to thank also the Antananarivo and Tulear Universities students: Mihanta Raholdina Andriaefananana, Djadagn’Ahy Philibertin Honoré, Patricia Soloniaina Mamory, Ravo Benjanahary for their hard work in the field.

We are grateful to the local guides: Rafenomanana, Evariste Rakotondrabako, Evariste Rafenoarson, Rakotoarison Heritina and to the local cooker Rabakoarijaona Heritina from the Ankaratra massif, Luduger Randrianjaka, Olivier Randrianirina from Belalanda and Sakabera, Laosy, Pery, Resaka, Clement Berson, Augustin, Tsarazoro, Honoré Rabemananjara, Donny Rabemananjery, and the local cooker Andriamandrosa Daniel from the Bongolava forest, Razafinambinina Angelus Emilon, Ravelonandrasana Rubain, Damy Gustave, Mara Roger and Kamily from the Tsitongambarika forest, and also to the porters from the Ankaratra massif managed by Randriamiarintsoa Ernest for their invaluable help during fieldwork.

We are also indebted to all contributors giving particularity to Richard Jenkins, Chris Raxworthy, Frank Glaw, Jörn Köhler, Miguel Vences, Neil Cox, Kristopher Karsten, Angus Carpenter, Jean Noel and An Bollen for their comments on the Furcifer species accounts.

We would like to thank the Ministry of Environment and Forests of Madagascar for permission to carry out field research.
### Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>AZE</td>
<td>Alliance for Zero Extinction</td>
</tr>
<tr>
<td>BFC</td>
<td>Bongolava Forest Corridor</td>
</tr>
<tr>
<td>BP</td>
<td>British Petroleum</td>
</tr>
<tr>
<td>CEF</td>
<td>Chef Cantonnement Forêts</td>
</tr>
<tr>
<td>CEL</td>
<td>Centre Ecologique Libanona</td>
</tr>
<tr>
<td>CI</td>
<td>Conservation International Madagascar</td>
</tr>
<tr>
<td>CITES</td>
<td>Convention International on Trade of Threatened Species</td>
</tr>
<tr>
<td>CIRÉF</td>
<td>Circonscription de l’Environnement et Forêts</td>
</tr>
<tr>
<td>CLP</td>
<td>Conservation Leadership Programme</td>
</tr>
<tr>
<td>DBA-UA</td>
<td>Département de Biologie Animale University of Antananarivo</td>
</tr>
<tr>
<td>DICE</td>
<td>Durrell Institute for Conservation and Ecology</td>
</tr>
<tr>
<td>DREF</td>
<td>Direction Régionale de l’Environnement et des Forêts</td>
</tr>
<tr>
<td>DSB-UT</td>
<td>Département des Sciences Biologiques University of Tulear</td>
</tr>
<tr>
<td>DS</td>
<td>Distance Sampling</td>
</tr>
<tr>
<td>DVRN</td>
<td>Direction de la Valorisation des Ressources Naturelles</td>
</tr>
<tr>
<td>FIMAB</td>
<td>Fikambanana Miaro ny Ala sy ny Biby</td>
</tr>
<tr>
<td>FITAMITO</td>
<td>Fikambanan'ny Tantsaha Miaro ny Tontolo iainana</td>
</tr>
<tr>
<td>GIS</td>
<td>Geographic Information System</td>
</tr>
<tr>
<td>GPS</td>
<td>Global Positioning System</td>
</tr>
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<td>IUCN</td>
<td>International Union for Conservation of Nature</td>
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<td>MA</td>
<td>Management Authority CITES Madagascar</td>
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<td>MEF</td>
<td>Ministry of Environment and Forests</td>
</tr>
<tr>
<td>MNP</td>
<td>Madagascar National Parks</td>
</tr>
<tr>
<td>MV</td>
<td>Madagasikara Voakajy</td>
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<tr>
<td>NAP</td>
<td>New Protected Area</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-Gouvernemental Organisation</td>
</tr>
<tr>
<td>PK32</td>
<td>Point Kilométrique 32</td>
</tr>
<tr>
<td>REBIOMA</td>
<td>Réseaux de la Biodiversité de Madagascar</td>
</tr>
<tr>
<td>SA</td>
<td>Scientific Authority Fauna CITES</td>
</tr>
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<td>SAPM</td>
<td>Système d’Aires Protégées de Madagascar</td>
</tr>
<tr>
<td>VIF</td>
<td>Vondron’Ifotony Fampandrosoana</td>
</tr>
<tr>
<td>VOI</td>
<td>Vondron’Olona Ifotony</td>
</tr>
<tr>
<td>WWF</td>
<td>World Wildlife Fund</td>
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</tbody>
</table>
Section 1

Summary

This project aimed to conserve the chameleons in the genus *Furcifer* of Madagascar.

We completed preliminary species accounts all Malagasy *Furcifer* species in 2009 and these were reviewed in an expert workshop held in Antananarivo in January 2011. Provisional results from the workshop listed one Critically Endangered species (*Furcifer belalandaensis*), three Endangered, five Vulnerable, one Near Threatened, seven Least Concern and one Data Deficient. This list will undergo a consistency check by the IUCN before submission to the Red List Authority Focal Point for chameleons and eventual publication on the IUCN Red List of Threatened Species website later in 2011.

*Furcifer belalandaensis* was identified as priority species for conservation. This species occurs only in Belalanda and Sakabera, two small villages, situated outside of the protected area system in Madagascar. Following several meetings with the protected area planning group and WWF Madagascar, an extension of the new protected area of PK32 Ranobe was made to sites with *F. belalandaensis*. Activities with the communities in this area resulted in the creation of two village associations for chameleon conservation. A capacity building event on chameleon identification and conservation was undertaken for the members of the two village associations in December 2010. Education activities in the primary schools focused on raising awareness about chameleons because children frequently play with, and kill, chameleons and this is a potential threat to *F. belalandaensis*. We produced bespoke posters on chameleons for use in the two villages and in the primary schools.

At Ankaratra Mountain, our survey data were used to identify potential collection sites for *Furcifer campani* and the biological information is being analyzed to explore patterns in seasonality and response to heathland fires. This work was integrated into a project to create a new protected area at this site.

We provided close support to the CITES Authorities in Madagascar and led an assessment of the capacity of different chameleon species to support modest harvests and identified which should not be traded at all. We also sponsored and trained four Malagasy students from two universities in their chameleon studies.

Chameleons are now more prominent in the minds of stakeholders than before our project started. The next steps are to improve conservation for the most threatened species and to carefully consider the resumption of trade in a few very common species that are not threatened.
Introduction

Madagascar is an island nation that is a global biodiversity hotspot. Its unique habitats are increasingly subject to pressures for new agricultural land farm and mineral extraction, and deforestation persists as a major threat to Malagasy flora and fauna. The Durban Vision process (a plan to triple the area protected in parks) is ongoing in Madagascar and new protected areas are being created. The increased demand for information about species diversity and threats, from protected area planners and mines in particular, has led to the IUCN Red List becoming of central importance. In Madagascar, information is available for all birds, mammals and amphibians but for only a tiny proportion of its reptiles. Madagascar is the international hotspot for chameleon diversity and new species continue to be described. Despite their diversity, cultural importance, role in ecotourism, commercial value as pets, small ranges and sensitivity to habitat loss, chameleons Madagascar have received little attention. This project therefore focussed on chameleons and, because there are 74 species in Madagascar, we opted to concentrate efforts on the 19 species from the genus Furcifer.

The IUCN Red List featured 3 Furcifer species prior to this project even though 5 have restricted range and 2 are possibly extinct. Conservation assessments, supported by new field studies, are therefore urgently needed for these taxa, especially F. belalandaensis which restricted to the south-west (Glaw & Vences 2007). Furcifer chameleons are sold for $US100-450 and 8,000 animals from four common species are legally exported each year. The chameleons therefore generate $US200,000 - $900,000 per year. A key part of our study is therefore to support the CITES Authorities in Madagascar with respect to the future sustainable management of Furcifer harvests.

This project will therefore provide a new impetus for chameleon conservation and will, more generally, assist the Malagasy government with its international obligations (e.g. Convention on Biological Diversity, CITES) and is aligned with the Madagascar Action Plan (MAP) launched by the ex-President in 2007 and its 7th Objective is to 'Cherish the Environment' by creating new protected areas and to valorise the biodiversity.

Figure 1. Photos of adults male (left) and female (right) of Furcifer belalandaensis. Photos Raphali Andriantsimanarilafy/Madagasikara Voakajy.
**Figure 2:** Maps of the five study sites: Belalanda-Sakabera in the south-western, Ankaratra massif, and Angavokely Forestry Station in the central highland, Bongolava forest in the north-western, and Tsitongambarika in the south-eastern Madagascar.
Project members

Christian J. Randrianantoandro

Relevant qualifications and experiences: I undertook my masters (DEA) research project on chameleon ecology in 1998 and completed the degree in 2002. I led a field team in a survey of geckos and chameleons for six months in the Anosy region during 2002. I was also a consultant for four months on a herpetological survey of the new protected area of Makira with the Wildlife Conservation Society in 2003. Since 2005 I have led the herpetofaunal conservation programme at Madegasikara Voakajy. I have previously successfully submitted two Red List assessments Phelsuma antanosy (Critically Endangered) and Pseudoxyrhopus kely (Endangered) in 2006. I wrote publications concerning roost sites characteristic of Brookesia chameleon species from Tsingy de Bemaraha National Park that, and identifying important areas for the conservation of dwarf chameleons (Brookesia spp.) in Tsingy de Bemaraha National Park, western Madagascar recently published in the Amphibia-Reptilia and Oryx journals. In 2006, I was the team leader of anFuture Conservationist Award on a chameleon project funded by CLP and I attended the international training course in the UK. I participated in, and gave an oral presentation about chameleons during the International Menabe Research Group Meeting in 2006 and 2007. With the support from CLP, I participated in the SCB 2007 annual meeting in South-Africa and gave a poster presentation on chameleon survey and monitoring in the Tsingy de Bemaraha National Park funded by Darwin Initiative and Calumma Ecological Services.

Current occupation: I am currently co-supervising five Malagasy masters’ student projects on chameleons and coordinate research, surveys and training in south-western, south-eastern, north-western, and central highland Madagascar for Madagasikara Voakajy.

Main role in the project: Team Leader

Roma Randrianavelona

Relevant qualifications and experiences: Roma’s masters research was on the behaviour of Zonosaurus plated lizard community from Kirindy CFPF Forests western Madagascar. Roma participated in the training offered by Tropical Biological Association in Kenya during 2003 and received an Earthwatch Fellowship to visit South African in 2004. In 2006, he participated in herpetofauna research and chameleon monitoring in Tsingy de Bemaraha National Park. Then he conducted a conservation education project for the staff and guides working in this national park. He contributed to my scientific paper published in Amphibia-Reptilia about roost sites characteristic of sympatric dwarf chameleons from western Madagascar in 2007. He conducted a chameleon survey in Belitsaka Forest in the same year. He also conducted a survey and monitoring of the Critically Endangered Mantella aurantiaca in the Alaotra Mangoro Region in 2007 and recently received his own grant from Rufford Small Grants for this work. Roma represented the team and attended the international training course in the USA.

Current occupation: Roma worked as a herpetologist assistant with Madagasikara Voakajy NGO since 2006.

Main role in the project: Educator

Raphali R. Andriantsimanarilafy

Relevant qualifications and experiences: Raphali’s masters research was a study of the distribution and abundance of chameleons in the Tsingy de Bemaraha National Park. Raphali was a student from the University of Tulear in the south-western Madagascar. Three of the
potential study species in this project are from the area around Tulear so in addition to bringing his field work experience his knowledge of local culture, dialects and terrain were invaluable. He is dynamic in the field and an important asset to the team.

**Current occupation:** Raphali worked as researcher assistant in the herpetology program with Madagasikara Voakajy since 2007.

**Main role in the project:** Project Assistant

**Mihanta R. Andriafananona (Student)**

Mihanta master's research topic is on the ecology and habitat preference of *F. campani* in the Ankaratra Massif Central highland of Madagascar. She is a student from the DBA-UA. She received the training on research methods on chameleon by participating in the fieldwork in the Ankaratra Massif Central highland Madagascar.

**Patricia Mamory Soloniaina (Student)**

Patricia master’s research topic is on the ecology and habitat preference of *F. angeli* in the Bongolava forest corridor in the north-western Madagascar. She is a student from the DBA-UA. She received the training on research methods on chameleon by participating in the fieldwork in dry forest of Bongolava.

**Djadagny Ahy Philibertin Honoré (Student)**

Djadagny master’s research topic is on the ecology and habitat preference of chameleon species in the Belalanda and Sakabera south-western Madagascar. He is a student from the DSB-UT. He received the training on the research methods on chameleon by participating in the fieldwork in the spiny forest of Belalanda and Sakabera south-western Madagascar.

**Ravo Benjamin Benjanahary (Student)**

Ravo master’s research topic is on the ecology and habitat preference of chameleon species in the Tsitongambarika forest south-eastern Madagascar. He is a student from the DSB-UT. He received the training on the research methods on chameleon by participating in the fieldwork in Tsitongambarika rainforest south-eastern Madagascar.
Section 2

Aim and Objectives
This project aims to conserve the endemic Furcifer chameleons of Madagascar.
Five objectives of the project:
1. To conduct a Red List assessment of 19 Furcifer species.
2. To identify priority areas of conservation for Furcifer chameleons.
3. To raise the capacity of stakeholders to conserve chameleons.
4. To raise the awareness about chameleons.
5. To assess the economic importance of chameleons.

Methodology

Red List Assessment
The Red List assessment was done for Furcifer species using IUCN 2001 version 3.1 criteria by assembling information from the literature and museum voucher specimens. Distributional data (geographical coordinates and altitude), habitat requirements and threats were determined for each species. Mapping and ArcView spatial analysis were used to calculate the extent of occurrence and area of occupancy.

Field Studies
This process identified priority species (i.e. highly localized distribution, absent from protected areas, no recent observations) and fieldwork was undertaken to collect the necessary data to support the Red List assessment (e.g. exact distribution limits, impact of forest degradation, collection pressure). Methods previously used during the Future Leadership Award were used during these field studies: density and abundance were calculated using the distance sampling method, and habitat requirements were examined by establishing plots of 5 x 5 m. Photographs of chameleons taken in the field with digital cameras were used to assist identification and in the preparation of resources for education (e.g. booklet, poster).

Gap Analysis
The current distribution of all Furcifer species in western Madagascar was mapped and protected areas and areas designated for mining were overlaid to assess chameleon representation inside these areas and to identify pending large scale threats to habitat integrity. The team leader is already involved as a herpetology specialist in the Durban Vision planning process and the new information was fed into the system.

Community and Education
Local community representatives participated to the research. Based on the results of the field surveys education programmes targeted to certain sites or species were developed. These had included awareness raising in schools and with community leaders as well as strengthening the knowledge of regional ministry staff. School children will participated in activity learning and will enter competitions to produce stories, picture or songs about chameleons. These will be judged, prizes awarded and the winning entries used to promote chameleon conservation (e.g. the booklet and poster).

In important chameleon sites that already have protection we collaborated with managers to promote the conservation and monitoring of chameleons. In important chameleons sites that
are not protected we led and developed conservation plans with local villagers, invited other specialists to assess the biodiversity value of the site and work with the Malagasy government to incorporate the area within the expanding protected area network.

Malagasy student trainees were involved in all aspects of the project to learn field techniques, scientific analyses and project planning. They were supervised by a university professor and their field work will be written up as a thesis for a DEA (Masters) diploma.

**Outputs**

**Objective 1: To conduct a Red List assessment of 19 *Furcifer* species**

<table>
<thead>
<tr>
<th>Original activities &amp; indicators</th>
<th>Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compilation of species accounts and range occupancy/coverage analysis using standard IUCN criteria</td>
<td>Completed for 19 species; then sent for review to experts; final draft accounts submitted to IUCN in July 2010</td>
</tr>
<tr>
<td>Fieldwork on the habitat preference, distribution and abundance/density of selected species</td>
<td>Completed for <em>F. campani</em>, <em>F. antimena</em>, <em>F. angeli</em> and <em>F. belalandaensis</em></td>
</tr>
</tbody>
</table>

**Objective 2: To identify priority areas of conservation for *Furcifer* chameleons**

<table>
<thead>
<tr>
<th>Original activities &amp; indicators</th>
<th>Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment of the distribution of protected areas, chameleons and proposed mines</td>
<td>Completed in March 2010; list of <em>Furcifer</em> species and proportion of range within existing and planned protected areas; boundary revision made to one park under creation based on our survey results</td>
</tr>
</tbody>
</table>

**Objective 3: To raise the capacity of stakeholders to conserve chameleons**

<table>
<thead>
<tr>
<th>Original activities &amp; indicators</th>
<th>Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field visits to priority sites in protected areas to develop the capacity of reserve staff regarding chameleons</td>
<td>Information that we collected on the biology and distribution of <em>F. campani</em> was used in the initial set of workshops to develop a new protected area at Ankaratra Massif</td>
</tr>
<tr>
<td>Focus on PK32 New Protected Area where we worked with WWF to develop conservation initiatives for <em>F. belalandaensis</em>; two community associations created for chameleon conservation</td>
<td></td>
</tr>
<tr>
<td>Staff from Angavokely Forestry Station informed about chameleons, trained in survey methods and participated in research in October 2009</td>
<td></td>
</tr>
<tr>
<td>Malagasy students from two universities to receive training</td>
<td>Four Malagasy students trained during the project and received a qualification in GIS</td>
</tr>
</tbody>
</table>
**Objective 4: To raise the awareness about chameleons**

<table>
<thead>
<tr>
<th>Original activities &amp; indicators</th>
<th>Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field visits to priority sites outside of protected areas to raising awareness in rural schools using resources created during the project produce posters and booklets on chameleon</td>
<td>Focus on PK32 New Protected Area where we worked with WWF; primary school project developed with education authority and was carried out in December 2010; posters about <em>Furcifer</em> chameleons were produced and distributed to all participants in the two primary schools. We raised the profile of chameleon conservation amongst stakeholders and a post-project workshop is planned for March 2011. Chameleon poster produced and displayed at national festival for the International Day of Biodiversity and World Environment Day</td>
</tr>
</tbody>
</table>

**Objective 5: To assess the economic importance of chameleons**

<table>
<thead>
<tr>
<th>Original activities &amp; indicators</th>
<th>Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assist the CITES Scientific Authority for Madagascar to demonstrate non-detriment findings to support sustainable collection of Appendix II species</td>
<td>Reviewed <em>Furcifer</em> species for the Scientific Authority with respect to trade; identified 6 species that are potentially suitable for sustainable harvest; workshop on non-detriment findings completed. Non-detriment findings on the annual quota of two <em>Furcifer</em> species submitted to the CITES Management and Scientific Authorities in Madagascar in January 2011</td>
</tr>
<tr>
<td>To assess the potential for community-based quota and sustainable collection to promote habitat conservation</td>
<td>Field research at Ankaratra on <em>F. campani</em> focussed on obtaining biological information on this species that used to be heavily traded and is a strong candidate for resumed collection from the wild for the international pet market</td>
</tr>
</tbody>
</table>

**Results**

**Objective 1: To conduct a Red List assessment of 19 *Furcifer* species**

We compiled species accounts, including maps and a literature review, for 19 *Furcifer* chameleons and sent them by email to 59 people (Appendix 1) during January 2009. The species accounts and revised maps were then sent to IUCN in July 2010 for review. This part of the project coincided with Madagasikara Voakajy producing additional species maps and descriptions for all lizards and snakes in Madagascar for the IUCN. This resulted in significant additionality to the initial 19 species but also incurred in a delay in the Red List assessment workshop. The Red List assessment workshop took place in Antananarivo from 24th to 28th January 2011. It was co-funded by CLP, Conservation International, Mohamed Bin Zayed Species Conservation Fund and the Darwin Initiative. The workshop was attended by 32 experts, seven from overseas (UK, USA, Germany and Italy) and 25 from Madagascar,
and was facilitated by four IUCN personnel (Neil Cox, Philip Bowles, Craig Hilton-Taylor and Mike Hoffmann) (Appendix 2). Among the 18 Furcifer species evaluated, nine were classified threatened: *F. belalandaensis* as Critically Endangered, *F. minor*, *F. nicosiai*, and *F. tuzetae* as Endangered, and *F. antimena*, *F. campani*, *F. labordi*, *F. petteri*, and *F. rhinoceratus* as Vulnerable. *Furcifer timoni* was Near Threatened, and seven other species: *F. angeli*, *F. bifidus*, *F. lateralis*, *F. oustaleti*, *F. pardalis*, *F. verrucosus*, and *F. willsi* was Least Concern. Only one species, *F. balteatus* was classified as Data deficient.

The IUCN Red List uses peer-reviewed and expert opinion to determine the extinction risk for different species. Our project sought to collect new and important biological information on a number of species as a contribution to this process. We published two scientific articles on habitat preference and conservation of chameleons in dry forest and montane sites of Madagascar (Appendix 3). Other data collected from different sites are now being analyzed (Tables 1-6). These data are helping us to indentify key vegetation types for certain types of chameleons.

Perhaps the most important information is for *F. belalandaensis*. This is one of the rarest vertebrates in Madagascar and our results are now showing the importance of large, non-endemic trees for these species. These large, shade-providing, trees are located in small villages (Figure 3). In total, twenty eight observations of individuals were recorded: one in October 2008, seven in March-April 2009, seven in November-December 2009, two in March 2010, four in December 2010, and seven in January 2011.
**Table 1:** Abundance index (± SE) and calculated density by the program DISTANCE for chameleon species in the Ankaratra massif during November-December 2008.

<table>
<thead>
<tr>
<th>Species</th>
<th>AI (Nb)</th>
<th>N</th>
<th>D (ha⁻¹)</th>
<th>Model Selected by DISTANCE</th>
<th>C.V. (%)</th>
<th>C.I. (95%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Furcifer campani</em></td>
<td>1.1 ± 0.3 (47)</td>
<td>47</td>
<td>12,2</td>
<td>Uniform</td>
<td>26,6</td>
<td>7,1 – 20,9</td>
</tr>
<tr>
<td><em>Furcifer lateralis</em></td>
<td>0.5 ± 0.2 (21)</td>
<td>20</td>
<td>5,1</td>
<td>Uniform</td>
<td>47,9*</td>
<td>2,0 – 12,8</td>
</tr>
<tr>
<td><em>Calumma hilleniusi</em></td>
<td>1.5 ± 0.8 (63)</td>
<td>59</td>
<td>19,7</td>
<td>Hazard</td>
<td>56,6*</td>
<td>6,6 – 58,0</td>
</tr>
</tbody>
</table>

AI : Abundance Index (number of observation of individuals per 100 m)  
Nb : Number of observation of individuals used to calculate the abundance  
N : Number of observation of individuals adults and juveniles used to calculated the density  
D : Density  
C.V.: Coefficient of Variation  
C.I. : Confidence of interval

**Table 2:** Abundance index (± SE) and calculated density by program DISTANCE of chameleons species within each habitat type in the Ankaratra massif in November-December 2008.

<table>
<thead>
<tr>
<th>Habitat type</th>
<th>Species</th>
<th>AI (Nb)</th>
<th>N</th>
<th>D (ha⁻¹)</th>
<th>Model Selected by DISTANCE</th>
<th>C.V. (%)</th>
<th>C.I. (95 %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humid Forest</td>
<td><em>Furcifer campani</em></td>
<td>- (0)</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td><em>Furcifer lateralis</em></td>
<td>- (0)</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td><em>Calumma hilleniusi</em></td>
<td>9 ± 7 (57)</td>
<td>57</td>
<td>132,3</td>
<td>Hazard</td>
<td>39,7*</td>
<td>45,2 – 387,2</td>
</tr>
<tr>
<td>Savannah</td>
<td><em>Furcifer campani</em></td>
<td>1 ± 0,3 (47)</td>
<td>47</td>
<td>14,2</td>
<td>Uniform</td>
<td>25,6</td>
<td>8,5 – 23,8</td>
</tr>
<tr>
<td></td>
<td><em>Furcifer lateralis</em></td>
<td>1 ± 0,4 (29)</td>
<td>59</td>
<td>5,7</td>
<td>Uniform</td>
<td>47,5</td>
<td>2,3 – 14,4</td>
</tr>
<tr>
<td></td>
<td><em>Calumma hilleniusi</em></td>
<td>0,06 ± 0,06 (2)</td>
<td>2</td>
<td>0,4</td>
<td>Uniform</td>
<td>99,8*</td>
<td>0,0 – 2,4</td>
</tr>
</tbody>
</table>

**Table 3:** Abundance index (number of individuals observed per 100 m) (± SE) and number of observations of individual (in parenthesis) of chameleon species encountered in the south-western Madagascar during March-April 2009.

<table>
<thead>
<tr>
<th>Study site</th>
<th><em>Furcifer antimena</em></th>
<th><em>Furcifer belalandaensis</em></th>
<th><em>Furcifer verrucosus</em></th>
<th><em>Furcifer lateralis</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sakabera</td>
<td>1.81 ± 0.39 (68)</td>
<td>0.10 ± 0.52 (5)</td>
<td>0.29 ± 0.17 (13)</td>
<td>0.42 ± 0.20 (18)</td>
</tr>
<tr>
<td>Belalanda</td>
<td>2.61 ± 1.35 (40)</td>
<td>0.12 ± 0.09 (2)</td>
<td>0.14 ± 0.14 (5)</td>
<td>1.65 ± 1.07 (37)</td>
</tr>
</tbody>
</table>
**Table 4:** Abundance index (± SE) of chameleon species within each habitat type in the Tsitongambarika forest in November-December 2009.

<table>
<thead>
<tr>
<th>Forest Disturbance</th>
<th><em>Brookesia nasus</em></th>
<th><em>Calumma nasutum</em></th>
<th><em>Calumma brevicorne</em></th>
<th><em>Furcifer balteatus</em></th>
<th><em>Furcifer verrucosus</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Less Disturbed</td>
<td>6.20 ± 1.77</td>
<td>0.16 ± 0.09</td>
<td>0.20 ± 0.1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>(148)</td>
<td>(4)</td>
<td>(5)</td>
<td>(0)</td>
<td>(0)</td>
</tr>
<tr>
<td>More Disturbed</td>
<td>3.30 ± 0.80</td>
<td>0.50 ± 0.17</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>(67)</td>
<td>(10)</td>
<td>(0)</td>
<td>(0)</td>
<td>(1)</td>
</tr>
</tbody>
</table>

**Table 5:** Abundance index (± SE) and calculated density by the program DISTANCE for *Furcifer angeli* in each habitat type in the Bongolava forest corridor during February-March 2010.

<table>
<thead>
<tr>
<th>Forest Disturbance</th>
<th>AI (Nb)</th>
<th>N</th>
<th>D (ha⁻¹)</th>
<th>Model Selected by DISTANCE</th>
<th>C.V. (%)</th>
<th>C. I. (95%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less Disturbed</td>
<td>2.6 ± 0.0 (28)</td>
<td>28</td>
<td>16.1</td>
<td>Half-normal</td>
<td>29.5</td>
<td>8.9 – 28.8</td>
</tr>
<tr>
<td>More Disturbed</td>
<td>0.5 ± 0.2 (27)</td>
<td>27</td>
<td>10.6</td>
<td>Uniform</td>
<td>24.6</td>
<td>6.4 – 17.6</td>
</tr>
</tbody>
</table>

**Table 6:** Factors affecting the presence and absence of three sympatric chameleon species in Sakabera and Belalanda during November-December 2009 effectuated with Mann Whitney Test.

<table>
<thead>
<tr>
<th>Species</th>
<th>Variables on habitat</th>
<th>Presence</th>
<th>Absence</th>
<th>U</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Furcifer belalandaensis</em></td>
<td>Canopy Cover (%)</td>
<td>49.16 ± 8.60</td>
<td>36.61 ± 1.75</td>
<td>447n.s.</td>
</tr>
<tr>
<td></td>
<td>Canopy height (m)</td>
<td>9.58 ± 0.82</td>
<td>6.73 ± 0.23</td>
<td>248*</td>
</tr>
<tr>
<td></td>
<td>Number of cut stick</td>
<td>5.16 ± 1.66</td>
<td>2.84 ± 0.16</td>
<td>426n.s.</td>
</tr>
<tr>
<td></td>
<td>Circumference at Breast Height (m)</td>
<td>2.57 ± 0.76</td>
<td>1.42 ± 0.04</td>
<td>342*</td>
</tr>
<tr>
<td><em>Furcifer antimena</em></td>
<td>Canopy Cover (%)</td>
<td>39.33 ± 2.76</td>
<td>36.01 ± 2.14</td>
<td>4416n.s.</td>
</tr>
<tr>
<td></td>
<td>Canopy height (m)</td>
<td>8.20 ± 0.67</td>
<td>6.30 ± 0.18</td>
<td>3994**</td>
</tr>
<tr>
<td></td>
<td>Number of cut stick</td>
<td>3.79 ± 0.34</td>
<td>2.57 ± 0.18</td>
<td>4199*</td>
</tr>
<tr>
<td></td>
<td>Circumference at Breast Height (m)</td>
<td>1.61 ± 0.11</td>
<td>1.39 ± 0.05</td>
<td>4751n.s.</td>
</tr>
<tr>
<td><em>Furcifer lateralis</em></td>
<td>Canopy Cover (%)</td>
<td>40.00 ± 6.30</td>
<td>36.75 ± 1.79</td>
<td>1220n.s.</td>
</tr>
<tr>
<td></td>
<td>Canopy height (m)</td>
<td>7.73 ± 0.59</td>
<td>6.75 ± 0.23</td>
<td>1067n.s.</td>
</tr>
<tr>
<td></td>
<td>Number of cut stick</td>
<td>3.61 ± 0.67</td>
<td>2.86 ± 0.16</td>
<td>1202n.s.</td>
</tr>
<tr>
<td></td>
<td>Circumference at Breast Height (m)</td>
<td>1.83 ± 0.17</td>
<td>1.43 ± 0.05</td>
<td>941*</td>
</tr>
</tbody>
</table>

n.s.: non significative  
*: <0.05  
**: <0.0005
Figure 3: Percentage of tree species with (dark) or without (grey) *Furcifer belalandaensis* at Belalanda and Sakabera villages.
**Objective 2:** To identify priority areas of conservation for *Furcifer* chameleons

Early on in the project we confirmed the existence of *F. belalandaensis* in two villages and brought this to the immediate attention of WWF who were managing the surrounding area and attempting to create a new protected area. The boundaries of the proposed new protected area and now being revised using the information we provided, but perhaps of more importance is that the species now has a much higher profile within WWF. This was helped by a series of meeting facilitated by project members and a presentation by the project leader at a WWF priority setting workshop on the Ala Maiky ecoregion. An extension of the PK32 Ranobe NAP was made by WWF to include the distribution area of this species (Figure 4).

Field visits was undertaken in the surrounding area of the NPA of PK32 Ranobe to confirm that this species has a restricted distribution range in Belalanda and Sakabera, and to do a monitoring survey with WWF staff and to raise their capacity regarding chameleon identification and surveys during November-December 2009 (Appendix 4).

Three field visits were completed at the Ankaratra massif: in November-December 2008, October 2009, and January 2010 to identify the priority sites for conservation and sustainable use of *F. campani* and *F. lateralis*.

We received funding from CI Madagascar support an association called VIF who are creating a new protected area in the Ankaratra massif. We participated in three meetings (16.11.09, 11.02.10. 15.04.10) where we presented our results on *Furcifer* chameleons.

![Figure 4: Map showing the extension of the NAP PK32 Ranobe to include *F. belalandaensis* populations (Source WWF Madagascar).](image-url)
The gap analysis of the current distribution of *Furcifer* species, mining blocks and protected areas in western Madagascar showed that certain parks are surrounded by prospective mineral exploitation (e.g. Figure 5 A, B and C).

**Figure 5:** Gap analysis of current distribution of *Furcifer* species, mining blocks and protected areas in the western Madagascar.
Objective 3: To raise the capacity of stakeholders to conserve chameleons

The most significant achievements in this respect were probably supporting the Malagasy CITES Scientific Authority for Animals. This was important because it occurred at a time when it was genuinely needed, provided training for herpetologists as well as the SA personnel and included capacity building on procedures that can be used for other animal species. Whilst we are supporting NGOs like WWF and CI to conserve chameleons at two key sites, we are very much still involved and most of the conservation is being undertaken by our project personnel. We think that in Madagascar there is a fairly high capacity for conserving habitats and the chameleons have so far been overlooked mainly because they have not featured on the IUCN Red List.

Objective 4: To raise the awareness about chameleons

We have made significant progress on this objective in a number of respects. Firstly, we displayed a prominent poster display in the 3-day festival in the national zoo in Antananarivo as part of Madagascar’s celebrations for International Year of Biodiversity (Appendix 5). During this event we invited visitors to our exhibition to look at a chameleon poster that we had produced and too choose their favourite species. This ‘game’ generated a great deal of discussion and interest by children and adults alike. We also managed to raise the awareness of forest managers about key chameleon species. This included working with WWF and CI to ensure that chameleons in PK32 Ranobe and Ankaratra feature prominently in conservation plans. We also facilitated the visit of a German research team to a priority site for Madagasikara Voakajy which resulted in the description of a new chameleon species to science. We then later supported the District Authority of Anosibe An’ala in selecting the Tarzan Chameleon as the flagship species for the district. At the local level we concentrated our efforts around Sakabera and Belalanda.

An education project in primary schools was carried out in December 2010, planned with the close support of the regional education authorities. Two primary schools were visited and 46 children, one teacher and the director participated in Belalanda, and 19 children and one teacher in Sakabera (Appendix 6). Messages about chameleons and their habitats were transmitted to the students through multiple choice questions based on a PowerPoint presentation. Each pupil also produced a color picture of chameleons and received the poster that the project produced, in addition to a set of color pencils. The color pictures were judged by teachers and the children and the winners received complete stationery sets (Appendix 7). We also managed to raise the awareness of chameleons amongst adults in the same villages and this resulted in the creation of two village associations (FIMAB; Fikambana miaro ny ala sy ny biby in Belalanda, and FITAMITO (Fikambanan'ny tantsaha miaro ny tontolo iainana in Sakabera) were created by the local communities with the contribution of WWF Tulear following recommendations from the team. A capacity building event on chameleon identification and their habitats was organized for each association (Appendix 8). All participants (13 coming from FIMAB in Belalanda and 8 fromFITAMITO in Sakabera) received each a poster on Furcifer chameleon of the south-western Madagascar. Posters were also distributed to the regional representatives of the Ministry of the environment and forests, WWF, and the local and regional authorities on the education and administrative.

We put significant effort into supporting four Malagasy students from two universities.

Objective 5: To assess the economic importance of chameleons
A research project was also conducted to assess the potential importance of chameleons, relative to other species, for ecotourists. This work has been accepted for publication in the Journal of Ecotourism and demonstrates that, after lemurs, chameleons are the next most important animal for tourists. They therefore seem to be an under-exploited resource in Madagascar with respect to non-consumptive use.

The project team worked closely with the CITES authorities in Madagascar. We were influential in assisting Madagascar to respond to a technical query from the CITES Secretariat and produced a report to support this work (Appendix 9). We also held a workshop on non-detriment findings, during 9th and 10th February, 2010 to support the science of sustainable collection of Appendix II species. Twenty six participants among the SA Fauna and MA CITES Madagascar, partners, national experts, and students were present at this workshop. The list of participants is shown in the Appendix 10.

Monitoring for sustainable collection was undertaken on *F. campani* in Ankaratra massif. Nineteen fixed transects were surveyed in October 2009, January, Mai, and August 2010 to collect data on ecology and biology for sustainable trade and conservation.

Section 3

Achievements and Impacts

IUCN Red List

The 19 *Furcifer* species accounts and maps that we sent to IUCN for review accompanied by 250+ other Madagascar reptiles. We had been concerned for some time that the reptiles of Madagascar were not included on the IUCN Red List of Threatened Species and this became a focal part of the early phases of our consolidation award. Madagasikara Voakajy developed a chameleon conservation project with the Durrell Institute for Conservation and Ecology (University of Kent) and received funding from the Darwin Initiative. This project was supported by the IUCN Species Survival Commission and Conservation International and aimed to assess the conservation status of all Malagasy chameleons for the IUCN Red List. The initial plan for 19 species had therefore been superseded by the new project which added 58 more chameleon species, and necessitated a revised timetable. Shortly before the chameleon project with DICE was to commence, IUCN invited Madagasikara Voakajy to prepare species accounts for an additional 200 reptile species (skinks, geckoes, snakes etc.) with the objective of assessing all the species together. Thus, the 19 *Furcifer* became 250+ reptile species. The Madagascar Global Reptile Assessments assessed 18 *Furcifer* chameleon species (one taxon was not considered because it is no longer considered valid). The event was covered by national media, and the project leader was broadcast on both national radio and television. Interestingly, the classification of *F. belalandaensis* as Critically Endangered had a real impact on the local communities in area where this species occurred because they heard about it on national radio. The other impact of this part of the project will not be completed until the Red List accounts are published on the internet.

Chameleon Specialist Group

Our work to assess the conservation status of Malagasy chameleons was coincidentally advanced at the same time as a similar initiative in mainland Africa. This led to a successful
proposal to the IUCN Species Survival Commission for the creation of a Chameleon Specialist Group (CSG). The team leader is on the steering committee of the CSG.

**Herpetological Association of Africa’s**
The team leader attended the Herpetological Association of Africa’s meeting in Cape Town in January 2011, gave a presentation on chameleon conservation in Madagascar, and becomes a member of this association.

**Conservation sites**

**New Protected Area PK32 Ranobe:** We identified that *F. belalandaensis*, a priority species for conservation occurred outside the Madagascar Protected Area System during a workshop organized by the *Groupe Priorisation SAPM* Madagascar in June 2008. Following our recommendations during this workshop and meetings organized with WWF Antananarivo and Tulear in September and December 2009, an extension map was established by WWF to include the area where *F. belalandaensis* occurs. A workshop was organized by WWF from March, 30th to April, 2nd in Antananarivo to develop a conservation plan and integration of adaptation to climate change in the Ala Maiky Programme (WWF’s south-western forest eco-region). Christian Randrianantoandro gave a presentation on the reptiles of the Ala Maiky and showed that the chameleon *F. belalandaensis* should be a priority species for the conservation because of the following reasons: (1) only 30 individuals of this chameleon species were recorded since 1995; 4 in the same year (Raxworthy, person. comm.), 9 in 2008 (Raxworthy, unpublished data), 1 in 2008 by MV (Andriantsimanarilafy, unpublished data), 7 in March 2009 by MV, 7 in November-December 2009 by MV, and 2 in March 2010 by MV; (2) This species has a very restricted distribution range; and (3) *F. belalandaensis* occurs only in two localities at Sakabera and Belalanda villages situated in the Buffer Zone of the NPA PK 32 Ranobe. Because of our efforts, this species now sits firmly in the minds of the managers of this area but considerable more work is needed to secure, or even improve, its conservation status.

**Ankaratra massif:** Three sites were identified as important for conservation. Important populations of *F. campani* occurred and monitored in the vast savannah of Tsimiaramianadahy, Tsiafajavona (second highest mountain in Madagascar) and Tambonana are important for a local endemic gecko *Lygodactylus mirabilis* and an endemic gecko *Phelsuma barbouri*. The Ankaratra massif is also characterized by a high richness on natural resources (water), therefore can provide important ecological services to the ecosystems. It is also an AZE site for the two critically endangered amphibians *Boophis williamsi* and *Mantidactylus pauliani* and a potential site AZE for *L. mirabilis*. We proposed three sites for collecting this species should the international trade resume (note that we are also advising the CITES authorities on how this can be achieved in line with Article IV of CITES) for trade were situated outside of the forest station and the proposed conservation site.

**Raised awareness amongst school children and local communities about chameleons**
Regional and local communities are involved in chameleon conservation in Belalanda and Sakabera. Two associations were created to protect the faunal biodiversity and especially the most endangered *F. belalandaensis* with support from WWF Tulear and recommendations from the team. No illegal collect (without collect permit) of *F. belalandaensis* was noted by the local community after November-December 2009 in Belalanda and Sakabera.
Raised capacity of students and park staff to conserve chameleons

Four Malagasy students were trained on the research methods and are preparing their master’s thesis on chameleons ecology and habitat preference. This represents a significant achievement which not only gives the students their first experience of field conservation but is also building the next generation of chameleon conservationists in Madagascar. The corollary of this is that as MV and students improve their capacity to conserve chameleons, major partners like CI and WWF, increasingly rely on such expertise. In reflection therefore, our major progress in capacity building has been to train young Malagasy students and improve MV’s profile as leaders in chameleon conservation.

Sustainable trade for chameleon species

The team worked in close collaboration with the Scientific Authority for Animals Fauna and the national experts, and the Management Authority CITES Madagascar regarding the trade on chameleon species. The CITES Secretariat wrote to the Management Authority in Madagascar on the 6th August 2009 to inform them about the decisions made during the 24th meeting of the Animals Committee and the 58th meeting of the Standing Committee. Species belonging to the chameleon genera *Furcifer* and *Calumma* were assessed by a consultant and each taxon was attributed to one of four categories. These categories defined which species were candidates for resumed trade (C3 & C4) and which were unlikely to meet the conditions of article IV and should not be traded (C1 & C2). Madagascar was sent the annotated species list and encouraged to comment on the taxa listed as C1 and C2. It was also informed of the three conditions set by the Standing Committee pertaining to the trade in C3 and C4 species. A meeting was then organised by the CITES Management and Scientific Authority (Fauna) in Madagascar during October 2009 to discuss the letter from the Secretariat. It was decided that the Scientific Authority (Fauna) and other experts would review the list of species sent by CITES and a Malagasy organisation (Madagasikara Voakajy) agreed to prepare a report by the end of January 2010. The Madagasikara Voakajy (MV) report was circulated to the Scientific Authority (Fauna) and other experts in Madagascar two weeks before a meeting on 1st February 2010. In this report, *F. campani*, and *F. antimena* were proposed in C3 and this is retained by the SA Fauna CITES Madagascar and the Malagasy experts, and *F. belalandaensis* is retained also to C1 (Appendix 11). We attended a meeting organized by the Management Authority and Scientific Authority on December, 13th to develop a new formula for quota calculation for chameleon species. A report on non-detriment findings on the annual quota of the two *Furcifer* species: *F. campani* and *F. minor* were provided by a committee composed by the representatives of Management Authority and Scientific Authority, Durrell Institute for Conservation and Ecology (DICE) and MV (Appendix 12).

Convention on Biological Diversity (CBD)

The team leader participated actively in meetings to establish the fourth national report on CBD Madagascar and has provided information concerning chameleon diversity and as well as a brief plan of priority activities (Appendix 13).
Conclusions
Through using education, advocacy, biological research, academic publishing, oral presentations at regional conferences and the provision of expert opinion (when asked) this project has raised the profile of chameleons in Madagascar. It has simultaneously used the results of field studies to promote the strict protection of rare and threatened species, whilst also providing scientific justification for the sustainable trade of more common species. It initiated a process, to Red List 18 chameleons, that very quickly became a process to Red List 366 reptile species. Once completed, the presence of Malagasy reptiles on the Red List will be a key resource for future land use and conservation planning. The project has identified a series of new chameleon conservation objectives that urgently need to be implemented. Similarly, the support for the Malagasy CITES authorities should continue because the future is likely to see more, rather than fewer, Malagasy reptile species in the trade.

Problems encountered and potential solutions
Despite my efforts to include as many people as possible in the review of the species accounts and many people agreed to contribute, I only received feedback from 6 people. It is clear that workshops are the most effective way to obtain the opinions of multiple experts.

The political crisis in Madagascar, which saw an unconstitutional change of government and donor desertion, affected the involvements of Malagasy herpetologists and experts in term of communication fewer meetings and workshops were organized.

In the future
A meeting between Chameleon Specialist Group should be organized to recruit new members, and to coordinate activities on chameleons.

Establish a species conservation strategy with all stakeholders on the most threatened chameleon species *F. belalandaensis* occurred only in the Belalanda and Sakabera, and other chameleon species *Calumma tarzan* in Ambatofotsy new protected area, and the dwarf chameleon *Brookesia bonsi* in the Namoroka National Park.

Conduct research on the biology, ecology, and life history of chameleon species (*F. balteatus*) classified in the category Data Deficient and, on the density or population size of *F. antimena* in different areas for the sustainable use and conservation.

Monitor the chameleon species with the community-based in conservation and collecting sites in 2011.

Establish local quota with the involvement of the community-based and authorities local and regional for chameleon species involved in the trade.
Section 4

Appendices

Appendix 1

FOR REVIEW:
Preliminary IUCN Red List species accounts prepared for chameleons (Genus Furcifer)

Prepared by:
J. Christian Randrianantoandro, Bertrand Razafimahatratra, Raphali Andriantsimanarilafy & Richard K. B. Jenkins

A component of the Conservation Leadership Programme, Follow-up Award, to J. Christian Randrianantoandro entitled A Conservation Framework for Furcifer Chameleons in Madagascar

Also funded by:

A Madagasikara Voakajy project in collaboration with its partners:
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Note to contributors

The IUCN Red List of Threatened Species is an authoritative assessment of the conservation status of the world’s biodiversity. It is an important tool for conservation planning and monitoring status change in threatened species. In recent years, significant improvements to the assessment process and two major initiatives (Global Mammal and Global Amphibian Assessments) have combined to make the IUCN Red List the single most important database on biodiversity. The challenge now is to continue this progress and conduct a Global Reptile Assessment.

Many of Madagascar’s chameleon species have highly restricted ranges and are dependent on intact forest vegetation for survival. A high proportion of chameleon species is therefore likely to be threatened with extinction, but there has yet to be formally assessed using the latest IUCN Red List criteria.

Madagasikara Voakajy has prepared species accounts for all 17 endemic *Furcifer* chameleons, which summarize the current state of knowledge on their taxonomy, ecology and distribution. These species accounts will be used as a basis for assessing their Red List status later in 2009.

We are now inviting anyone with particular knowledge or information about these chameleons to comment on the species accounts. We have endeavored where possible to use only published information in compiling these accounts to make them transparent, traceable and authoritative. We are particularly interested in any updates or revisions to the distribution maps because these will form a part of the eventual Red Listing process. If you are able to provide new information, please also provide the appropriate source, as either:

i. Reference to published, peer-reviewed literature (preferred)
ii. Reference to unpublished literature (please provide pdf)
iii. Reference number for a voucher specimen
iv. Personal communication that we can cite and make available on a website

We therefore invite you to:

- Acknowledge receipt of the files and indicate if you are able to read and comment on them
- Send any remarks, ideas, suggestions, comments to Christian Randrianantoandro

We would appreciate all comments to be returned to Christian Randrianantoandro before the 18th March, 2009.
Note à tous les collaborateurs

La Liste Rouge de l’UICN des espèces menacées est une évaluation autoritaire du statut de conservation de la biodiversité dans le monde. C’est un outil important pour la planification de la conservation et le monitoring des changements de statut des espèces menacées. Pendant des récentes années, les améliorations importantes du processus d'évaluation et deux grandes initiatives (Global Mammal and Global Amphibien Assessment) ont combinés pour faire la Liste Rouge de l’UICN la seule donnée de base importante sur la biodiversité. Maintenant, le défi est de continuer ce progrès et de diriger une Evaluation Globale des Reptiles (Global Reptile Assessment).

Beaucoup d’espèces de caméléon à Madagascar ont des aires de distribution très restreintes et sont dépendantes de la végétation intacte de la forêt pour leur survie. Une grande partie des espèces de caméléon est donc probablement menacée d’extinction, mais doit être pourtant formellement évaluée en utilisant les derniers critères de La Liste Rouge de l’UICN.


Nous invitons maintenant tous ceux qui ont de la connaissance ou information particulière sur ces caméléons pour faire des commentaires sur ces informations des espèces. Nous avons essayé autant que possible d’utiliser uniquement des données publiées en compilant ces informations pour les montrer transparents, claires et tranchants. Nous sommes notamment intéressés sur toutes mises à jour ou révisions sur les cartes de distribution parce qu’elles formeront une partie de la procédure de l’établissement de la Liste Rouge. Si vous pouvez fournir une nouvelle information, veuillez aussi procurer la source appropriée, comme :

i. Référence pour la littérature publiée et pair-réexaminée (de préférence)
ii. Référence pour la littérature non-publiée (veuillez fournir le pdf)
iii. Numéro de référence pour le spécimen
iv. Communication personnelle que nous pouvons citer et mettre disponible sur un site web.

Nous vous invitons donc à :
• Accuser réception des dossiers et indiquer si vous pouvez les lire et les commenter
• Envoyer n'importe quelles remarques, idées, suggestions, et commentaires à Christian Randrianantoandro

Nous apprécierions si tous les commentaires sont retournés à Christian Randrianantoandro avant le 18 mars 2009.
**Furcifer angeli**  
(Bryggo and Domergue, 1968)

Angel’s chameleon  
Sakorikita matsoko orona  

**English name**  
**Malagasy name**

**Taxonomic notes**
None

**Geographic range information**
*Furcifer angeli* is endemic to the island of Madagascar where it is restricted to areas of dry forest in the north-west (Glaw and Vences 2007). It is known from four localities between Anjiamangirana in the north and Parc National de Namoroka to the south (Raselimanana 2008).

**Population**
*Furcifer angeli* is reported to be less common within Parc National d’Ankarafantsika, near Mahajunga, than Parc National Baie de Baly, near Soalala (Ramanamanjato and Rabibisoa 2002).

**Habitat & ecology**
Raselimanana (2008) reported that *F. angeli* is a diurnal, arboreal species which has a close association with dry, deciduous forest. It does not occur in heavily modified habitats (Raselimanana and Rakotomalala 2003), but can tolerate a certain amount of habitat degradation (Ramanamanjato and Rabibisoa 2002).

**Main threats**
The destruction or degradation of deciduous forest within its range poses the main threat to *F. angeli* and the areas around Parc National d’Ankarafantsika and Soalala have undergone significant forest loss since 1990 (Harper et al. 2007). These forests are under pressure from expanding human populations and illegal logging, wildfire and slash and burn agriculture all contribute to a reduction in the quality and quantity of the remaining deciduous forest.

**Conservation measures**
This species is known from Parc National d’Ankarafantsika (Ramanamanjato and Rabibisoa 2002), Parc National Baie de Baly (Carpenter 2002) and Parc National de Namoroka (Raselimanana 2008). Its status within the Parc National d’Ankarafantsika needs to be confirmed because it was not observed there by Raselimanana (2008) but was recorded there by (Ramanamanjato and Rabibisoa 2002). Its distribution within this protected areas, and within other forests within its extent of occurrence may be fragmented and additional information is needed on its habitat requirements. Given the recent discovery of this species in a site to the north of Parc National d’Ankarafantsika (Raselimanana 2008), further chameleon on the Bongalava plateau are needed to determine its distribution in the remaining forest. It is
listed as a protected species under Category I, Class II, which permits authorized collection from the wild but imports from Madagascar are currently prohibited by CITES.

**IUCN Red Listing**
The Red List status of *F. angeli* has yet to be assessed

*Furcifer angeli*
**Furcifer antimena**
Grandidier, 1872

Tand rodrebe Atsimo Andrefana Malagasy name

**Taxonomic notes**
None

**Geographic range information**
*Furcifer antimena* is restricted to the south-west of Madagascar at elevations between 5 m and 80 m above sea-level (Raselimanana and Rakotomalala 2003; Raselimanana 2004). The most easterly known location is around Antsokay and the airstrip at Toliara (Brygoo 1971) and the most northerly at An Kotapiky, near Morombe (Raselimanana 2004). It appears therefore that the Onilahy and Mangoky Rivers are the boundaries to the geographic range of *F. antimena* (Brygoo 1971).

**Population**
A global population of less than 2,500 individuals has been estimated for this species (CBSG 2002). In a field assessment of three *Furcifer* chameleons near Toliara, *F. antimena* constituted 15% of the 146 individuals encountered during line transects at night and a density of 18.7 individuals per hectare was calculated (Andriamandimbiarisoa 2007). There is some reported evidence of local population declines in the last 15 years but the reasons for this are unclear (Andriamandimbiarisoa 2007). In a survey of the Mikea forest *F. antimena* was observed in half of the six sites surveyed (Raselimanana 2004).

**Habitat & ecology**
It is considered a forest species by Raselimanana and Rakotomalala (2003) and is known to occur in both relatively intact and degraded areas (Raselimanana 2004).

**Main threats**
The forests in its range are under high pressure from expanding rural and urban human populations and underwent some of the largest declines in forest cover between 1990 and 2000 in the whole of Madagascar (Harper et al. 2007). The main threat to *F. antimena* is therefore conversion of native forest vegetation into charcoal and clearing forest for agriculture (Seddon et al. 2000; CBSG 2002; Andriamandimbiarisoa 2007). Mining may become a threat in future (Cardiff and Andriamanalina 2007).

**Conservation measures**
This species is listed as a protected species under Category I, Class II, which permits authorized collection from the wild. Areas within its extent of occurrence are currently been designated as new protected areas.

**IUCN Red Listing**
This species has not previously been assessed on the IUCN Red List. It was considered Least Concern by the IUCN/SSC Conservation Breeding Specialist Group (CBSG 2002).

*Furcifer antimena*
**Furcifer balteatus**  
(Duméril & Bibron, 1851)

Sakorkita mitsipibatana  
Malagasy  
Two-banded chameleon  
English

**Taxonomic notes**  
None

**Geographic range information**  
This species is endemic to Madagascar and its distribution is restricted to the central south-east at around 1,050 m above sea level in forests around Fort Carnot, Ifanadiana, Tologoina and Ikongo (Brygoo 1971; Raselimanana and Rakotomalala 2003; Glaw and Vences 2007). Reports of its occurrence further south need to be verified.

**Population**  
There is very little available information on the population of *F. balteatus* although it is not thought to exceed 10,000 individuals (CBSG 2002).

**Habitat & ecology**  
*Furcifer balteatus* is found in mid-altitude humid forest, where it is associated with degraded areas and forest edges (Glaw and Vences 2007).

**Main threats**  
The threats to this species are poorly understood but it appears to be associated with humid forest and the loss of this vegetation probably poses the main threat (CBSG 2002).

**Conservation measures**  
This species has been found inside Parc National de Ranomafana (Raselimanana and Rakotomalala 2003) and also reported from Parc National d’Andohahela (CBSG 2002). Its occurrence in the latter site needs to be verified because it was not detected during two herpetological surveys (Andreone and Randriamahazo 1997; Nussbaum et al. 1999), although it is conceivable that it is founds in areas of this large protected area that were not comprehensively surveyed. This species was not detected in surveys in Parc National de Midongy (Bora et al. 2007) and Reserve Spéciale de Kalambatritra (Andreone and Randrianirina 2007), which lie between Parc National de Ranomafana and Parc National d’Andohahela. This species is listed as a protected species under Category I, Class II, which permits authorized collection from the wild.

**IUCN Red Listing**  
This species has not previously been assessed on the IUCN Red List. It was considered Vulnerable (B1 ab (iii) + B2 by the IUCN/SSC Conservation Breeding Specialist Group (CBSG 2002).
Furcifer balteatus
**Furcifer belalandaensis**  
(Brygoo & Domergue, 1970)

Belalanda chameleon English name  
Tarondroben'i Belalanda Malagasy name

**Taxonomic notes**  
None

**Geographic range information**  
This species is endemic to Madagascar where it is known from a single locality, Belalanda, near Toliara in the south west (Brygoo 1978; CBSG 2002; Glaw and Vences 2007). The last published sighting of this species was in 1995 (Raxworthy and Nussbaum 2000).

**Population**  
There are no published data on the population of *F. belalandaensis* but it is not thought to exceed 250 individuals (CBSG 2002). Given that recent surveys have failed to detect this species (Andriamandimbiraisoa 2007), its presumed tiny geographic range and dwindling available habitat (Raxworthy and Nussbaum 2000), it is unlikely to be common anywhere in its range.

**Habitat & ecology**  
The habitat around Belalanda village is degraded gallery forest (Brygoo 1978; Raxworthy and Nussbaum 2000; Glaw and Vences 2007). This species was not found during extensive surveys in other forest habitats in the region and is therefore likely to be restricted to gallery forest along a single river (Raxworthy and Nussbaum 2000).

**Main threats**  
Degradation and destruction of gallery forest habitat in the Belalanda area constitute a risk to *F. belalandaensis*. The species has been subject to commercial collection (Raxworthy and Nussbaum 2000).

**Conservation measures**  
Survey work is needed urgently to obtain accurate information on the distribution and abundance of this species. In addition, if an extant population is discovered, habitat conservation initiatives would be required as a priority because Belalanda is outside of the recently proposed protected area in southern Mikea. This species is listed as a protected species under Category I, Class II, which permits authorized collection from the wild, but exports from Madagascar are currently prohibited (Carpenter et al. 2005).

**IUCN Red Listing**  
This species has not previously been assessed on the IUCN Red List. It was considered Critically Endangered (B2 ab (i,ii,iii)) by the IUCN/SSC Conservation Breeding Specialist Group (CBSG 2002).
*Furcifer belalandaensis*
**Furcifer bifidus**  
(Brongniart, 1800)

Sakorkita misy tandroka roa mirandalana  Malagasy name

**Taxonomic notes**
None

**Geographic range information**
This species is endemic to Madagascar and is found in the east of the island in regions north of the Mangoro River as far north as Parc National de Marojejy (Glaw and Vences 2007). Its maximum elevation is recorded as 450 m (Raselimanana and Rakotomalala 2003).

**Population**
There is no information on the population biology or status of this species although it may be rare because even though it has been recorded from Reserve Spéciale d’Analamazaotra (Raselimanana and Rakotomalala 2003) it was not found during a detailed survey of this site and surrounding areas (Rakotondravony 2004). In the Loky-Manambato complex near Daraina, *F. bifidus* was found in only one of the 12 forests surveyed, at Binara, in transitional forest (Rakotondravony 2006).

**Habitat & ecology**
This species is known from humid forests but detailed information about its habitat and ecology is lacking. If this species has a similar preference to other eastern *Furcifer* species for open habitats, which are associated with forest canopies edges, it may have been under-sampled in previous surveys and inventories.

**Main threats**
There is no evidence that this species is threatened from collection from the wild but habitat loss from expanding agriculture and commercial logging occurs within its range (CBSG 2002).

**Conservation measures**
More information is required on the habitat preferences and ecology of this species to better understand the patterns of occurrence within its known range and to determine the extent to which the fragmentation and degradation of native humid forests is a threat. This species has been found in Parc National de Zahamena, Reserve Spéciale d’Analamazaotra, Parc National de Marojejy and Reserve Spéciale d’Ambatovoky (Raselimanana and Rakotomalala 2003). Its presence in Parc National de Masoala need to be confirmed (CBSG 2002; Raselimanana and Rakotomalala 2003). This species is listed as a protected species under Category I, Class II, which permits authorized collection from the wild.

**IUCN Red Listing**
This species has not previously been assessed on the IUCN Red List. It was considered Data Deficient by the IUCN/SSC Conservation Breeding Specialist Group (CBSG 2002).

*Furcifer bifidus*
**Furcifer campani**  
(Grandidier, 1872)

Tandrondrokely Afovoantany  Malagasy name

**Taxonomic notes**
None

**Geographic range information**
This species is endemic to Madagascar and inhabits the central highlands from Parc National d’Andringitra in the south to Ankaratra in the north (Brygoo 1971; Vences, Andreone et al. 2002; Glaw and Vences 2007). Brygoo (1971) reported this species from Ibitry, Ambohimitombo, Antobe and Ambatolampy but specimen evidence from these localities is lacking (Vences et al. 2002). It is found between 1,850 m and 2,500 m above sea-level (Raxworthy and Nussbaum 1996) and has a fragmented distribution in isolated massifs which suggests that its area of occupancy is quite small.

**Population**
There is a lack of quantitative information on its populations (Raxworthy and Nussbaum 1996; Vences et al. 2002) but it might be locally abundant in suitable habitat (Brady and Griffiths 1999) and total population size may exceed 10,000 individuals (CBSG 2002).

**Habitat & ecology**
It uses secondary heathland and savanna grasslands in montane areas (Raxworthy and Nussbaum 1996; Vences et al. 2002; Andreone, Vences et al. 2007).

**Main threats**
*Furcifer campani* used to be collected in large quantities and 10,324 were exported from Madagascar between 1977 and 1995 (Carpenter et al. 2004). Human activities result in annual burning and degradation of the habitat where *F. campani* occurs but this is not thought to pose a major threat to the species (Vences et al. 2002).

**Conservation measures**
This species is listed on CITES Appendix II and Category I Class II of national wildlife legislation, but a trade suspension has been in place since 1994 (Carpenter et al. 2004, 2005). It occurs within the boundary of Parc National d'Andringitra but its habitat in the Ankaratra massif is not protected. Vences et al. (2002) report a sparse voucher collection and some of the reported localities therefore need to be resurveyed as a matter of priority to determine the number and distribution of isolated populations.

**IUCN Red Listing**
This species has not previously been assessed on the IUCN Red List. It was considered Least Concern by the IUCN/SSC Conservation Breeding Specialist Group (CBSG 2002).
Furcifer campani
**Furcifer labordi**  
(Grandidier, 1872)

Laborde’s chameleon  
Tandrondro  

**English name**  
**Malagasy name**

**Taxonomic notes**  
None

**Geographic range information**  
This species is restricted to the west and south west of Madagascar and is found in low elevation sites, between 20 m and 100 m above sea-level, with remaining forest cover (Raselimanana and Rakotomalala 2003; Andriamandimbiarisoa 2007; Glaw and Vences 2007; Raselimanana 2008). It has been recorded from the Mikea forest in south-western Madagascar (Raselimanana 2004; Karsten et al. 2008), the Menabe forests in western Madagascar (Brygoo 1971; Raselimanana and Rakotomalala 2003), Parc National de Kirindy Mite (Raselimanana 2008) and two sites further north, Katsepy and Soalala (Brygoo 1978).

**Population**  
In a field assessment of three Furcifer chameleons near Toliara, *F. labordi* constituted 16% of the 146 individuals encountered during line transects at night and a density of 29.7 individuals per hectare was calculated (Andriamandimbiarisoa 2007).

**Habitat & ecology**  
*Furcifer labordi* is a chameleon species that is strongly associated with dry forest, especially spiny forest in the south-west and deciduous forest in the west (Raselimanana and Rakotomalala 2003). This species exhibits a bizarre life history that consists of an annual cycle where synchronous hatching occurs in November, followed by rapid growth into maturity, copulation in January and senescence and death by April (Karsten et al. 2008). Eggs are deposited in nests in the ground and remain in diapause until shortly before the rains (Karsten et al. 2008). There is little quantitative data on clutch size for this species in the wild, but a radio tracked female was observed laying 11 eggs in southern Madagascar (Karsten, Andriamandimbiarisoa et al. 2008). This species is sexually dimorphic and exhibits physically intense combat and agnostic courtship (Karsten, Andriamandimbiarisoa et al. 2008). It is predated on by *Madagascarophis* and *Mimophis* snakes (Andriamandimbiarisoa 2007).

**Main threats**  
*Furcifer labordi* used to be collected from the wild and 485 were exported from Madagascar between 1977 and 1995 (Carpenter et al. 2004, 2005). There is no evidence that collection currently poses a threat to *F. labordi*. The forests in south-west are under high pressure from expanding rural and urban populations and underwent some of the largest declines in forest cover between 1990 and 2000 in the whole of Madagascar (Harper et al. 2007). The main threat to *F. labordi* in this region is therefore the conversion of native forest vegetation into charcoal and clearing forest for agriculture (Seddon et al. 2000; Andriamandimbiarisoa 2007).
Similarly, the forests in western Madagascar are threatened by charcoal production, slash and burn clearance for subsistence agriculture and timber harvesting (Smith et al. 1997; Ganzhorn et al. 2001; Young et al. 2008).

**Conservation measures**

It occurs within the boundary of the Reserve Spéciale d’Andranomena (Raselimanana and Rakotomalala 2003) as well as three other recently created or proposed protected areas (Central Menabe, Mikea, southern Mikea). It is listed on CITES Appendix II, but exports of wild caught individuals of this species were suspended in 1995 (Carpenter et al. 2004, 2005). It is listed as a protected species (Category I, Class II) under Malagasy law which permits authorized collection from wild. Additional survey work and research is needed on *F. labordi* to better understand its current distribution, ecological requirements and life history. In particular, it is important to survey for this species in the forests north of the Tsiribihina River because, although surveys have not found *F. labordi* in Parc National Tsingy de Bemaraha (Randrianantoandro et al. 2008) or Parc National de Namoroka (Raselimanana 2008), it might occur in the lower altitude forest to the west of these sites. It is also important to ascertain whether the unusual life history of *F. labordi* in the arid south is shared by other populations in the north where environmental conditions are less harsh.

**IUCN Red Listing**

This species is listed as Vulnerable on the IUCN Red List (IUCN 2008) but was considered to be Near Threatened by the IUCN/SSC Conservation Breeding Specialist Group (CBSG 2002).
**Furcifer lateralis**  
(Gray, 1831)

<table>
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<th>Malagasy name</th>
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<td>Jeweled chameleon</td>
<td>Tanalahy</td>
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<td>Carpet chameleon</td>
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**Taxonomic notes**
The validity of the larger major form from the arid south is unclear and has yet to be formally recognized (Glaw and Vences, 2007), but there is some evidence that it might warrant subspecies status (Boumans et al. 2007).

**Geographic range information**
This is an endemic species to Madagascar and is widely distributed throughout the island, with the exception of the north, between 120 m and 1,450 m above sea level (Raselimanana and Rakotomalala 2003; Glaw and Vences 2007). There is some evidence for genetic differentiation along a north-south axis but additional research is needed to clarify this (Boumans et al. 2007).

**Population**
Although this is a widespread species there are few data available on its population size.

**Habitat & ecology**
This is considered to be a forest edge species that is associated with herbaceous vegetation and shrubby savanna (Raselimanana and Rakotomalala 2003) but has also been recorded inside forest (Goodman et al. 1998). It is also found in arid spiny forest, rocky areas and in the canopy of trees, and is present in well vegetated gardens within its range (Glaw and Vences 2007). Clutch size in the wild is reported as eight to ten eggs (Raselimanana and Rakotomalala 2003) and four to 23 eggs (Glaw and Vences 2007). It is thought to survive a single year only in the wild (Glaw & Vences, 2007).

**Main threats**
As a species that uses the widespread savanna vegetation the Malagasy highlands, as well as a variety of other land use types, it is not thought to be any threatened from changes to its habitat as a result of natural or anthropogenic influences. Collection from the wild occurs for export overseas and 1,445 animals were shipped from Madagascar in 2006 and 9,300 between 2000 and 2005, but harvests based on current annual quota (2,000 animals) do not constitute a threat to this species.

**Conservation measures**
This species is listed on CITES Appendix II. It occurs on the edges of many protected areas (Raselimanana and Rakotomalala 2003) but has only been found inside the Parc National de Tsimanampetsotsa (Goodman et al. 2002),
IUCN Red Listing
This species has never been assessed for the IUCN Red List.

*Furcifer lateralis*
**Furcifer minor**
(Günther, 1879)

Minor’s chameleon  English name  
Lesser chameleon  English name  
Sakorkita afovoantany  Malagasy name

**Taxonomic notes**
None

**Geographic range information**
This species is endemic to Madagascar and appears to be restricted to the southern highlands although there is a single, questionable, record from Bélo-sur-mer on the west coast (Brygoo 1971; Glaw and Vences 2007). Aside from the record on the west coast *F. minor* is restricted to an elevational range of between 1,060 m and 1,360 m above sea level (Raselimanana 1998).

**Population**
There is no information on the population of *F. minor*.

**Habitat & ecology**
There is very little published information available on this species (Brady and Griffiths 1999). It has been reported as a forest species (IUCN/SSC, BIODEV et al. 1993) but has also been observed in coffee plantations in Itremo (Ramanantsoa 1974). A dissected female contained 12 eggs and oviposition occurs in April (Glaw and Vences 2007).

**Main threats**
Prior to CITES legislation in 1995 a total of 1,902 *F. minor* had been exported from Madagascar (Carpenter et al. 2004, 2005). Although there are no more legal shipments of this species there is convincing anecdotal evidence that collection from the wild still occurs around Itremo, although the destination of the chameleons is unknown (J. C. Randrianantoandro personal communication). The impact of this collection has yet to be studied but is unlikely to be a major threat to populations if highly localized and only involves relatively small quantities of chameleons.

**Conservation measures**
This species has been recorded from inside the Réserve Spéciale d’Ambohijanahary (Raselimanana 1998).

**IUCN Red Listing**
It is currently listed Vulnerable A1cd because on the IUCN Red List (IUCN 2008).
**Furcifer nicosiai**
Jesu, Mattioli and Schimmenti 1999

Tandrondro Malagasy name

**Taxonomic notes**
The *Furcifer verrucosus, F. nicosiai, F. oustaleti* group is in need of major revision and probably contains as yet undescribed species (Glaw and Vences 2007).

**Geographic range information**
This species is restricted to a relatively small area of western Madagascar and is only known from the Parc National Tsingy de Bemaraha (Raselimanana 2008). Records of *F. nicosiai* from the Menabe Region appear to represent a new species (Raselimanana 2008).

**Population**
In a survey of the dry deciduous forest of Parc National Tsingy de Bemaraha 22 *F. nicosiai* out of a total of 758 chameleons were found (Randrianantoandro et al. 2008).

**Habitat & ecology**
This species appears to be associated with relatively intact, dry deciduous forest (Jesu et al. 1999; Raselimanana and Rakotomalala 2003; Randrianantoandro et al. 2008).

**Main threats**
The loss, degradation and fragmentation of dry deciduous forest in the Parc National de Tsingy de Bemaraha, especially at the periphery, from expanding agriculture, fire and logging threatens *F. nicosiai*.

**Conservation measures**
This is species is found inside the Parc National de Tsingy de Bemaraha but additional information is needed to determine its distribution within the park.

**IUCN Red Listing**
This species has never been assessed using Red List criteria.
*Furcifer nicosiai*
**Furcifer oustaleti**
(Mocquard, 1894)

**Outalet’s chameleon** English name
Sakorikita bevata Malagasy name

**Taxonomic notes**
The *Furcifer verrucosus, F. nicosiai, F. oustaleti* group is in need of major revision and probably contains as yet undescribed species (Glaw and Vences 2007).

**Geographic range information**
*Furcifer oustaleti* is endemic to Madagascar where it occurs throughout most the island across an elevational range from 0 m to 1,300 m altitude (law and Vences 2007).

**Population**
*Furcifer oustaleti* was relatively abundant during in a survey of Montagne des Français in northern Madagascar (D'Cruze et al. 2007) but there are few published studies on its population abundance or distribution from elsewhere.

**Habitat & ecology**
*Furcifer oustaleti* is a large chameleon that is usually associated with open and degraded forest formations. It is found in montane savanna, deciduous dry forest and humid forest but is usually associated with the edge of intact forest formations and is rarely found in the interior of forests (Lethinen et al. 2003; Glaw and Vences 2007). In the Loky-Manambato complex near Daraina, *F. oustaleti* was found in all three of the six dry forests that were surveyed (Rakotondravony 2006). Populations are also known from urban settings and rural landscapes that have been heavily modified by people for agriculture (Glaw & Vences, 2007). This species has been observed feeding on small adult birds (Garcia and Vences 2002).

**Main threats**
This species is believed to be collected mainly from the countryside around Antananarivo by people who supply the animals directly to exporters (Carpenter et al. 2005). Collection was undertaken by professionals based on requests from exporters but ad hoc collection by members of the public was also reported (Carpenter et al. 2005). In 2006 1,398 *F. oustaleti* were exported from Madagascar and a total of 7,749 were exported between 2000 and 2006. Based on current knowledge of ecology and taxonomy, this species is not threatened by collection or habitat degradation.

**Conservation measures**
This species is listed on CITES Appendix II and there is an annual export quota of 2,000 wild caught animals. *Furcifer oustaleti* is found in Parc National d’Andohahela, Parc National de Tsimanampetsotsa, Parc National de Zombitse-Vohibasia and Parc National Tsingy de Bemaraha (Raselimanana and Rakotomalala 2003).
IUCN Red Listing
This species has never been assessed using IUCN Red List criteria.

*Furcifer oustaleti*
**Furcifer pardalis**  
(Cuvier, 1829)

Panther chameleon  English name  
Sakorikita avaratra  Malagasy name  

**Taxonomic notes**

None

**Geographic range information**

This species is endemic to Madagascar where it is widespread in lowland areas of the north-east and east. Raselimanana and Rakotomala (2003) give the elevation range of *F. pardalis* from 80 m to 950 m above sea level, although it certainly occurs at lower elevations (Rabearivony et al. 2008) and may be less common above 700 m (Raxworthy 1988; Raselimanana et al. 2000; Andreone et al. 2005).

**Population**

It is believed to be locally abundant in north-eastern and eastern lowland areas and a minimum population estimate of 451,730 individuals (95% confidence interval: 21,664-941,860) was calculated for the island of Nosy Be in north eastern Madagascar (Andreone et al. 2005). It was relatively abundant a survey of Montagne des Français (D'Cruze et al. 2007). The density of *F. pardalis* was estimated as 2.0 per ha in a regenerating agricultural land adjacent to lowland forest in the east (Rabearivony et al. 2008).

**Habitat & ecology**

This species is abundant in lowland degraded scrub and forest habitats where it uses trees of up to 10 m in height (Raxworthy 1988). Although it may also use the canopy in relatively intact forest (Raxworthy 1988), this is thought to be a relatively rare occurrence (Andreone et al. 2005). D'Cruze et al. (2007) found *F. pardalis* in sites associated with forest or in areas that have been highly disturbed by people. On the island of Nosy Be the highest abundance of *F. pardalis* was found along well-vegetation roadsides (Andreone et al. 2005) and ylang-ylang and coffee plantations (Andreone et al. 2003). Surveys in closed forest at sites in eastern and northern Madagascar revealed a notably low abundance of *F. pardalis* compared to roadsides in Nosy Be (Andreone et al. 2005). In the Loky-Manambato complex near Daraina, *F. pardalis* was found in all 12 survey sites, including dry forest, littoral forest and transitional forest. In a lowland forest in eastern Madagascar *F. pardalis* was not encountered inside the main vegetation block but was found breeding in areas of abandoned agriculture adjacent to the forest (Rabearivony et al. 2008). *Furcifer pardalis* might be associated with open areas in forests that are found alongside rivers (Andreone et al. 2005). A preference for open areas might be related to the opportunities for basking or visual communication using color (Andreone et al. 2005). Sexual maturity of *F. pardalis* is reached within one year and females are thought to follow an annual life history with males growing larger and living for longer (Andreone et al. 2005). Clutch size in the wild is reported as at least 23 eggs (Raselimanana and Rakotomalala 2003). This species has rapid growth, a relatively short life
span and high fecundity and could probably withstand increased levels of exploitation as long as degraded forest cover does not diminish (Andreone et al. 2005).

Main threats
This is the most sought after Malagasy chameleon species in international trade (Andreone et al. 2005). Current export quota are considered conservative and based on political expediency rather than sound scientific knowledge (Andreone et al. 2005). Collection for the pet trade is not thought to represent a significant threat (Andreone et al. 2005). A significant reduction of degraded or regenerating forest habitats through conversion into monocultures has been mentioned as a potential threat but this is not a concern at the moment (Andreone et al. 2005). Collection from wild occurs for export overseas and 1,684 animals were shipped from Madagascar in 2006 and 12,141 between 2000 and 2005, but harvests based on current annual quota (2,000 animals) do not constitute a threat to this species.

Conservation measures
*Furcifer pardalis* has been recorded from a number of protected areas; Réserve Naturelle Intégrale de Lokobe (Andreone et al. 2005), Réserve Spéciale de Manongarivo Réserve Spéciale d’Ambatovaky, Parc National de Marojejy, Réserve Spéciale de Nosy Mangabe, Parc National de Zahamena (Raselimanana and Rakotomalala 2003) and Parc National de Sahamalaza (Raselimanana 2008).

IUCN Red Listing
This species has never been assessed using IUCN Red List criteria.
Furcifer pardalis
**Furcifer petteri**
(Brygoo & Domergue, 1966)

Petter’s chameleon English name
Sakorikitia ny Avaratra andrefana Malagasy name

**Taxonomic notes**
Individuals from Parc National Tsingy de Bemaraha may represent a new species (Randrianantoandro et al. 2008)

**Geographic range information**
*Furcifer petteri* is endemic to the island of Madagascar where it is restricted to the north-west, between Parc National Tsingy de Bemaraha and Montagne des Français (Glaw and Vences 2007). It is thought to occur between elevations of 120 m and 850 m above sea level (Raselimanana and Rakotomalala 2003). The form in Parc National Tsingy de Bemaraha may represent a new species and the geographic range of this taxon should be updated in accordance with future taxonomic revisions.

**Population**
Although there are no quantitative data available on the population of *F. petteri* it was considered to be a rare species in a survey of Montagne des Français (D’Cruze et al. 2007). Also, in a chameleon survey of Parc National Tsingy de Bemaraha, *Furcifer cf. petteri* was only encountered on two occasions, representing 3% of all the chameleons observed during the study (Randrianantoandro et al. 2008). However, Glaw and Vences (2007) note that *F. petteri* can be locally abundant.

**Habitat & ecology**
This species has been recorded from relatively intact humid forest, degraded forest and well vegetated gardens (Glaw and Vences 2007). It was encountered in trees and on the ground in Montagne des Français where it was associated with forest habitats (D’Cruze et al. 2007). Raselimanana and Rakotomalala (2003) considered its main habitat to be humid forest. In the Loky-Manambato complex near Daraina, *F. petteri* was found in nine of the 12 forests surveyed, in degraded and relatively intact dry forest vegetation (Rakotondravony 2006).

**Main threats**
Fire and logging are the main threats to *F. petteri* (CBSG 2002).

**Conservation measures**
This species has been found inside Parc National de Montagne d’Ambre, Reserve Spéciale d’Ankarana (Raselimanana and Rakotomalala 2003) and Reserve Spéciale de Ankarana (Raselimanana 2008).

**IUCN Red Listing**
This species has not previously been assessed on the IUCN Red List. It was Vulnerable B2ab (iii) by the IUCN/SSC Conservation Breeding Specialist Group (CBSG 2002).

*Furcifer petteri*
*Furcifer rhinoceratus*
(Gray, 1843)

**Geographic range information**
*Furcifer rhinoceratus* is endemic to Madagascar and is restricted to an area in the north-west centered between Parc National d’Ankarafantsika, at 80 m above sea level (Raselimanana & Rakotomalala, 2003; Glaw & Vences, 2007), and Andranomanantsy Forest (Raselimanana 2008).

**Population**
There is no information on the population of this species.

**Habitat & ecology**
*Furcifer rhinoceratus* was found in dry deciduous forest associated with small valleys in Parc National d’Ankarafantsika (Ramanamanjato & Rabibisoa, 2002). It is diurnal and arboreal (Raselimanana 2008).

**Main threats**
The main threats to this species are not well documented but because it is dependent on relatively intact forest (Raselimanana 2008), any activities that reduce the extent or quality of this habitat will impact *F. rhinoceratus*. Within its extent of occurrence there has been significant forest loss in the last two decades (Harper et al. 2007).

**Conservation measures**
This species occurs in Parc National d’Ankarafantsika (Ramanamanjato & Rabibisoa, 2002).

**IUCN Red Listing**
This species has not been assessed for the IUCN Red List.
*Furcifer rhinoceratus*
*Furcifer tuzetae*
(Brygoo, Bourgat & Domergue, 1972)

**Taxonomic notes**
None

**Geographic range information**
*Furcifer tuzetae* is endemic to the island of Madagascar where it was thought to be restricted to small areas of dry forest in the south-west (Glaw and Vences 2007). More recently, this species has been discovered in two localities in the north-west of the island (Raselimanana 2008). Areas between the north-western and south-western localities have been visited and it is not clear whether this species is present across a wide area, but it exceptionally rare, or if it is genuinely restricted to these two isolated areas.

**Population**
There are no data on the population of this species.

**Habitat & ecology**
There are no published accounts of its habitat and ecology although it is thought to be restricted to forest habitats (Raselimanana 2008).

**Main threats**
The destruction or degradation of deciduous forest poses the main threat to *F. tuzetae*.

**Conservation measures**
This species is known from Parc National de Sahamalaza (Raselimanana 2008). Its status within south-western Madagascar needs to be assessed urgently.

**IUCN Red Listing**
The Red List status of *F. tuzetae* has yet to be assessed
Furcifer tuzetae
**Furcifer verrucosus**
(Cuvier, 1829)

Sakorikitabe Malagasy name

**Taxonomic notes**
The *Furcifer verrucosus, F. nicosiai, F. ousaleti* group is in need of major revision and probably contains as yet undescribed species (Glaw & Vences, 2007)

**Geographic range**
*Furcifer verrucosus* is endemic to Madagascar where it occurs in the west and south of the island in habitats lower than 120 m above sea level (Raselimanana & Rakotomalala, 2003; Glaw & Vences, 2007).

**Population**
In a field assessment of three *Furcifer* chameleons near Toliara, *F. verrucosus* was the most common species and constituted 69% of the 146 individuals encountered during line transects at night and a density of 67.7 individuals per hectare was calculated (Andriamandimbiarisoa, 2007)

**Habitat & ecology**
This species is abundant in degraded habitats and is not dependent on the presence of large tracts of relatively intact forest (Andriamandimbiarisoa, 2007). Although it is frequently recorded in zoological surveys (Ramanamanjato et al. 2002; Raselimanana, 2004; Raselimanana et al. 2005) information on the habitat and ecology of this widespread species is surprisingly scarce. Adult and sub-adult *F. verrucosus* survives the harsh austral winter by aestivating in the soil and is a perennial species (Karsten et al. 2008).

**Main threats**
In 2006, 1,305 *F. verrucosus* were exported from Madagascar and a total of 6,044 were exported between 2000 and 2006 (CITES Secretariat, Madagascar). Because this species is widely distributed in south-western Madagascar and can survive in degraded habitats the loss of native forest vegetation probably does not pose a major threat.

**Conservation measures**
This species is listed on CITES Appendix II and there is an annual export quota of 2,000 wild caught animals. It has been recorded inside Parc National d’Andohahela, Parc National Zombitse-Vohibasia (Raselimanana & Rakotomalala, 2003) and Parc National de Tsimanampetsotsa (Goodman et al., 2002). Taxonomic studies on morphology and genetics needed to be quickly advanced because there may be undescribed species within the taxon currently referred to as *F. verrucosus*, and these will have smaller geographical ranges and could be more dependent on native vegetation.

**IUCN Red Listing**
This species has never been assessed using IUCN Red List criteria.

*Furcifer verrucosus*
**Furcifer willsii**
(Günther, 1890)

Sakorikita misy tandroka roa    Malagasy name

**Taxonomic notes**
None

**Geographic range information**
This species is endemic to Madagascar where it occurs in the north and central north-east of the island between 600 m and 1,300 m above sea level (Brady and Griffiths 1999; Glaw and Vences 2007).

**Population**
In a rapid assessment survey at five sites in the Mantadia-Zahamena Corridor *F. willsii* was only located at one site (Iofa) and was considered a rare species overall (Rabibisoa et al. 2005). It was also considered to be present at a low abundance in an area of the Anjozorobe-Angavo forest corridor, where it was found in only one of the seven forest areas surveyed (Raselimanana and Andriamampionona 2007). In a survey of five forest areas in eastern Madagascar *F. willsii* was only found in Perinèt [Analamazaotra] (Raxworthy 1988). Although it was once reported as abundant at Andasibe (Brygoo 1971) more recent surveys only found a few individuals despite considerable search effort (Brady and Griffiths 1999). It therefore appears that *F. willsii* is an uncommon member of the chameleon species assemblage throughout its range.

**Habitat & ecology**
Very little is known about the habitat and ecology this species and the available information is based on a small number of observations. There is a single record from dry deciduous forest in western Madagascar (Parc National d’Ankarafantsika) but this needs to be verified (Glaw and Vences 2007). Although *F. willsii* has been found in open areas it is considered a species mostly restricted to mid-altitude humid forest (Andreone et al. 2007). It may roost higher in vegetation than other species (Parcher 1974; Glaw and Vences 2007), but evidence for this is equivocal (Brady and Griffiths 1999). In and around Réserve Spéciale d’Analamazaotra and Parc National de Ranomafana *F. willsii* was found in degraded habitats at the forest edge (Brady and Griffiths 1999). There is also a single observation from within relatively intact forest (Raxworthy 1988). The abundance of this species may therefore be underestimated if it is more common in highly degraded forests or in tree canopies because these are rarely systematically surveyed using standard chameleon or herpetological fieldwork techniques.

**Main threats**
*Furcifer willsii* was one of the most commonly exported species between 1989 and 1993 until CITES parties suspended all imports from Madagascar (Brady and Griffiths 1999). Brady and Griffiths (1999) reported that over-collection may have caused local abundance to be suppressed. Although there is no evidence that this species is local abundant in intact habitats,
the majority of observations are from sites associated with native forest and *F. willsii* may be associated with this type of vegetation even if it does not require pristine habitat quality. The loss, degradation and fragmentation of these habitats may therefore represent a threat to *F. willsii*.

**Conservation measures**

*Furcifer willsii* is found inside or on the edge of Parc National d’Analamazaotra, Parc National de Ranomafana (Raselimanana and Rakotomalala 2003) and two new protected areas, Anjozorobe-Angavo (Raselimanana and Andriamampionona 2007) and Zahamena-Ankeninehy (Rabibisoa et al. 2005). It is listed as a protected species under Category I, Class II, which permits authorized collection from the wild.

**IUCN Red Listing**

This species has not previously been assessed on the IUCN Red List. It was considered Data Deficient by the IUCN/SSC Conservation Breeding Specialist Group (CBSG 2002).
Furcifer willsii
Appendix 2
Photo of all participants on the IUCN Red List assessments of Madagascar reptile species held in Antananarivo from January, 24th to 28th 2011.
### Appendix 3
Scientific publications on chameleon conservation

<table>
<thead>
<tr>
<th>Year</th>
<th>Authors &amp; Title</th>
<th>Journal/Book</th>
<th>Vol/Pages</th>
</tr>
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</table>
Appendix 4

Map showing the distribution of *Furcifer belalandaensis* (red circle) in the Sakabera and Belalanda villages during October 2008, March 2009, November & December 2009, and March-April 2010. Transect lines (black circle), shrub and tree for monitoring (green circle), spiny forest (orange), lake (grey), and river (Blue).
Appendix 5

Poster on chameleon diversity in Madagascar.
Appendix 6

Photo of the children and teacher from the primary school during the education project in Belalanda south-western Madagascar.

Photo of the children and teacher from the primary school with the team during the education project in Sakabera south-western Madagascar.
Appendix 7

Photos of the winners from Belalanda (left) and Sakabera (right) primary schools.

Photos of the drawings done by the children from Belalanda (left) and Sakabera (right) primary schools.
Appendix 8

Photo of the training event for two associations FIMAB in Belalanda, and FITAMITO in Sakabera.
Appendix 9

Conservation status of Malagasy chameleons (*Furcifer* and *Calumma*) and compliance with CITES Article IV

A report to the CITES Scientific Authority for Animals in Madagascar

January 2010

Report authors:

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By Madagasikara Voakajy and DICE
## Appendix 10

List of participants to the workshop meeting on non-detriment finding

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution / Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr Alison Rosser</td>
<td>Durrell Institute of Conservation and Ecology</td>
</tr>
<tr>
<td>Dr Richard Jenkins</td>
<td>Durrell Institute of Conservation and Ecology</td>
</tr>
<tr>
<td>Mme Lydie Rahurimaniruka</td>
<td>CITES Management Authority</td>
</tr>
<tr>
<td>Mme Sahendra Rabehlanaka</td>
<td>Representant CBD Point Focal</td>
</tr>
<tr>
<td>Pr Lydia Rabefafika</td>
<td>Department of Animal Biology, Scientific Authority</td>
</tr>
<tr>
<td>Dr Janta Razafrindraibe</td>
<td>Department of Animal Biology, Scientific Authority</td>
</tr>
<tr>
<td>Dr Achille Raselimananana</td>
<td>Department of Animal Biology, Scientific Authority</td>
</tr>
<tr>
<td>Dr Jeanne Rasamy</td>
<td>Department of Animal Biology, Scientific Authority</td>
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<tr>
<td>Dr Aristide Andriamirenisa</td>
<td>Department of Animal Biology, Scientific Authority</td>
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<tr>
<td>Dr Marie Jeanne Raherrilala</td>
<td>Department of Animal Biology, Scientific Authority</td>
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<tr>
<td>Mr Felix Rakotondraparany</td>
<td>Department of Animal Biology, Scientific Authority</td>
</tr>
<tr>
<td>Dr Hery Rakotondravony</td>
<td>Consultant</td>
</tr>
<tr>
<td>Christian Ranirantocandry</td>
<td>Madagasikara Vocaajy</td>
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<tr>
<td>R. Andriantsirisanarilafy</td>
<td>Madagasikara Vocaajy</td>
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<td>Roma Randrianavelonara</td>
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<td>Harison Randrianasolo</td>
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<td>Tiana Ramahaleo</td>
<td>WWF Species Program Madagascar</td>
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<tr>
<td>N. A. Rakotoxorazafy</td>
<td>DBA (PhD student, frogs)</td>
</tr>
<tr>
<td>G. F. Razafindrakoto</td>
<td>DBA (PhD student, chameleons)</td>
</tr>
<tr>
<td>Parfait Bora</td>
<td>DBA (PhD student, frogs)</td>
</tr>
<tr>
<td>Sando Mahaviasy</td>
<td>DBA (PhD student, reptile)</td>
</tr>
<tr>
<td>P. Mamory</td>
<td>DBA (DEA student, chameleons)</td>
</tr>
<tr>
<td>M. Andriansanona</td>
<td>DBA (DEA student, chameleons)</td>
</tr>
<tr>
<td>C. Radufiarimanana</td>
<td>DBA (DEA student, chameleons)</td>
</tr>
<tr>
<td>Attalao Ravooarimalala</td>
<td>SP CITES Faune</td>
</tr>
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</table>
Appendix 11
Madagascar Chameleons
A report to the CITES Animals Scientific Authority of Madagascar by Madagasikara Voakajy and DICE

Abstract. During a meeting on 1.2.10 the Malagasy Scientific Authority for Animals recommended that 16 species of chameleons be listed as potentially suitable for sustainable trade in line with CITES Article IV:

Résumé. Au cours d’une réunion du 1er février 2010, l'autorité scientifique Malgache pour la faune a recommandé que 16 espèces de caméléons soient répertoriées comme étant potentiellement favorables au commerce durable en conformité avec l'article IV de la CITES :

On the 6th August 2009 the CITES Secretariat wrote to the Management Authority in Madagascar to inform them about the decisions made during the 24th meeting of the Animals Committee and the 58th meeting of the Standing Committee.

Species belonging to the chameleon genera Calumma and Furcifer, and the day gecko genus Phelsuma, were assessed by a consultant and each taxon was attributed to one of four categories. These categories defined which species were candidates for resumed trade (C3 & C4) and which were unlikely to meet the conditions of Article IV and should not be traded (C1& C2). Madagascar was sent the annotated species list and encouraged to comment on the taxa listed as C1 and C2. It was also informed of the three conditions set by the Standing Committee pertaining to the trade in C3 and C4 species.

A meeting was then organised by the CITES Management and Scientific Authority (Fauna) in Madagascar during October 2009 to discuss the letter from the Secretariat. It was decided that the Scientific Authority (Fauna) and other experts would review the list of species sent by CITES and a Malagasy organisation (Madagasikara Voakajy) agreed to prepare a report by the end of January 2010.

The Madagasikara Voakajy report was circulated to the Scientific Authority (Fauna) and other experts in Madagascar two weeks before a meeting on 1st February 2010 (see supporting documents).

General Points from meeting on 1.2.10
1. Concern was raised by the SA about the lack of recent information on Calumma species. Although there have been a number of recent studies on Furcifer species (Karsten et al. 2009; Randrianantoandro et al. 2008; Randrianantoandro et al. 2010), data pertaining to Calumma were mostly collected over a decade ago (Brady & Griffiths 1999; Jenkins et al. 2003; Jenkins et al. 1999).

2. Concern was raised by the SA about some of the statements on chameleon reproductive capacity in the original chameleon assessment (AC24 Doc. 7.2) because they were based on animals in captivity. Recent evidence indicates that some chameleon species are short lived and there is very little data available on clutch size in the wild (Andreone et al. 2005; Glaw & Vences 2007; Karsten et al. 2008).
3. The SA noted that it would be helpful to establish a procedure for it to recommend moving species between the different C categories to take into account new information.

Chameleons
The information in the table below summarizes the C-categories given to each *Furcifer* and *Calumma* species in the AC24 Doc. 7.2 and the recommendations made by the Madagascar Scientific Authority (Fauna) on 1st February 2010.

<table>
<thead>
<tr>
<th>Species</th>
<th>AC24 Recom.</th>
<th>Scientific Authority (Fauna): Madagascar</th>
<th>Information available on population size and density</th>
<th>Occurrence in sites from where collection is permitted</th>
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<tr>
<td><em>F. angeli</em></td>
<td>C2</td>
<td>C2</td>
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**C1 species**

AC24 Doc. 7.2 identified nine C1 species. These were retained by the SA and a further three species are recommended to be included in this category:

- *Calumma ambreeise* because it is only known from one strict protected area
- *Calumma peltierorum* because it is only known from two strict protected areas
- *Furcifer timoni* because it is only known from two strict protected areas

**C2 species**

AC24 Doc. 7.2 identified 12 C2 species. These were all retained with the exception of *C. peltierorum* (recommended C1) and *C. linotum* was not considered based on Glaw and Vences (2007). The SA recommended that *C. andringitraense, C. fallax, C. gallus* and *C. malthe* are moved to C2 because of a lack of information about their biology, abundance, distribution and taxonomy.

**C3 species**

AC24 Doc. 7.2 identified 14 C3 species. The SA recommended that three of these species are moved to C2 (*C. andringitraense, C. fallax* and *C. gallus*).

**C4 species**

AC24 Doc. 7.2 identified 8 C4 species. The SA recommended that three of these species (*C. boettgeri, C. globifer* and *C. oshaughnessyi*) are moved to C3 because although they are relatively widespread there is very little information available on population status in the areas from where collection is permitted. The SA also recommended that one species (*C. malthe*) is moved to C2 because it is mostly restricted to protected areas.

The final list of 16 chameleon species for which Madagascar will work towards delivering non-detrimental findings (the conditions stipulated in the letter of 6.8.09) are as follows:

- *C. boettgeri, C. brevicorne, C. crypticum, C. guillaumeti, C. gastrotaenia, C. globifer, C. marojezense, C. oshaughnessyi, C. parsoni, C. vencesi*
- *F. antimena, F. campani, F. minor, F. petteri, F. rhinoceratus, F. willsii*

The SA noted the strong resemblance between certain C3/C4 species and C1/C2 species and identified the need to develop new resources for the Management Authority to enable the correct determination of species in the trade to ensure that no C1 or C2 species are mistakenly exported. There is therefore a need to develop materials for the *gastrotaenia, brevicorne* and *nasutum* groups.
Appendix 12

Proposition pour la réouverture de l’exportation des caméléons collectés dans les milieux sauvages à Madagascar

Résumé

Les Autorités CITES et experts en reptiles à Madagascar se sont réunis maintes fois pour contempler la réouverture de l’exportation de certains espèces de caméléons à la réponse de la demande provenant du Secrétariat CITES. Des données suffisantes sont disponibles pour promouvoir les avis de commerce non-préjudiciable sur le quota annuel des sept parmi les huit espèces considérées. Les informations détaillées pour chaque espèce sont fournis ici en plus du résumé dans le tableau situé ci-dessous :

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<tr>
<th>Espèce</th>
<th>Évaluation du risque</th>
<th>Quota prévisionnel</th>
<th>Évaluation d’impact</th>
<th>Quota recommandé pour AS et OG</th>
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<tr>
<td>C. brevicorne</td>
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## Contents

<table>
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<th>C. brevicorne</th>
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<tr>
<td>C. crypticum</td>
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<td>Annexe 3</td>
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<td>Annexe 4</td>
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<td>Annexe 5</td>
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</table>
Proposition pour la réouverture de l’exportation des caméléons collectés dans les milieux sauvages à Madagascar : *Calumma brevicorne*

**Contexte**

Étant donné que :
- Les espèces de caméléons Malagasy du genre *Calumma* et *Furcifer* sont inclues dans l’Annexe II et actuellement couverte par la notification 833 (Janvier 1995) ;
- Madagascar a amélioré significativement sa capacité pour l’implémentation de la CITES après la suspension du commerce ;
- Quelques caméléons sont suffisamment abondants pour tolérer une collecte modérée dans le milieu sauvage ;
- Les caméléons sont fortement demandés dans le commerce international des animaux de compagnie ;
- Les caméléons venant de Madagascar sont sujets à une exportation illicite continue ;
- CITES a invité Madagascar à considérer la réouverture du commerce des certaines espèces de caméléon ;
- Il y a un nouveau guidage disponible pour la réalisation des avis de commerce non-préjudiciable (NDF) ;

Les Autorités CITES à Madagascar, en collaboration avec les experts appropriés ont mené les activités suivantes :
- Une réunion a eu lieu à Antananarivo en octobre 2009 pour discuter la lettre provenant du secrétariat CITES (ANNEXE 1) ;
- L’Organe de Gestion (OG) et l’Autorité Scientifique (AS) CITES Madagascar ont demandé Madagasikara Voakajy (*www.madagasikara-voakajy.org*) de réviser la liste des espèces et les catégories prévisionnels (C1-C4) ;
- Madagasikara Voakajy a soumis le rapport à l’OG et l’AS en janvier 2010 (ANNEXE 2) ;
- L’OG, l’AS et les experts appropriés se sont réunis le 01 février 2010 et ont agréé la liste des espèces dans chaque « C » catégorie (ANNEXE 3) ;
- Un atelier sur les avis de commerce non-préjudiciable (NDF) a eu lieu le 9-10 février 2010 à Antananarivo pour développer le chemin à suivre pour les scientifiques et l’AS à Madagascar pour délivrer NDF (ANNEXE 4) ;
- L’OG, l’AS et experts appropriés se sont réunis le 13 décembre 2010 et une nouvelle méthode a été développé pour le calcul du quota pour les caméléons (ANNEXE 5) ;
- Un comité de rédaction constitué par les représentants de l’OG, l’AS, Madagasikara Voakajy et l’IUCN/SSC Chameleon Specialist Group a été établi pour évaluer le nouvel quota obtenu en utilisant la formule, envers les avis de commerce non-préjudiciable.

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1 AC23 Doc. 8.2
2 AC24 Doc. 7.2
3 SC58 Doc. 21.3 (Rev. 1)
4 AC24 Doc. 9.1 (Reptile and Amphibian Working Group)
Calumma brevicorne
Quota = 579

Suivant les recommandations du group de travail sur le NDF nous avons mené une évaluation préliminaire du risque. Ceci s’était basé sur les principes que CITES a fourni pour Madagascar en relation avec les caméléons (et les geckos diurnes) et suit la terminologie correspondante :

Évaluation du risque : Bas (‘C4’ sensu SC58 Doc. 21.3 (Rev. 1))

Justification brève (voir les documents d’appuis p. 6-11 pour les détails) :
1. Espèce à large distribution
2. Se trouve dans des habitats fragmentés et perturbés
3. Quelques données sur la densité de la population sont disponibles

Quota proposé = 579

Ce quota est obtenu selon la procédure suivante :

Densité de la population :
Moyenne des cinq séries estimée entre 1,3 ha⁻¹ et 3,9 ha⁻¹ (Brady & Griffiths 1999)
= 2,4 ha⁻¹

Zone d’occurrence :
La surface de forêt dans les localités où l’existence de cette espèce a été confirmée (en excluant la région de Diana)
= 1 207 300 ha

Taille de la population nationale :
La population estimée des adultes et juvéniles dans la localité où l’existence de cette espèce existe :
= taille de la population nationale (2,4) x zone d’occurrence (1 207 300)
= 2 897 520 individus

Taille de la population hors aires protégées :
Dans l’absence d’information précise, nous estimons que 10% de la surface de forêt dans les localités où cette espèce existe se trouve dans les zones où la collecte est autorisée
= population estimée (2 897 520 individus) x 0,1
= 289 752 individus

Taille de la population viable :
A partir de la population viable au dessus, nous estimons de façon prudente que 80% sont disparus annuellement suite aux causes naturelles et perte en habitat
= population estimée en dehors des aires protégées (289 752 individus) x 0,2
= 57 950 individus

Taille de la population pouvant être collecté :
De la population à partir de la quelle les collectes peuvent avoir lieu, nous proposons que la collecte de 10% de cette population est apparemment pour être durable
= population viable x 0,1
= 5 795 individus

Quota Annuel :
Nous proposons un quota annuel qui représente le 10% de la population pouvant être collectée
= population pouvant être collectée (5 795 individus) x 0,1
= 579
Évaluation des Avis de Commerce Préjudiciables

Réflexions en évaluant l’impact potentiel de la collecte de cette espèce :
- Due aux développements récents dans la taxonomie de cette espèce et de ses quelques congénères, sa distribution est très mal connue et a besoin d’être réévaluée. Elle pourrait se trouver dans une plus grande surface que celle qui est considérée dans cette évaluation ;
- Cette espèce a été auparavant jugée capable de tolérer une collecte annuelle modérée ;
- L’information sur la densité de la population est très limitée ;
- La forme de cette espèce est similaire à celle de *Calumma amber* et *Calumma crypticum*. Confusion avec la dernière n’est pas un grand problème car elle est une espèce à distribution relativement large mais la confusion avec la première est majeur car elle est endémique au Parc National de Montagne d’Ambre dans la région de Diana ;
- Les taux de mortalité des caméléons Malagasy dans le commerce, entre la collecte et la livraison, sont mal connus.

Décision et Justification :
Un quota de 579 individus serait non-préjudiciable si:
- Aucun permis de collecte n’est délivré pour la région de Diana (où *Calumma amber* se trouve) ;
- Permis de collecte sont délivrés pour s’assurer que les collectes dans les milieux sauvages s’effectuent dans différentes forêts, et de préférence dans différents lieux administratifs (ex. Régions ou Districts) ;
- Un programme de formation, d’abord aux opérateurs et ensuite au personnel de l’OG qui vérifie les envois, est initié ;
- L’OG informe l’AS sur le nombre de *C. brevicorne* exporté annuellement ;
- Le quota est évalué en 2011 après l’atelier sur la Liste Rouge des reptiles Malagasy (24-28 janvier) quand les cartes de distribution mise à jour seront disponibles.

Préparé par

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Durrell Institute of Conservation and Ecology, Madagasikara Voakajy & IUCN/SSC Chameleon Specialist Group

Dr. Emilienne Razafimahatratra
Autorité Scientifique (Département de Biologie Animale, Université d’Antananarivo)

Sahondra Rabesihanaka
Organe de Gestion (Service de la Gestion de la Faune et de la Flore, Ministère de l’Environnement et des Forêts)
Supporting statement: *Calumma brevicorne*

1. TAXONOMY
   1.1 Class
       Reptilia
   1.2 Order
       Squamata
   1.3 Family
       Chamaeleonidae
   1.4 Genus, species or subspecies, including author and year
       *Calumma brevicorne* (Günther, 1879)
   1.5 Scientific synonyms
       *Chamaeleo brevicornis* Günther, 1879
       *Chamaeleo brevicornis brevicornis* Günther, 1879
       *Chamaeleo brevicornis tsarafidy* Brygoo & Domergue, 1970
       *Chamaeleon brevicornis* Günther, 1879
       *Chamaeleon gularis* Günther, 1879
   1.6 Common names (including, where appropriate, trade names)
       Short-horned Chameleon
   1.7 Code numbers
       If the species concerned is already included in the Appendices, refer to the code numbers in the CITES Identification Manual.

       A-303.005.002.012

2. SPECIES STATUS
   2.1 IUCN Red List Category
       This species has not yet been evaluated for the IUCN Red List (www.redlist.org accessed 18.09.2010).
   2.2 National legislation
       Category I, Class II (listed as *Calumma brevicornis*) of (Annexe au décret n°. 2006 - 400 du 13 juin 2006 portant classement des espèces de faune sauvages).
   2.3 CITES Appendix listing
       Appendix II (date listed: 04/02/1977)

3. SPECIES CHARACTERISTICS
   3.1 Distribution
       The distribution of this species is poorly known because it was subject to a taxonomic revision that resulted in the discovery of previously unknown species within the taxon *Calumma brevicorne* (Raxworthy and Nussbaum2006). Although voucher collections of the *C. brevicorne* group need to be revised in light of the taxonomic revision to provide a better assessment of its geographic distribution, Raxworthy and Nussbaum(2006) confirmed this species present in a number of localities from the north (near Tsaratanana) to the south (near Fort Dauphin) of the island. It therefore has a wide latitudinal distribution but it seems to have a restricted elevational range, extending from around 800 m to 1000 m above sea-level (Raxworthy and Nussbaum2006). Suitable forest habitat exists throughout the latitudinal range of *C. brevicorne* but an assessment of whether its occurrence is continuous requires additional information (either from new surveys or re-assessments of voucher collections). A recent assessment calculated the extent of occurrence for this species as 12,668 km²;
this is almost certainly significantly lower than the real distribution and future updates will be necessary.

3.2 Habitat
This species inhabits mid-elevation humid forests between 800 m and 1000 m above sea-level (Raxworthy and Nussbaum 2006). In the Analamazoatra Special Reserve *C. brevicorne* has been found roosting in degraded humid forest and roadside areas with exotic tree species (Brady and Griffiths 1999). Other reports of this species using disturbed forest need to be revisited in view of the recent taxonomic changes (e.g. Jenkins et al. 1999, 2003).

3.3 Biological characteristics
It is not clear whether the previously published information on the biology of this species refer to *C. brevicorne* or other closely-related taxa (Glaw and Vences 2007).

3.4 Morphological characteristics
Raxworthy and Nussbaum (2006) reviewed the taxonomy of the large (> 100 mm snout-vent length) *Calumma* chameleons with well-developed occipital-lobes. Males are distinguished from other closely-related species by the presence of a single ossified, laterally-flattened, rostral appendage at least 2.5 mm in length with three longitudinal scale rows. The large occipital-lobes are dorsally united. It most closely resembles *Calumma amber* and *Calumma crypticum* but males of *C. brevicorne* can be distinguished by occipital lobes that always reach a level at or below the ventral margin of the eye orbit. Female *C. amber*, *C. brevicorne* and *C. crypticum* cannot be distinguished using morphology but there are some differences in life coloration (Glaw and Vences 2007). *Calumma brevicorne* females are green or brown with a pale spot or line posterior to the eye on the temporal crest; *Calumma amber* females are green or brown but lack the pale eye markings of *C. brevicorne*. Female *C. brevicorne* (max SVL 140 mm) are typically larger than *C. crypticum* (max SVL 111 mm). Two of the three known adult female *C. brevicorne* specimens exceed the max SVL of all measured female crypticum (n=28), and Vences and Glaw (1994) reported female *C. brevicorne* at Andasibe as between 110-140 mm SVL (n=10). Female amber do not have periodicity in dorsal crest tubercle size, which does occur (although variable) in *C. crypticum* and *C. brevicorne* females.

3.5 Role of the species in its ecosystem
The ecological role of chameleons is poorly known in Madagascar. Most species however feed on invertebrates. There is unlikely to be a significant impact on the ecosystem from removing small numbers of *C. brevicorne*.

4. Status and Trends
4.1 Habitat trends
The deforestation rate in Madagascar’s humid forests was calculated at 0.8% between 1990 and 2000 (Harper et al. 2007) and 0.23% between 2000 and 2005 (MEFT et al. 2009). The amount and quality of habitat for this species is declining. Humid forest is subject to different threats, including selective logging, bushfires and clearance for agriculture.

4.2 Population size
The population density of *C. brevicorne* from Mantadia National Park was calculated as 2.4 individuals ha⁻¹ (Brady and Griffiths 1999). Brady and Griffiths (1999) estimated a population size for *C. brevicorne* of between 1,194,520 and 101,832,830 individuals. However, based on the taxonomic work of Raxworthy and Nussbaum (2006) this estimate includes a number of species and is no longer valid for *C. brevicorne*. An assessment of the population size of this species is needed.

4.3 Population structure
It is not known with certainty if the earlier published information on *C. brevicorne* refers to this or taxa that have been described recently (Glaw and Vences 2007).
4.4 Population trends
There is no information available on the population trends of *C. brevicorne*.

4.5 Geographic trends
There is no information available on the population trends of *C. brevicorne* and any assessment would be confounded by recent taxonomic work because the identification all most voucher specimens prior to 2006 needs to be re-assessed.

5. Threats
5.1 Nature
*Calumma brevicorne* inhabits mid-elevation humid forest and although it appears to be tolerant of some levels of habitat degradation, possibly through a preference for open-areas within forests, it nevertheless appears to require relatively intact forest for survival (Raxworthy and Nussbaum 2006; Glaw and Vences 2007). Mid-elevation humid forest in Madagascar is subject to a range of threats both inside and outside protected areas. A rapidly growing human population with a widespread dependence on subsistence agriculture and fuel wood cutting makes deforestation in Madagascar difficult to slow. The use of fire in zebu cattle grazing and slash-and-burn agriculture are major contributors to the decline in forest area and quality (Harper et al. 2007). The extractive industry, including minerals, gems and timber, also contribute to deforestation.

5.2 Intensity
There is little available information on the intensity of the threats although there are lower deforestation rates in the strict protected parks than unprotected areas of eastern Madagascar. A full consideration of the impact of spatial variation in the nature and intensity of habitat degradation cannot be completed until the geographic distribution of the taxon is updated.

5.3 Relative importance of any human-induced threats
All of the threats to this species are human-induced and habitat loss is the most important.

6. Utilization and trade
6.1 National utilization
A few animal parks in Madagascar keep chameleons are these probably include small numbers of *C. brevicorne*. Exports of this species from Madagascar were suspended by CITES in 1994 so there is minimal utilization of *C. brevicorne* at the national level (Carpenter et al. 2004, 2005).

6.2 Legal trade
Information accessed from the CITES/WCMC Trade Database database shows that *C. brevicorne* represented 26% of the 27,261 individual chameleons imported from Madagascar in the period between 1978 and 2008. From the 6,578 live *C. brevicorne* exported from Madagascar for commercial purposes, all were from the period between 1987 and 1995. A total of 104 different consignments are present in the database and 72% were for commercial purposes and 21% for scientific research, with the remainder for breeding or education projects. Thus, prior to the 1994 trade suspension for all *Calumma* exported from Madagascar *C. brevicorne* was in commercial demand and export numbers were second only to *Calumma parsonii*.

6.3 Parts and derivatives in trade
There is no evidence that chameleon body parts or other derivatives are traded internationally.

6.4 Illegal trade
In a recent survey of chameleon traders in Bangkok TRAFFIC encountered six *Calumma* species from Madagascar on sale but *C. brevicorne* was not observed. This survey lasted three weeks and repeat surveys over a longer period are needed to establish whether *C. brevicorne* is traded illegally. The presence of other *Calumma* species, including *C. matthe*, in Thailand’s reptile markets makes it probable that *C. brevicorne* is included in the illegal trade but data on numbers are lacking.
6.5 Actual or potential trade impacts
Because of the wide geographic range of *C. brevicorne*, its local abundance and its tolerance of some habitat disturbance it can probably withstand a modest harvest. Caution is needed however because of the fragmented nature of its distribution and it should not be assumed that the species has a continuous occurrence between isolated localities. A small annual harvest is unlikely to threaten *C. brevicorne*.

7. Legal Instruments
7.1 National
All *Calumma* species from Madagascar were suspended from trade in 1994 (Carpenter et al. 2004, 2005). Indeed, Madagascar has only been permitted to export four very common species of *Furcifer* chameleons since 1994. Existing legislation permits the collection of *C. brevicorne* providing the CITES Management and Scientific authorities provide authorization. There have been no major issues raised by CITES regarding Madagascar’s export of four *Furcifer* species and this suggests that the procedures that are already in place for managing trade in common, unthreatened, species is effective.

7.2 International
This species is not protected internationally, but trade is controlled under the auspices of CITES.

8. Species Management
8.1 Management measures
There are no programmes in place in Madagascar to manage *C. brevicorne* because exports of this species have been suspended since 1994.

8.2 Population monitoring
There are no programmes in place in Madagascar to manage *C. brevicorne* because exports of this species have been suspended since 1994. Because *C. brevicorne* is not a conservation priority it is unlikely that funding will be consistently available to monitor the species.

8.3 Control measures
8.3.1 International
As an Appendix II species exports and imports of *C. brevicorne* will be subject to standard CITES procedures.

8.3.2 Domestic
Harvest quotas are produced and assessed by the Scientific Authority for Animals (Department of Animal Biology at the University of Antananarivo).

8.4 Captive breeding and artificial propagation
Whilst *C. brevicorne* is found in captivity in Madagascar (e.g. Madagascar Exotic), there is no information available that suggests these programme are linked to supplying the commercial demand or are associated with captive breeding.

8.5 Habitat conservation
Knowledge of the presence of this species in forests that are subject to some form of conservation is incomplete but it is known to occur in Parc National d’Andohahela and Réserve Spéciale d’Analamazoatra (Glaw and Vences 2007).

9. Information on similar species
The group of chameleons composing *Calumma amber*, *Calumma crypticum* and *Calumma brevicorne* are morphologically similar (Raxworthy and Nussbaum 2006). The correct identification of these species poses a challenge to their sustainable and legal trade. We propose two approaches to overcome this challenge:
i. Limit wild collection to the administrative regions of Madagascar where look-a-like species of conservation concern do not occur

ii. Provide training to chameleon exporters and custom officials to include
   a. Identification booklets
   b. Hands-on training with herpetologists

10. Consultations

Prepared by Richard Jenkins, Christian Randrianantoandro and Chris Raxworthy

11. References


Proposition pour la réouverture de l’exportation des caméléons collectés dans les milieux sauvages à Madagascar : *Calumma crypticum*

**Contexte**

Étant donné que :
- Les espèces de caméléons Malagasy du genre *Calumma* et *Furcifer* sont incluses dans l’Annexe II et actuellement couverte par la notification 833 (Janvier 1995) ;
- Madagascar a amélioré significativement sa capacité pour l’implémentation de la CITES après la suspension du commerce ;
- Quelques caméléons sont suffisamment abondants pour tolérer une collecte modérée dans le milieu sauvage ;
- Les caméléons sont fortement demandés dans le commerce international des animaux de compagnie ;
- Les caméléons venant de Madagascar sont sujets à une exportation illicite continue ;
- CITES a invité Madagascar à considérer la réouverture du commerce des certaines espèces de caméléon ;
- Il y a un nouveau guidage disponible pour la réalisation des avis de commerce non-préjudiciable (NDF) ;

Les Autorités CITES à Madagascar, en collaboration avec les experts appropriés ont mené les activités suivantes :
- Une réunion a eu lieu à Antananarivo en octobre 2009 pour discuter la lettre provenant du secrétariat CITES (ANNEXE 1) ;
- L’Organe de Gestion (OG) et l’Autorité Scientifique (AS) CITES Madagascar ont demandé Madagasikara Voakajy (www.madagasikara-voakajy.org) de réviser la liste des espèces et les catégories prévisionnels (C1-C4) ;
- Madagasikara Voakajy a soumis le rapport à l’OG et l’AS en janvier 2010 (ANNEXE 2) ;
- L’OG, l’AS et les experts appropriés se sont réunis le 01 février 2010 et ont agréé la liste des espèces dans chaque « C » catégorie (ANNEXE 3) ;
- Un atelier sur les avis de commerce non-préjudiciable (NDF) a eu lieu le 9-10 février 2010 à Antananarivo pour développer le chemin à suivre pour les scientifiques et l’AS à Madagascar pour délivrer NDF (ANNEXE 4) ;
- L’OG, l’AS et experts appropriés se sont réunis le 13 décembre 2010 et ont développé une nouvelle méthode pour le calcul du quota pour les caméléons (ANNEXE 5) ;
- Un comité de rédaction constitué par les représentants de l’OG, l’AS, Madagasikara Voakajy et l’IUCN/SSC Chameleon Specialist Group a été établi pour évaluer le nouvel quota obtenu en utilisant la formule, envers les avis de commerce non-préjudiciable.
*Calumma crypticum*

*Quota = 530*

Suivant les recommandations du group de travail sur le NDF nous avons mené une évaluation préliminaire du risque. Ceci s’était basé sur les principes que CITES a fourni pour Madagascar en relation avec les caméléons (et les geckos diurnes) et suit la terminologie suivante:

<table>
<thead>
<tr>
<th>Évaluation du risque</th>
<th>Bas (‘C4’ sensu SC58 Doc. 21.3 (Rev. 1))</th>
</tr>
</thead>
</table>

Justification brève (voir documents d’appuis p. 16-20 pour les détails):

1. Espèce à large distribution
2. Se trouve dans des habitats fragmentés et perturbés
3. Quelques données sur la densité de la population sont disponibles

**Quota proposé = 530**

Ce quota est obtenu selon la procédure suivante:

**Densité de la population** :
Les valeurs estimées par Jenkins et al. (1999) concernent seulement les pistes dans la forêt et l’autre information publiée peut se référer à *C. brevicorne* 1,2 ha\(^{-1}\) (Brady and Griffiths 1999). La seule densité consistante sur la densité de la population de cette espèce a été collectée à Itremo (Randrianantoandro et al. 2010). A cause de ce manque d’information, et sa similarité avec *C. brevicorne* (Raxworthy and Nussbaum 2006 ; Glaw and Vences 2007) nous avons pris en compte la valeur minimale de la densité 26,1ha\(^{-1}\).

**Étendue de la Zone d’occurrence** :
La surface de la zone forestière dans les localités où cette espèce a été confirmée présente (en excluant les régions de Diana et Anosy)
= 101 700 ha

**Taille de la population nationale** :
La population estimée des adultes et juvéniles dans les localités où cette espèce a été confirmée présente :
= densité de la population (26,1) x étendue de la zone d’occurrence (101 700) = 2 654 370 individus

**Taille de la population hors aires protégées** :
Du à l’absence d’information précise, nous estimons que 10% de la surface de la zone forestière dans les localités où cette espèce existe, se trouve dans les zones où la collecte est allouée
= population estimée (= 2 654 370 individus) x 0,1
= 265 437 individus

**Taille de la population viable** :
A partir de la population viable au dessus, nous estimons de façon prudente que 80% disparus annuellement suite aux causes naturelles et perte en habitat
= population estimée en dehors des aires protégées (265 437 individus) x 0,2
= 53 087 individus

**Taille de la population pouvant être collecté** :

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\(^9\)AC24 Doc. 9.1 (Reptile and Amphibian Working Group)
\(^10\)AC24 Doc. 7.2
De la population à partir de laquelle les collectes peuvent avoir lieu, nous proposons que la collecte de 10% de cette population est apparentement pour être durable
= population viable (53 087) x 0,1
= 5 308 individus

**Quota annuel** :
Nous proposons un quota annuel qui représente le 10% de la potentielle collecte disponible
= population pouvant être collectée (5 308 individus) x 0,1
= 530

**Évaluation des Avis de Commerce Précjudiciables**

Réflexions en évaluant l’impact potentiel de la collecte de cette espèce :
- Due aux développements récents dans la taxonomie de cette espèce et de ses quelques congénères, sa distribution est très mal connue et a besoin d’être réévaluée. Elle pourrait se trouver dans une plus grande surface que celle qui est considérée dans cette évaluation ;
- Cette espèce a été auparavant jugée capable de tolérer une collecte annuelle modérée ;
- L’information sur la densité de la population est très limitée ;
- La forme de cette espèce est similaire à *Calumma amber* et *C. brevicorne*. Confusion avec cette dernière n’est pas un grand problème car elle est une espèce à distribution relativement large mais la confusion avec la première est majeure car elle est endémique au Parc National de Montagne d’Ambre dans la région de Diana ;

**Décision et Justification** :

Un quota de 530 individus serait non-préjudiciable si:
- Aucun permis de collecte n’est délivré pour la région de Diana (où *Calumma amber* [C1] se trouve) ou dans la région de l’Anosy (où *Calumma tsycorne* [C2] se trouve) ;
- Permis de collecte sont délivrés pour s’assurer que les collectes dans les milieux sauvages s’effectuent dans différentes forêts, et de préférence dans différents lieux administratifs (ex. Régions ou Districts) ;
- Un programme de formation, d’abord aux opérateurs et ensuite au personnel de l’OG qui vérifie les envois, est initié ;
- Le quota est évalué en 2011 après l’atelier sur la Liste Rouge des reptiles Malagasy (24-28 janvier) quand les cartes de distribution mise à jour seront disponibles ;
- L’OG informe l’AS sur le nombre de *C. crypticum* exporté annuellement.

**Préparé par**

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Sahondra Rabesihanaka
Organe de Gestion
(Service de la Gestion de la Faune et de la Flore, Ministère de l’Environnement et des Forêts)
Supporting statement: *Calumma crypticum*

1. **TAXONOMY**
   1.1 Class
      Reptilia

   1.2 Order
      Squamata

   1.3 Family
      Chamaeleonidae

1.4 Genus, species or subspecies, including author and year
*Calumma crypticum* Raxworthy and Nussbaum 2006

1.5 Scientific synonyms
None

1.6 Common names (including, where appropriate, trade names)
Cryptic Chameleon

1.7 Code numbers
If the species concerned is already included in the Appendices, refer to the code numbers in the CITES Identification Manual.

It is not included.

2. **SPECIES STATUS**
2.1 IUCN Red List Category
This species has not yet been evaluated for the IUCN Red List (www.redlist.org accessed 18.09.2010).

2.2 National legislation
Category I, Class II (listed as *Calumma brevicornis*) of (Annexe au décret n°. 2006 - 400 du 13 juin 2006 portant classement des espèces de faune sauvages).

2.3 CITES Appendix listing
Appendix II (date listed: 04/02/1977), with all *Calumma* species.

3. **SPECIES CHARACTERISTICS**
3.1 Distribution
The distribution of this species is poorly known because it was subject to a taxonomic revision that resulted in the discovery of previously unknown species within the taxon *Calumma brevicorne* (Raxworthy and Nussbaum 2006). Although voucher collections of the *C. crypticum* group need to be revised in light of the taxonomic revision to provide a better assessment of its geographic distribution, Raxworthy and Nussbaum (2006) confirmed this species present in a number of localities from the north (near Tsaratanana) to the south (near Fort Dauphin) of the island. It therefore has a wide latitudinal distribution but it seems to have a restricted elevational range, extending from around 800 m to 1000 m above sea-level (Raxworthy and Nussbaum 2006). Suitable forest habitat exists throughout the latitudinal range of *C. crypticum* but an assessment of whether its occurrence is continuous requires additional information (either from new surveys or re-assessments of voucher collections).

3.2 Habitat
This species inhabits mid-elevation humid forests between 800 m and 1870 m above sea-level (Raxworthy and Nussbaum 2006).
3.3 Biological characteristics
It is not clear whether the previously published information on the biology of this species refer to *C. brevicorne* or other closely-related taxa (Glaw and Vences 2007). This species is sympatric with *C. brevicorne* at lower elevations (Raxworthy and Nussbaum 2006).

3.4 Morphological characteristics
Raxworthy and Nussbaum (2006) reviewed the taxonomy of the large (> 100 mm snout-vent length) *Calumma* chameleons with well-developed occipital-lobes. *Calumma crypticum* is most similar to *Calumma amber* but differs in three key characteristics: form of the female dorsal crest, male head color and length of the male rostral appendage (Raxworthy and Nussbaum 2006).

3.5 Role of the species in its ecosystem
The ecological role of chameleons is poorly known in Madagascar. Most species however feed on invertebrates. There is unlikely to be a significant impact on the ecosystem from removing small numbers of *C. crypticum*.

4. Status and Trends
4.1 Habitat trends
The deforestation rate in Madagascar’s humid forests was calculated at 0.8% between 1990 and 2000 (Harper et al. 2008) and 0.23% between 2000 and 2005 (MEFT et al. 2009). The amount and quality of habitat for this species is declining. Humid forest is subject to different threats, including selective logging, bushfires and clearance for agriculture.

4.2 Population size
The mean density of *C. crypticum* in forest fragments of Itremo was calculated as 39.7ha⁻¹ (Randrianantoandro et al. 2010).

4.3 Population structure
Jenkins et al. (1999) reported from Ranomafana National Park a sex ratio of 0.3 males to 0.7 females, with adults representing 88% of individuals and juveniles 22%. This study took place in the austral summer.

4.4 Population trends
There is no information available on the population trends of *C. brevicorne*.

4.5 Geographic trends
There is no information available on the population trends of *C. crypticum* and any assessment would be confounded by recent taxonomic work because the identification all most voucher specimens prior to 2006 needs to be re-assessed.

5. Threats
5.1 Nature
*Calumma crypticum* inhabits mid-elevation and montane humid forest and although it appears to be tolerant of some levels of habitat degradation, possibly through a preference for open-areas within forests, it nevertheless appears to require relatively intact forest for survival (Raxworthy and Nussbaum 2006; Glaw and Vences 2007). Mid-elevation and montane humid forest in Madagascar is subject to a range of threats both inside and outside protected areas. A rapidly growing human population with a widespread dependence on subsistence agriculture and fuel wood cutting makes deforestation in Madagascar difficult to slow. The use of fire in zebu cattle grazing and slash-and-burn agriculture are major contributors to the decline in forest area and quality (Harper et al. 2007). The extractive industry, including minerals, gems and timber, also contribute to deforestation.
5.2 Intensity
There is little available information on the intensity of the threats although there are lower deforestation rates in the strict protected parks than unprotected areas of eastern Madagascar. A full consideration of the impact of spatial variation in the nature and intensity of habitat degradation cannot be completed until the geographic distribution of the taxon is updated.

5.3 Relative importance of any human-induced threats
All of the threats to this species are human-induced.

6. UTILIZATION AND TRADE
6.1 National utilization
A few animal parks in Madagascar keep chameleons are these may include small numbers of *C. crypticum*. Exports of this species (as *C. brevicorne*) from Madagascar were suspended by CITES in 1994 so there is currently minimal utilization of *C. crypticum* at the national level (Carpenter et al. 2004, 2005).

6.2 Legal trade
Information accessed from the CITES/WCMC Trade Database shows that *C. brevicorne* represented 26% of the 27,261 individual chameleons imported from Madagascar in the period between 1978 and 2008. From the 6,578 live *C. brevicorne* exported from Madagascar for commercial purposes, all were from the period between 1987 and 1995. A total of 104 different consignments are present in the database and 72% were for commercial purposes and 21% for scientific research, with the remainder for breeding or education projects. Thus, prior to the 1994 trade suspension for all *Calumma* exported from Madagascar *C. brevicorne* was in commercial demand and export numbers were second only to *Calumma parsonii*.

6.3 Parts and derivatives in trade
There is no evidence that chameleon body parts or other derivatives are traded internationally.

6.4 Illegal trade
In a recent survey of chameleon traders in Bangkok TRAFFIC encountered six *Calumma* species from Madagascar on sale but *C. crypticum* was not observed. This survey lasted three weeks and repeat surveys over a longer period are needed to establish whether *C. crypticum* is traded illegally. The presence, though, of other *Calumma* species, including *C. malthe*, in Thailand’s reptile markets makes it probable that *C. crypticum* included in the illegal trade.

6.5 Actual or potential trade impacts
Because of the wide geographic range of *C. crypticum*, its local abundance and its tolerance of some habitat disturbance it can probably withstand a modest harvest. Caution is needed however because of the fragmented nature of its distribution and it should not be assumed that the species has a continuous occurrence between isolated localities. A small annual harvest is unlikely to threaten *C. crypticum*.

7. LEGAL INSTRUMENTS
7.1 National
All *Calumma* species from Madagascar were suspended from trade in 1994 (Carpenter et al. 2004, 2005). Indeed, Madagascar has only been permitted to export four very common species of *Furcifer* chameleons since 1994. There have been no major issues raised by CITES regarding Madagascar’s export of four *Furcifer* species (despite the fact that *Furcifer verrucosus*, *F. pardalis* and *F. lateralis* all have look-a-like congener that are of conservation concern: *F. nicosiai*, *F. tuzetae* and *F. belalandaensis*) and this suggests that the procedures that are in place for managing this trade in common, unthreatened, species are effective.

7.2 International
This species is not protected internationally, but trade is controlled under the auspices of CITES.
8. SPECIES MANAGEMENT

8.1 Management measures
There are no programmes in place in Madagascar to manage C. crypticum because exports of this species have been suspended since 2004.

8.2 Population monitoring
There are no programmes in place in Madagascar to monitor C. crypticum because exports of this species have been suspended since 2004. Because C. crypticum is not a conservation priority it is unlikely that funding will be consistently available to monitor the species.

8.3 Control measures
8.3.1 International
As an Appendix II species exports and imports of C. brevicorne would be subject to standard CITES procedures and control measures.

8.3.2 Domestic
Annual quotas are produced and assessed by the Scientific Authority for Animals (Department of Animal Biology at the University of Antananarivo).

8.4 Captive breeding and artificial propagation
This species is not captive bred in Madagascar.

8.5 Habitat conservation
Knowledge of the presence of this species in forests that are subject to some form of conservation is incomplete but it is known to occur in Parc National d'Andohahela, Parc National de Ranomafana and Réserve Spéciale d'Ambohitantely (Glaw and Vences 2007).

9. Information on similar species
The group of chameleons composing Calumma amber, Calumma crypticum and Calumma brevicorne are morphologically similar (Raxworthy and Nussbaum 2006). The correct identification of these species poses a challenge to their sustainable and legal trade. We propose two approaches to overcome this challenge:

iii. Prohibit wild collection in administrative regions of Madagascar where look-a-like species of conservation concern occur

iv. Provide training to chameleon exporters and custom officials to include
   a. Identification booklets
   b. Hands-on training with herpetologists

10. Consultations
Prepared by Richard Jenkins and Christian Randrianantoandro

11. References


Proposition pour la réouverture de l’exportation des caméléons collectés dans les milieux sauvages à Madagascar : *Calumma gastrotaenia*

**Contexte**

Étant donné que :
- Les espèces de caméléons Malagasy du genre *Calumma* et *Furcifer* sont inclues dans l’Annexe II et actuellement couverte par la notification 833 (Janvier 1995) ;
- Madagascar a amélioré significativement sa capacité pour l’implémentation de la CITES après la suspension du commerce ;
- Quelques caméléons sont suffisamment abondants pour tolérer une collecte modérée dans le milieu sauvage ;
- Les caméléons sont fortement demandés dans le commerce international des animaux de compagnie ;
- Les caméléons venant de Madagascar sont sujets à une exportation illicite continue ;
- CITES a invité Madagascar à considérer la réouverture du commerce des certaines espèces de caméléon ;
- Il y a un nouveau guidage disponible pour la réalisation des avis de commerce non-préjudiciable (NDF) ;

Les Autorités CITES à Madagascar, en collaboration avec les experts appropriés ont mené les activités suivantes :
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- Un atelier sur les avis de commerce non-préjudiciable (NDF) a eu lieu le 9-10 février 2010 à Antananarivo pour développer le chemin à suivre pour les scientifiques et l’AS à Madagascar pour délivrer NDF (ANNEXE 4) ;
- L’OG, l’AS et experts appropriés se sont réunis le 13 décembre 2010 et ont développé une nouvelle méthode pour le calcul du quota pour les caméléons (ANNEXE 5) ;
- Un comité de rédaction constitué par les représentants de l’OG, l’AS, Madagasikara Voakajy et l’IUCN/SSC Chameleon Specialist Group a été établi pour évaluer le nouvel quota obtenu en utilisant la formule, envers les avis de commerce non-préjudiciable.

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11 AC23 Doc. 8.2
12 AC24 Doc. 7.2
13 SC58 Doc. 21.3 (Rev. 1)
14 AC24 Doc. 9.1 (Reptile and Amphibian Working Group)
Calumma gastrotaenia
Quota = 2 057

Suivant les recommandations du group de travail sur le NDF nous avons mené une évaluation préliminaire du risque. Ceci s’était basé sur les principes que CITES a fourni pour Madagascar en relation avec les caméléons (et les geckos diurnes) et suit la terminologie correspondante :

Évaluation du risque : Bas (‘C4′ sensu SC58 Doc. 21.3 (Rev. 1))

Justification brève (voir documents d’appuis p. 24-28 pour les détails) :
7. Espèce à large distribution
8. Se trouve dans des habitats fragmentés et perturbés
9. Quelques données sur la densité de la population sont disponibles

Quota proposé = 2 057

Ce quota est obtenu selon la procédure suivante :

Densité de la population :
La valeur moyenne dans sept différentes zones forestières à partir de données collectées dans les années quatre vingt dix :
= 10.45 ha⁻¹

Étendue de la Zone d’occurrence :
La surface de la zone forestière dans les localités où cette espèce a été confirmée présente (en excluant les régions de Diana, Sava et Vatovavy Fitovinany) = 979 800 ha

Taille de la population nationale :
La population estimée des adultes et juvéniles dans les localités où cette espèce a été confirmée présente
= densité de la population (10,5) x étendue de la zone d’occurrence (979 800) = 10 287 900 individus

Taille de la population hors aires protégées :
Du à l’absence d’information précise, nous estimons que 10% de la surface de la zone forestière dans les localités où cette espèce existe, se trouve dans les zones où la collecte est allouée
= population estimée (= 10 287 900 individus) x 0,1
= 1 028 790 individus

Taille de la population viable
A partir de la population viable des caméléons au dessus, nous estimons de façon prudente que 80% disparus annuellement suite aux causes naturelles et perte en habitat
= population estimée en dehors des aires protégées (1 028 790 individus) x 0,2
= 205 758 individus

Taille de la population pouvant être collecté :
De la population à partir de la quelle les collectes peuvent avoir lieu, nous proposons que la collecte de 10% de cette population est apparentement pour être durable
= population estimée disponible pour la collecte (205 758) x 0,1
= 20 575 individus
Quota annuel :
Nous proposons un quota annuel qui représente le 10% de la potentielle collecte disponible
= population pouvant être collectée (20 575 individus) x 0,1
= 2 057

Évaluation des Avis de Commerce Préjudiciables
Réflexions en évaluant l’impact potentiel de la collecte de cette espèce :
- Cette espèce a été auparavant jugée capable de tolérer une collecte annuelle modérée ;
- Il y a une quantité rationnelle d’information disponibilité sur la densité de la population mais les donnés sont dépassées de dix ans ;
- Il n’y a pas information sur la biologie de l’espèce ;
- Des difficultés majeur peuvent se rencontrer en distinguant cette espèce de ses congénères16 ;
- Calumma vencesi était recensée dans les marchés illégales de reptile en Thaïlande en 2010 ;
- Suite à la suspension en 1994, il y avait seulement une faible demande en C. gastrotaenia ;

Décision et Justification :
Un quota de 2 057 individus serait non- préjudiciable si :
- Les permis de collecte sont seulement délivrés pour les Régions Alaotra Mangoro, Atsinanana, Analanjirofo et Analamanga
- Un programme de formation, d'abord aux opérateurs et ensuite au personnel de l’OG qui vérifie les envois, est initié ;
- Le quota est évalué en 2011 après l’atelier sur la Liste Rouge des reptiles Malagasy (24-28 janvier) quand les cartes de distribution mise à jour seront disponibles ;
- L’OG informe l’AS sur le nombre de C. gastrotaenia exporté annuellement.

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Supporting statement: *Calumma gastrotaenia*

1. TAXONOMY
1.1 Class
Reptilia

1.2 Order
Squamata

1.3 Family
Chameleontidae

1.4 Genus, species or subspecies, including author and year
*Calumma gastrotaenia* (Boulenger, 1888)

1.5 Scientific synonyms
None

1.6 Common names (including, where appropriate, trade names)
Perinét Chameleon

1.7 Code numbers
If the species concerned is already included in the Appendices, refer to the code numbers in the CITES Identification Manual.

A-303.005.002.029

2. SPECIES STATUS
2.1 IUCN Red List Category
This species has not yet been evaluated for the IUCN Red List ([www.redlist.org](http://www.redlist.org) accessed 18.09.2010).

2.2 National legislation
Category I, Class II of (Annexe au décret n°. 2006 - 400 du 13 juin 2006 portant classement des espèces de faune sauvages).

2.3 CITES Appendix listing
Appendix II (date listed: 04/02/1977), with all *Calumma* species.

3. SPECIES CHARACTERISTICS
3.1 Distribution
This is an endemic Malagasy species that is widespread in forested habitat in the east and south-east of the island (Glaw and Vences 2007).

3.2 Habitat
This species inhabits mid-elevation humid forests (Glaw and Vences 2007) where it occurs in degraded and relatively intact areas (Brady and Griffiths 1999).

3.3 Biological characteristics
There is no information on the biology of this species.

3.4 Morphological characteristics
A small green chameleon reaching a maximum of 142 mm in total length (Glaw and Vences 2007); rostral crest is present but there is no rostral appendage. Both sexes have a white lateral band on the head and flanks but this is less obvious in females (Glaw and Vences 2007).
3.5 Role of the species in its ecosystem
The ecological role of chameleons is poorly known in Madagascar. Most species however feed on invertebrates. There is unlikely to be a significant impact on the ecosystem from removing small numbers of *C. gastrotaenia*.

4. STATUS AND TRENDS

4.1 Habitat trends
The deforestation rate in Madagascar’s humid forests was calculated at 0.8% between 1990 and 2000 (Harper et al. 2008) and 0.23% between 2000 and 2005 (MEFT et al. 2009). The amount and quality of habitat for this species is declining. Humid forest is subject to different threats, including selective logging, bushfires and clearance for agriculture.

4.2 Population size
There are no reliable data on the national population size but density estimates have been made from a number of different sites (e.g. Brady and Griffiths 1999). The density of *C. gastrotaenia* in one site in the Anjozorobe-Angavo Corridor was calculated to be 89.6 ha\(^{-1}\) and 33.1 ha\(^{-1}\) in intact and disturbed forest respectively (Jenkins et al. 2003). In forests around Andasibe, densities of 5.9 ha\(^{-1}\), 0.8 ha\(^{-1}\), 14.5 ha\(^{-1}\), 10.1 ha\(^{-1}\), 29.0 and 3.3 ha\(^{-1}\) were recorded (Brady and Griffiths 1999). The latter data set includes a range of elevations and disturbance levels, and gives a mean of 10.5 ha\(^{-1}\) for the area concerned (Brady and Griffiths 1999).

4.3 Population structure
There are no reliable data on the population structure of this species.

4.4 Population trends
There is no information available on the population trends of *C. gastrotaenia*.

4.5 Geographic trends
There is no information available on the population trends of *C. gastrotaenia*.

5. THREATS

5.1 Nature
*Calumma gastrotaenia* inhabits mid-elevation humid forest and although it appears to be tolerant of some levels of habitat degradation it nevertheless appears to require relatively intact forest for survival (Brady and Griffiths 2009; Glaw and Vences 2007). Mid-elevation humid forest in Madagascar is subject to a range of threats both inside and outside protected areas. A rapidly growing human population with a widespread dependence on subsistence agriculture and fuel wood cutting makes deforestation in Madagascar difficult to slow. The use of fire in zebu cattle grazing and slash-and-burn agriculture are major contributors to the decline in forest area and quality (Harper et al. 2007). The extractive industry, including minerals, gems and timber, also contribute to deforestation.

5.2 Intensity
There is little available information on the intensity of the threats although there are lower deforestation rates in the strict protected parks than unprotected areas of eastern Madagascar.

5.3 Relative importance of any human-induced threats
All of the threats to this species are human-induced.

6. UTILIZATION AND TRADE

6.1 National utilization
A few animal parks in Madagascar keep chameleons are these are usually species larger than *C. gastrotaenia*. Exports of this species from Madagascar were suspended by CITES in 1994 so there is currently minimal utilization of *C. gastrotaenia* at the national level (Carpenter et al. 2004, 2005).
6.2 Legal trade
Information accessed from the CITES/WCMC Trade Database shows that *C. gastrotaenia* represented 1.7% of the 27,261 individual chameleons imported from Madagascar in the period between 1978 and 2008. From the 474 live *C. gastrotaenia* exported from Madagascar for commercial purposes, all were from the period between 1987 and 1995. Thus, prior to the 1994 trade suspension for all *Calumma* exported from Madagascar *C. gastrotaenia* was subject to relatively low commercial demand compared to *Calumma parsonii*, *Calumma brevicroene*, *Calumma globifer* and *Calumma nasutum*.

6.3 Parts and derivatives in trade
There is no evidence that chameleon body parts or other derivatives are traded internationally.

6.4 Illegal trade
In a recent survey of chameleon traders in Bangkok TRAFFIC encountered six *Calumma* species from Madagascar on sale but *C. gastrotaenia* was not observed. This survey lasted three weeks and repeat surveys over a longer period are needed to establish whether *C. gastrotaenia* is traded illegally. Other *Calumma* species, including the similar *C. vencesi*, were found for sale in Thailand’s reptile markets.

6.5 Actual or potential trade impacts
Because of the relatively wide geographic range of *C. gastrotaenia*, its local abundance and its tolerance of some habitat disturbance it can probably withstand a modest harvest. Caution is needed however because of the difficulty in distinguishing other members of this species group (Glaw and Vences 2007).

7. Legal instruments
7.1 National
All *Calumma* species from Madagascar were suspended from trade in 1994 (Carpenter et al. 2004, 2005). Madagascar has only been permitted to export four very common species of *Furcifer* chameleons since 1994. There have been no major issues raised by CITES regarding Madagascar’s export of four *Furcifer* species (despite the fact that *Furcifer verrucosus*, *F. pardalis* and *F. lateralis* all have look-a-like congeners that are of conservation concern: *F. nicosiai*, *F. tuzetae* and *F. belalandaensis*) and this suggests that the procedures that are in place for managing this trade in common, unthreatened, species are effective.

7.2 International
This species is not protected internationally, but trade is controlled under the auspices of CITES.

8. Species management
8.1 Management measures
There are no programmes in place in Madagascar to manage *C. gastrotaenia* because exports of this species have been suspended since 1994.

8.2 Population monitoring
There are no programmes in place in Madagascar to monitor *C. gastrotaenia* because exports of this species have been suspended since 1994. Because *C. gastrotaenia* is not a conservation priority it is unlikely that funding will be consistently available to monitor the species.

8.3 Control measures
8.3.1 International
As an Appendix II species exports and imports of *C. gastrotaenia* would be subject to standard CITES procedures and control measures.

8.3.2 Domestic
Annual quotas are produced and assessed by the Scientific Authority for Animals (Department of Animal Biology at the University of Antananarivo).
8.4 Captive breeding and artificial propagation
Whilst *C. gastrotaenia* may be occasionally found in captivity in Madagascar (e.g. Madagascar Exotic), there is no information available that suggests these programmes are linked to supplying the commercial demand or are associated with captive breeding.

8.5 Habitat conservation
Knowledge of the presence of this species in forests that are subject to some form of conservation is incomplete but it is known to occur in Réserve Spéciale d’Ambohitantely, Réserve Spéciale d’Analamazoatra and Parc National de Mantadia (Glaw and Vences 2007).

9. Information on similar species
The *C. gastrotaenia* group of chameleons can be difficult to identify using external characteristics (Glaw and Vences 2007). A number of species in the *C. gastrotaenia* group have restricted ranges and should not be subject to collection from the wild.
We propose two approaches to overcome this challenge:

v. Limit wild collection to the administrative regions of Madagascar where look-a-like species of conservation concern do not occur. The distribution of five potentially confusable species (e.g. *C. marojezense*, *C. peyrierasi*, *C. vatosoa*, *C. vencesi* and *C. guillaumeti*) is allopatric to *C. gastrotaenia*. Collection permits should therefore not be issued for regions in the north or the Vatovavy-Fitovinany Region (where the distribution of *Calumma glawi* overlaps with *C. gastrotaenia*).

vi. Provide training to chameleon exporters and custom officials to include
   a. Identification booklets
   b. Hands-on training with herpetologists

10. Consultations
Prepared by Richard Jenkins and Christian Randrianantoandro

11. References
Proposition pour la réouverture de l’exportation des caméléons collectés dans les milieux sauvages à Madagascar : *Calumma nasutum*

**Contexte**

Étant donné que :
- Les espèces de caméléons Malagasy du genre *Calumma* et *Furcifer* sont inclues dans l’Annexe II et actuellement couverte par la notification 833 (Janvier 1995) ;
- Madagascar a amélioré significativement sa capacité pour l’implémentation de la CITES après la suspension du commerce ;
- Quelques caméléons sont suffisamment abondants pour tolérer une collecte modérée dans le milieu sauvage ;
- Les caméléons sont fortement demandés dans le commerce international des animaux de compagnie ;
- Les caméléons venant de Madagascar sont sujets à une exportation illicite continue ;
- CITES a invité Madagascar à considérer la réouverture du commerce des certaines espèces de caméléon ;
- Il y a un nouveau guidage disponible pour la réalisation des avis de commerce non-préjudiciable (NDF) ;

Les Autorités CITES à Madagascar, en collaboration avec les experts appropriés ont mené les activités suivantes :
- Une réunion a eu lieu à Antananarivo en octobre 2009 pour discuter la lettre provenant du secrétariat CITES (ANNEXE 1) ;
- L’Organe de Gestion (OG) et l’Autorité Scientifique (AS) CITES Madagascar ont demandé Madagasikara Voakajy (www.madagasikara-voakajy.org) de réviser la liste des espèces et les catégories prévisionnels (C1-C4) ;
- Madagasikara Voakajy a soumis le rapport à l’OG et l’AS en janvier 2010 (ANNEXE 2) ;
- L’OG, l’AS et les experts appropriés se sont réunis le 01 février 2010 et ont agréé la liste des espèces dans chaque « C » catégorie (ANNEXE 3) ;
- Un atelier sur les avis de commerce non-préjudiciable (NDF) a eu lieu le 9-10 février 2010 à Antananarivo pour développer le chemin à suivre pour les scientifiques et l’AS à Madagascar pour délivrer NDF (ANNEXE 4) ;
- L’OG, l’AS et experts appropriés se sont réunis le 13 décembre 2010 et ont développé une nouvelle méthode pour le calcul du quota pour les caméléons (ANNEXE 5) ;
- Un comité de rédaction constitué par les représentants de l’OG, l’AS, Madagasikara Voakajy et l’IUCN/SSC Chameleon Specialist Group a été établi pour évaluer le nouvel quota obtenu en utilisant la formule, envers les avis de commerce non-préjudiciable.

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17 AC23 Doc. 8.2
18 AC24 Doc. 7.2
19 SC58 Doc. 21.3 (Rev. 1)
20 AC24 Doc. 9.1 (Reptile and Amphibian Working Group)
Suivant les recommandations du group de travail sur le NDF nous avons mené une évaluation préliminaire du risque. Ceci s’était basé sur les principes que CITES a fourni pour Madagascar en relation avec les caméléons (et les geckos diurnes) et suit la terminologie correspondante :

**Évaluation du risque : Bas (‘C4’ sensu SC58 Doc. 21.3 (Rev. 1))**

Justification brève (voir ‘documents d’appui p. 32-36 pour les détails) :
10. Espèce à large distribution
11. Se trouve dans des habitats fragmentés et perturbés
12. Quelques données sur la densité de la population sont disponibles

**Quota proposé = 2 063**

Ce quota est obtenu selon la procédure suivante :

**Densité de la population :**
La densité moyenne dans treize différentes zones forestières du tableau 1 (Document d’appui)
= 6,6 ha

**Étendue de la Zone d’occurrence :**
La surface de la zone forestière dans les localités où cette espèce a été confirmée présente (en excluant les régions de Diana et Sava)
= 1 563 500 ha

**Taille de la population nationale :**
La population estimée des adultes et juvéniles dans les localités où cette espèce a été confirmée présente :
= densité de la population (6,6) x étendue de la zone d’occurrence (1 563 500) = 10 319 100 individus

**Taille de la population hors aires protégées :**
Du à l’absence d’information précise, nous estimons que 10% de la surface de la zone forestière dans les localités où cette espèce existe, se trouve dans les zones où la collecte est allouée
= population estimée (= 10 319 100 individus) x 0,1
= 1 031 910 individus

**Taille de la population viable :**
A partir de la population viable au dessus, nous estimons de façon prudente que 80% disparus annuellement suite aux causes naturelles et perte en habitat
= population estimée en dehors des aires protégées (1 031 910 individus) x 0,2
= 206 382 individus

**Taille de la population pouvant être collecté :**
De la population à partir de la quelle les collectes peuvent avoir lieu, nous proposons que la collecte de 10% de cette population est apparemment pour être durable
= population viable (206 382) x 0,1
= 20 638 individus

**Quota annuel :**
Nous proposons un quota annuel qui représente le 10% de la potentielle collecte disponible
= population pouvant être collectée (20 638 individus) x 0,1  
= 2 063

Évaluation des Avis de Commerce Préjudiciables
Réflexions en évaluant l’impact potentiel de la collecte de cette espèce :
- Cette espèce a été auparavant jugée capable de tolérer une collecte annuelle modérée ;
- Il y a une quantité rationnelle d’information disponibilité sur la densité de la population ;
- Des difficultés majeur peuvent se rencontrer en distinguant cette espèce de ses congénères;
- *Calumma nasutum* était recensée dans les marchés illégales de reptile en Thaïlande en 2010 ;
- Suite à la suspension en 1994 il y avait une demande élevée en *C. nasutum* ;

Décision et Justification :
Un quota de 2 063 individus serait non- préjudiciable si :
- Aucun permis de collecte n’est délivré pour les Régions de Diana et Sava ;
- Un programme de formation, d'abord aux opérateurs et ensuite au personnel de l’OG qui vérifie les envois, est initié ;
- Le quota est évalué en 2011 après l’atelier sur la Liste Rouge des reptiles Malagasy (24-28 janvier) quand les cartes de distribution mise à jour seront disponibles ;
- L’OG informe l’AS sur le nombre de *C. nasutum* exporté annuellement

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Sahondra Rabesihanaka
Organe de Gestion (Service de la Gestion de la Faune et de la Flore, Ministère de l’Environnement et des Forêts)
Supporting statement: *Calumma nasutum*

1. **TAXONOMY**
   1.1 **Class**
   Reptilia

   1.2 **Order**
   Squamata

   1.3 **Family**
   Chamaeleonidae

   1.4 **Genus, species or subspecies, including author and year**
   *Calumma nasutum* (Duméril & Bibron, 1836)

   1.5 **Scientific synonyms**
   *Calumma nasuta*

   1.6 **Common names (including, where appropriate, trade names)**
   Big-nosed Chameleon

   1.7 **Code numbers**
   If the species concerned is already included in the Appendices, refer to the code numbers in the CITES Identification Manual.
   A-303.005.002.051

2. **SPECIES STATUS**
   2.1 **IUCN Red List Category**
   This species has not yet been evaluated for the IUCN Red List (www.redlist.org accessed 18.09.2010).

   2.2 **National legislation**
   Category I, Class II of (Annexe au décret n°. 2006 - 400 du 13 juin 2006 portant classement des espèces de faune sauvages).

   2.3 **CITES Appendix listing**
   Appendix II (date listed: 04/02/1977), with all *Calumma* species.

3. **SPECIES CHARACTERISTICS**
   3.1 **Distribution**
   This is an endemic Malagasy species that is widespread in forested habitat in the east (Glaw and Vences 2007).

   3.2 **Habitat**
   This species inhabits mid-elevation humid forests (Glaw and Vences 2007) where it occurs in degraded and relatively intact areas (Brady and Griffiths 1999).

   3.3 **Biological characteristics**
   There is little information on the biology of this species. In mid-elevation humid forest population density was higher in the winter than the summer but the opposite was found in low elevation forest elsewhere (Brady and Griffiths 1999; Rabearivony et al. 2008).
3.4 Morphological characteristics
A small brown chameleon with a large nose, reaching a maximum of 108 mm in total length (Glaw and Vences 2007). The rostral appendage is present in both sexes and the males have a dorsal crest (Glaw and Vences 2007).

3.5 Role of the species in its ecosystem
The ecological role of chameleons is poorly known in Madagascar. Most species however feed on invertebrates. There is unlikely to be a significant impact on the ecosystem from removing small numbers of *C. nasutum*.

4. STATUS AND TRENDS
4.1 Habitat trends
The deforestation rate in Madagascar’s humid forests was calculated at 0.8% between 1990 and 2000 (Harper et al. 2008) and 0.23% between 2000 and 2005 (MEFT et al. 2009). The amount and quality of habitat for this species is declining. Humid forest is subject to different threats, including selective logging, bushfires and clearance for agriculture.

4.2 Population size
Brady and Griffiths (1999) estimated a total population size between 1,209,240 and 178,967,520 individuals. The population density of this species has been calculated from a number of different sites in Madagascar (Table 1).

Table 1. The population density of *C. nasutum* from different sites in Madagascar

<table>
<thead>
<tr>
<th>Site</th>
<th>Season</th>
<th>Density (ha⁻¹)</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Réserve Spéciale d’Analamazoatra</td>
<td>Summer</td>
<td>1.6 (0.7 SE)</td>
<td>Brady &amp; Griffiths 1999</td>
</tr>
<tr>
<td>Parc National de Mantadia (Sahanody)</td>
<td>Summer</td>
<td>0.3 (0.2 SE)</td>
<td>Brady &amp; Griffiths 1999</td>
</tr>
<tr>
<td>Parc National de Mantadia (Andranomananamponga)</td>
<td>Summer</td>
<td>2.9 (0.9 SE)</td>
<td>Brady &amp; Griffiths 1999</td>
</tr>
<tr>
<td>Vohimana (Sity) Forest</td>
<td>Summer</td>
<td>3.5 (1.1 SE)</td>
<td>Brady &amp; Griffiths 1999</td>
</tr>
<tr>
<td>Maromizaha Forest</td>
<td>Summer</td>
<td>1.1 (1.1 SE)</td>
<td>Brady &amp; Griffiths 1999</td>
</tr>
<tr>
<td>Parc National de Mantadia (Mahanara)</td>
<td>Summer</td>
<td>5.1 (1.9 SE)</td>
<td>Brady &amp; Griffiths 1999</td>
</tr>
<tr>
<td>Station Forestière d’Analamazoatra</td>
<td>Summer</td>
<td>6.8 (2.6 SE)</td>
<td>Brady &amp; Griffiths 1999</td>
</tr>
<tr>
<td>Analamazoatra Periphery</td>
<td>Summer</td>
<td>8.6 (3.2 SE)</td>
<td>Brady &amp; Griffiths 1999</td>
</tr>
<tr>
<td>Parc National de Ranomafana</td>
<td>Summer</td>
<td>6.2</td>
<td>Brady &amp; Griffiths 1999</td>
</tr>
<tr>
<td>Parc National de Ranomafana</td>
<td>Winter</td>
<td>33.4</td>
<td>Brady &amp; Griffiths 1999</td>
</tr>
<tr>
<td>Ambodiriana Forest</td>
<td>Summer</td>
<td>4.2 (38.6 CV)</td>
<td>Rabeaivony et al. 2008</td>
</tr>
<tr>
<td>Andranomay Forest (intact)</td>
<td>Summer</td>
<td>7.6 (38.7 CV)</td>
<td>Jenkins et al. 2003</td>
</tr>
<tr>
<td>Andranomay Forest (disturbed)</td>
<td>Summer</td>
<td>5.4 (31.4 CV)</td>
<td>Jenkins et al. 2003</td>
</tr>
</tbody>
</table>

4.3 Population structure
There are few reliable published data on the population structure of this species. In Ambodiriana forest, male to female ratio was 0.25 to 0.75 in the winter and 0.40 to 0.60 in the summer (Rabeaivony et al. 2008). Adults and juveniles present in both the summer and winter but hatchlings were only observed in the summer (Rabeaivony et al. 2008).

4.4 Population trends
There is no information available on the population trends of *C. nasutum*.

4.5 Geographic trends
There is no information available on the population trends of *C. nasutum*. 
5. Threats

5.1 Nature
*Calumma nasutum* inhabits mid-elevation and lowland humid forest and although it appears to be tolerant of some levels of habitat degradation it nevertheless appears to require relatively intact forest for survival (Brady and Griffiths 2009; Glaw and Vences 2007). Mid-elevation and lowland humid forest in Madagascar is subject to a range of threats both inside and outside protected areas. A rapidly growing human population with a widespread dependence on subsistence agriculture and fuel wood cutting makes deforestation in Madagascar difficult to slow. The use of fire in zebu cattle grazing and slash-and-burn agriculture are major contributors to the decline in forest area and quality (Harper et al. 2007). The extractive industry, including minerals, gems and timber, also contribute to deforestation.

5.2 Intensity
There is little available information on the intensity of the threats although there are lower deforestation rates in the strict protected parks than unprotected areas of eastern Madagascar.

5.3 Relative importance of any human-induced threats
All of the threats to this species are human-induced.

6. Utilization and Trade

6.1 National utilization
A few animal parks in Madagascar keep chameleons are these are usually species larger than *C. nasutum*. Exports of this species from Madagascar were suspended by CITES in 1994 so there is currently minimal utilization of *C. nasutum* at the national level (Carpenter et al. 2004, 2005).

6.2 Legal trade
Information accessed from the CITES/WCMC Trade Database shows that *C. nasutum* represented 4.7% of the 27,261 individual chameleons imported from Madagascar in the period between 1978 and 2008. From the 1,263 live *C. nasutum* exported from Madagascar for commercial purposes, all were from the period between 1987 and 1995. Thus, prior to the 1994 trade suspension for all *Calumma* exported from Madagascar *C. gastrotaenia* was subject to relatively high commercial demand but lower than *Calumma parsonii*, *Calumma brevicorne* and *Calumma globifer*.

6.3 Parts and derivatives in trade
There is no evidence that chameleon body parts or other derivatives are traded internationally.

6.4 Illegal trade
In a recent survey of chameleon traders in Bangkok TRAFFIC encountered six *Calumma* species from Madagascar including two *C. nasutum*. This survey lasted three weeks and repeat surveys over a longer period are needed to establish the extent of the illegal trade in this species.

6.5 Actual or potential trade impacts
Because of the relatively wide geographic range of *C. nasutum*, its local abundance and its tolerance of some habitat disturbance it can probably withstand a modest harvest. Caution is needed however because of the difficulty in distinguishing other members of this species group (Glaw and Vences 2007).

7. Legal Instruments

7.1 National
All *Calumma* species from Madagascar were suspended from trade in 1994 (Carpenter et al. 2004, 2005). Madagascar has only been permitted to export four very common species of *Furcifer* chameleons since 1994. There have been no major issues raised by CITES regarding Madagascar’s export of four *Furcifer* species (despite the fact that *Furcifer verrucosus*, *F. pardalis* and *F. lateralis* all have look-a-like congeners that are of conservation concern: *F. nicosiai*, *F. tuzetae* and *F.
belalandaensis) and this suggests that the procedures that are in place for managing this trade in common, unthreatened, species are effective.

7.2 International
This species is not protected internationally, but trade is controlled under the auspices of CITES.

8. Species Management
8.1 Management measures
There are no programmes in place in Madagascar to manage C. nasutum because exports of this species have been suspended since 1994.

8.2 Population monitoring
There are no programmes in place in Madagascar to monitor C. nasutum because exports of this species have been suspended since 1994. Because C. nasutum is not a conservation priority it is unlikely that funding will be consistently available to monitor the species.

8.3 Control measures
8.3.1 International
As an Appendix II species exports and imports of C. nasutum would be subject to standard CITES procedures and control measures.

8.3.2 Domestic
Annual quotas are produced and assessed by the Scientific Authority for Animals (Department of Animal Biology at the University of Antananarivo).

8.4 Captive breeding and artificial propagation
Whilst C. nasutum may be occasionally found in captivity in Madagascar (e.g. Madagascar Exotic), there is no information available that suggests these programme are linked to supplying the commercial demand or are associated with captive breeding.

8.5 Habitat conservation
Knowledge of the presence of this species in forests that are subject to some form of conservation is incomplete but it is known to occur in Réserve Spéciale d’Anjanaharibe-Sud, Analamazoatra and Parc National de Mantadia, Parc National d’Andohahela, Parc National d’Andringitra, Parc National de Marojejy, Parc National de Montagne d’Ambre, Parc National de Ranomafana and Parc National de Zahamena (Glaw and Vences 2007).

9. Information on similar species
The C. nasutum group of chameleons can be difficult to identify using external characteristics (Glaw and Vences 2007). A number of species in the C. nasutum group have restricted ranges and should not be subject to collection from the wild.

We propose two approaches to overcome this challenge:

vii. Limit wild collection to the administrative regions of Madagascar where look-a-like species of conservation concern do not occur i.e. avoid collection in the north where C. boettgeri, C. guibei and C. gallus occur;

viii. Provide training to chameleon exporters and custom officials to include
a. Identification booklets
b. Hands-on training with herpetologists

10. Consultations
Prepared by Richard Jenkins and Christian Randrianantoandro
11. References
Proposition pour la réouverture de l’exportation des caméléons collectés dans les milieux sauvages à Madagascar : *Calumma parsonii*

**Contexte**

Étant donné que :
- Les espèces de caméléons Malagasy du genre *Calumma* et *Furcifer* sont inclues dans l’Annexe II et actuellement couverte par la notification 833 (Janvier 1995) ;
- Madagascar a amélioré significativement sa capacité pour l’implémentation de la CITES \(^{21}\) après la suspension du commerce ;
- Quelques caméléons sont suffisamment abondants pour tolérer une collecte modérée dans le milieu sauvage \(^{22}\) ;
- Les caméléons sont fortement demandés dans le commerce international des animaux de compagnie ;
- Les caméléons venant de Madagascar sont sujets à une exportation illicite continue ;
- CITES a invité Madagascar à considérer la réouverture du commerce des certaines espèces de caméléon \(^{23}\) ;
- Il y a un nouveau guidage disponible pour la réalisation des avis de commerce non-préjudiciable (NDF) \(^{24}\) ;

Les Autorités CITES à Madagascar, en collaboration avec les experts appropriés ont mené les activités suivantes :
- Une réunion a eu lieu à Antananarivo en octobre 2009 pour discuter la lettre provenant du secrétariat CITES (ANNEXE 1) ;
- L’Organe de Gestion (OG) et l’Autorité Scientifique (AS) CITES Madagascar ont demandé Madagasikara Voakajy (www.madagasikara-voakajy.org) de réviser la liste des espèces et les catégories prévisionnels (C1-C4) ;
- Madagasikara Voakajy a soumis le rapport à l’OG et l’AS en janvier 2010 (ANNEXE 2) ;
- L’OG, l’AS et les experts appropriés se sont réunis le 01 février 2010 et ont agréé la liste des espèces dans chaque « C » catégorie (ANNEXE 3) ;
- Un atelier sur les avis de commerce non-préjudiciable (NDF) a eu lieu le 9-10 février 2010 à Antananarivo pour développer le chemin à suivre pour les scientifiques et l’AS à Madagascar pour délivrer NDF (ANNEXE 4) ;
- L’OG, l’AS et experts appropriés se sont réunis le 13 décembre 2010 et ont développé une nouvelle méthode pour le calcul du quota pour les caméléons (ANNEXE 5) ;
- Un comité de rédaction constitué par les représentants de l’OG, l’AS, Madagasikara Voakajy et l’IUCN/SSC Chameleon Specialist Group a été établi pour évaluer le nouvel quota obtenu en utilisant la formule, envers les avis de commerce non-préjudiciable.

\(^{21}\) AC23 Doc. 8.2
\(^{22}\) AC24 Doc. 7.2
\(^{23}\) SC58 Doc. 21.3 (Rev. 1)
\(^{24}\) AC24 Doc. 9.1 (Reptile and Amphibian Working Group)
**Calumma parsonii**  
*Quota = 176*

Suivant les recommandations du groupe de travail sur le NDF nous avons mené une évaluation préliminaire du risque. Ceci s’était basé sur les principes que CITES a fourni pour Madagascar en relation avec les caméléons (et les geckos diurnes) et suit la terminologie correspondante :  

Évaluation du risque : Moyen (‘C3 *sensu* SC58 Doc. 21.3 (Rev. 1))

Justification brève (voir documents d’appuis p. 40-44 pour les détails) :
- Espèce à large distribution but low population densities
- Peu d’informations sur l’histoire naturelle de cette espèce mais elle semble avoir des densités faibles et a une croissance relativement faible
- Habite dans la forêt humide qui est sous pression, elle est plus abondante dans la forêt relativement intacte
- Elle semble avoir une distribution large mais a été confirmée seulement dans quelques différents sites
- Quelques données sur la densité de la population sont disponibles

Quota proposé = 176

Ce quota est obtenu selon la procédure suivante :

**Densité de la population :**
La valeur moyenne des cinq séries de densité estimée est entre 0,4 ha$^{-1}$ et 3,9 ha$^{-1}$ pour *C. parsonii cristifer* (Brady & Griffiths 1999)  
= 1,3 ha$^{-1}$

**Zone d’occurrence :**
La surface de forêt dans les localités où l’existence de cette espèce a été confirmée  
= 677 500 ha

**Taille de la population nationale :**
La population estimée des adultes et juvéniles dans la localité où l’existence de cette espèce existe :  
= densité de la population (1,3) x zone d’occurrence (677 500)  
= 880 750 individus

**Taille de la population hors aires protégées :**
Dans l’absence d’information précise, nous estimons que 10% de la surface de forêt dans les localités où cette espèce existe se trouve dans les zones où la collecte est autorisée  
= population estimée (880 750 individus) x 0,1  
= 88 075 individus

**Taille de la population viable :**
A partir de la population viable au dessus, nous estimons de façon prudente que 80% sont disparus annuellement suite aux causes naturelles et perte en habitat  
= population estimée en dehors des aires protégées (88 075 individus) x 0,2  
= 17 615 individus :

**Taille de la population pouvant être collecté :**
De la population à partir de la quelle les collectes peuvent avoir lieu, nous proposons que la collecte de 10% de cette population est apparemment pour être durable  
= population viable x 0,1  
= 1 762 individus
**Quota Annuel :**
Nous proposons un quota annuel qui représente le 10% de la population pouvant être collectée
= population pouvant être collectée (1 762 individus) x 0,1
= 176

**Évaluation des Avis de Commerce Préjudiciables**
Réflexions en évaluant l’impact potentiel de la collecte de cette espèce :
- Cette espèce peut prendre un temps beaucoup plus long pour atteindre la maturité sexuelle par rapport aux autres caméléons Malagasy ;
- La densité des adultes de grande taille est basse ;
- La densité de la population est disponible pour quelques sites mais a été collecté dix ans passés ;
- Cette espèce est apparemment en forte demande dans le commerce ;

**Décision et Justification :**
Un quota de 176 individus serait non-préjudiciable si :
- La collecte est réservée aux individus présentant une longueur du museau au cloaque moins de 100 mm (basée sur les discussions par email avec le Professeur Miguel Vences et Dr. Frank Glaw) ;
- La collecte est effectuée dans différentes régions administrative pour éviter l’exploitation excessive dans quelques sites ;
- Un programme de formation, d'abord aux opérateurs et ensuite au personnel de l’OG qui vérifie les envois, est initié ;
- L’OG informe l’AS sur le nombre de C. nasutum exporté annuellement
- Recherche scientifique sur la densité et la structure de la population est menée au moins dans un site de collecte ;
- Le quota est évalué en 2011 après l’atelier sur la Liste Rouge des reptiles Malagasy (24-28 janvier) quand les cartes de distribution mise à jour seront disponibles.

**Préparé par**
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Supporting statement: *Calumma parsonii*

1. **TAXONOMY**
   1.1 Class
   Reptilia

   1.2 Order
   Squamata

   1.3 Family
   Chamaeleonidae

   1.4 Genus, species or subspecies, including author and year
   *Calumma parsonii* (Cuvier, 1824)

   1.5 Scientific synonyms
   *Chamaeleo madecasseus*
   *Chamaeleo parsonii*

   1.6 Common names (including, where appropriate, trade names)
   Parson’s Chameleon

   1.7 Code numbers
   If the species concerned is already included in the Appendices, refer to the code numbers in the CITES Identification Manual.

   A-303.005.002.056

2. **SPECIES STATUS**
   2.1 IUCN Red List Category
   This species has not yet been evaluated for the IUCN Red List (www.redlist.org accessed 18.09.2010).

   2.2 National legislation
   Category I, Class II (listed as *Calumma brevicornis*) of (Annexe au décret n°. 2006 - 400 du 13 juin 2006 portant classement des espèces de faune sauvages).

   2.3 CITES Appendix listing
   Appendix II (date listed: 04/02/1977)

3. **SPECIES CHARACTERISTICS**
   3.1 Distribution
   This large chameleon species is endemic to Madagascar where it is found in the humid eastern part of the island, from Ranomafana in the south to Anjanaharibé Sud in the north (Rakotomalala & Raselimanana 2003). It has been reported from elevations between 45 m (Rabearivony et al. 2008) and 1600 m (Rakotomalala and Raselimanana 2003).

   3.2 Habitat
   This species inhabits mid and low elevation humid forests (Glaw and Vences 2007). Brady and Griffiths (1999) estimated 17,844 km² and 20,714 km² of lowland and mid altitude forest was remaining within the likely range of *C. parsonii*. Glaw and Vences (2007) reported that this species is frequently seen along forest streams, although Brady and Griffiths (1999) suggest that only hatchlings are associated with water.
3.3 Biological characteristics
Predators of *C. parsonii* include the snakes *Brygophis coulangesi* and *Madagascarophis colubrinus* (Glaw and Vences 2007). In captivity, 20-30 eggs are buried and hatch after 400-520 days. This species might be very long lived for chameleons, with ages of six years recorded and 10-12 expected. Sexual maturity may be reached as early as 1.5 years (LeBerre 1995) but Brady and Griffiths (1999) noted reports from captive chameleons that three to five is more likely.

3.4 Morphological characteristics
Adult *C. parsonii* are large, reaching 295 mm snout vent and 695 mm total length (Glaw and Vences 2007). The male has an distinct rostral crest and two large rostral appendages. Several different color morphs exist for males. Color varies between blue, green and yellow.

3.5 Role of the species in its ecosystem
The ecological role of chameleons is poorly known in Madagascar. Most species however feed on invertebrates. There is unlikely to be a significant impact on the ecosystem from removing small numbers of *C. parsonii*.

4. STATUS AND TRENDS
4.1 Habitat trends
The deforestation rate in Madagascar’s humid forests was calculated at 0.8% between 1990 and 2000 (Harper et al. 2007) and 0.23% between 2000 and 2005 (MEFT et al. 2009). The amount and quality of habitat for this species is declining. Humid forest is subject to different threats, including selective logging, bushfires and clearance for agriculture.

4.2 Population size
Brady and Griffiths (1999) reported densities of between 1.3 and 3.9 chameleons ha$^{-1}$ in relatively intact forest at Mantadia with lower densities (0.1 – 0.4 ha$^{-1}$) in more disturbed forest. Population densities are consistently lower than other *Calumma* species (Brady and Griffiths 1999) although this might be because *C. parsonii* roosts in elevated locations in the canopy out of reach of nocturnal surveys by torch light.

4.3 Population structure
There is no information available on the population structure of *C. parsonii*.

4.4 Population trends
There is no information available on the population trends of *C. parsonii*.

4.5 Geographic trends
There is no information available on the population trends of *C. parsonii* but it is almost certainly declining in range because of habitat loss.

5. THREATS
5.1 Nature
Humid forest in Madagascar is subject to a range of threats both inside and outside protected areas. A rapidly growing human population with a widespread dependence on subsistence agriculture and fuel wood cutting makes deforestation in Madagascar difficult to slow. The use of fire in zebu cattle grazing and slash-and-burn agriculture are major contributors to the decline in forest area and quality (Harper et al. 2007). The extractive industry, including minerals, gems and timber, also contribute to deforestation.

5.2 Intensity
The extent to which this species requires intact humid forest remains unresolved with evidence suggesting that it is more abundant in less disturbed forest (Brady and Griffiths 1999; Raxworthy 1988) but that it is also found in disturbed sites (Brady and Griffiths 1999; Glaw & Vences 2007).
5.3 Relative importance of any human-induced threats
All of the threats to this species are human-induced and habitat loss is the most important.

6. UTILIZATION AND TRADE
6.1 National utilization
A few animal parks in Madagascar keep chameleons are these include C. parsonii. Exports of this species from Madagascar were suspended by CITES in 1994 so there is minimal utilization of C. brevicorne at the national level (Carpenter et al. 2004, 2005).

6.2 Legal trade
Information accessed from the CITES/WCMC Trade Database database shows that C. parsonii represented 52% of the 27,261 individual chameleons imported from Madagascar in the period between 1978 and 2008. Thus, prior to the 1994 trade suspension for all Calumma exported from Madagascar C. parsonii was traded in quantities higher than any other chameleon species.

6.3 Parts and derivatives in trade
There is no evidence that chameleon body parts or other derivatives are traded internationally.

6.4 Illegal trade
In a recent survey of chameleon traders in Bangkok TRAFFIC encountered six Calumma species from Madagascar and C. parsonii represented 24% of the 115 animals encountered.

6.5 Actual or potential trade impacts
Because of the wide geographic range C. parsonii should, in theory, be able to withstand commercial collection. The main concern is that localized collection levels might be unsustainable because the species occurs at low densities and is slow growing. Research is needed on the reproductive biology of this species so that sensible body-size restrictions can be placed on the harvest.

7. LEGAL INSTRUMENTS
7.1 National
All Calumma species from Madagascar were suspended from trade in 1994 (Carpenter et al. 2004, 2005). Indeed, Madagascar has only been permitted to export four very common species of Furcifer chameleons since 1994. Existing legislation permits the collection of C. parsonii providing the CITES Management and Scientific authorities provide authorization.

7.2 International
This species is not protected internationally, but trade is controlled under the auspices of CITES.

8. SPECIES MANAGEMENT
8.1 Management measures
There are no programmes in place in Madagascar to manage C. parsonii because exports of this species have been suspended since 1994.

8.2 Population monitoring
There are no programmes in place in Madagascar to manage C. parsonii because exports of this species have been suspended since 1994.

8.3 Control measures
8.3.1 International
As an Appendix II species exports and imports of C. parsonii will be subject to standard CITES procedures.

8.3.2 Domestic
Harvest quotas are produced and assessed by the Scientific Authority for Animals (Department of Animal Biology at the University of Antananarivo).
8.4 Captive breeding and artificial propagation
Whilst *C. parsonii* is found in captivity in Madagascar (e.g. Madagascar Exotic, Parc Botanique et Zoologique de Tsingy), there is no information available that suggests these programmes are linked to supplying the commercial demand or are associated with commercial captive breeding.

8.5 Habitat conservation
Knowledge of the presence of this species in forests that are subject to some form of conservation is incomplete but it is known to occur in Réserve Spéciale d’Analamazoatra, Réserve Spéciale d’Anjanaharibe Sud and Parc National de Mantadia (Glaw and Vences 2007).

9. Information on similar species
Adult *Calumma parsonii* are quite distinctive but juveniles could be confused with *Calumma globifer* and *Calumma oshaughnessyi*:

- Provide training to chameleon exporters and custom officials to include
- Identification booklets
- Hands-on training with herpetologists

10. Consultations
Prepared by Richard Jenkins and Christian Randrianantoandro

11. References


Proposition pour la réouverture de l’exportation des caméléons collectés dans les milieux sauvages à Madagascar : *Furcifer antimena*

**Contexte**

Étant donné que :
- Les espèces de caméléons Malagasy du genre *Calumma* et *Furcifer* sont inclues dans l’Annexe II et actuellement couvertes par la notification 833 (Janvier 1995) ;
- Madagascar a amélioré significativement sa capacité pour l’implémentation de la CITES après la suspension du commerce ;
- Quelques caméléons sont suffisamment abondants pour tolérer une collecte modérée dans le milieu sauvage ;
- Les caméléons sont fortement demandés dans le commerce international des animaux de compagnie ;
- Les caméléons venant de Madagascar sont sujets à une exportation illicite continue ;
- CITES a invité Madagascar à considérer la réouverture du commerce des certaines espèces de caméléon ;
- Il y a un nouveau guidage disponible pour la réalisation des avis de commerce non préjudiciable (NDF) ;

Les Autorités CITES à Madagascar, en collaboration avec les experts appropriés ont mené les activités suivantes :
- Une réunion a eu lieu à Antananarivo en octobre 2009 pour discuter la lettre provenant du secrétariat CITES (ANNEXE 1) ;
- L’Organe de Gestion (OG) et l’Autorité Scientifique (AS) CITES Madagascar ont demandé Madagasikara Voakajy (www.madagasikara-voakajy.org) de réviser la liste des espèces et les catégories prévisionnels (C1-C4) ;
- Madagasikara Voakajy a soumis le rapport à l’OG et l’AS en janvier 2010 (ANNEXE 2) ;
- L’OG, l’AS et les experts appropriés se sont réunis le 01 février 2010 et ont agréé la liste des espèces dans chaque « C » catégorie (ANNEXE 3) ;
- Un atelier sur les avis de commerce non-préjudiciable (NDF) a eu lieu le 9-10 février 2010 à Antananarivo pour développer le chemin à suivre pour les scientifiques et l’AS à Madagascar pour délivrer NDF (ANNEXE 4) ;
- L’OG, l’AS et experts appropriés se sont réunis le 13 décembre 2010 et ont développé une nouvelle méthode pour le calcul du quota pour les caméléons (ANNEXE 5) ;
- Un comité de rédaction constitué par les représentants de l’OG, l’AS, Madagasikara Voakajy et l’IUCN/SSC Chameleon Specialist Group a été établi pour évaluer le nouvel quota obtenu en utilisant la formule, envers les avis de commerce non-préjudiciable.

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25 AC23 Doc. 8.2
26 AC24 Doc. 7.2
27 SC58 Doc. 21.3 (Rev. 1)
28 AC24 Doc. 9.1 (Reptile and Amphibian Working Group)
Suivant les recommandations du groupe de travail sur le NDF nous avons mené une évaluation préliminaire du risque\textsuperscript{29}. Ceci s’était basé sur les principes que CITES a fourni pour Madagascar en relation avec les caméléons (et les geckos diurnes) et suit la terminologie suivante\textsuperscript{30} :

Évaluation du risque : Moyen (‘C3’ sensu SC58 Doc. 21.3 (Rev. 1))

Justification brève (voir documents d’appuis p. 48-51 pour les détails) :
- Espèce à distribution restreinte
- Se trouve dans les forêts épineuses
- Quelques données sur la densité de la population sont disponibles
- Pas de données publiées sur la reproduction et les tendances de la population

Quota proposé =

Ce quota est obtenu selon la procédure suivante :

Densité de la population :
Nous avons utilisé la limite inférieure de l’intervalle de confiance à 95 % basée sur la seule densité estimée publiée sur cette espèce (Karsten et al. 2010) :
\[= 9,3 \text{ ha}^{-1}\]

Étendue de la Zone d’occurrence :
La surface de la zone forestière dans les localités où cette espèce a été confirmée présente (en excluant l’aire protégée Mikea) :
\[= 408 300 \text{ ha}\]

Taille de la population nationale :
La population estimée des adultes et juvéniles dans les localités où cette espèce a été confirmée présente :
\[= \text{densité de la population (9,3) x étendue de la zone d’occurrence (408 300)}\]
\[= 3 797 190 \text{ individus}\]

Taille de la population hors aires protégées :
Du à l’absence d’information précise, nous estimons que 10% de la surface de la zone forestière dans les localités où cette espèce existe, se trouve dans les zones où la collecte est allouée :
\[= \text{population estimée (3 797 190 individus) x 0,1}\]
\[= 379 719 \text{ individus}\]

Taille de la population viable :
A partir de la population viable au dessus, nous estimons de façon prudente que 80% disparus annuellement suite aux causes naturelles et perte en habitat :
\[= \text{population estimée en dehors des aires protégées (379 719 individus) x 0,2}\]

\textsuperscript{29}AC24 Doc. 9.1 (Reptile and Amphibian Working Group)
\textsuperscript{30}AC24 Doc. 7.2
Taille de la population pouvant être collecté :
De la population à partir de laquelle les collectes peuvent avoir lieu, nous proposons que la collecte de 10% de cette population est apparemment pour être durable
= population viable (75 943) x 0,1
= 7 594 individus

Quota annuel :
Nous proposons un quota annuel qui représente le 10% de la potentielle collecte disponible
= population pouvant être collectée (7 594 individus) x 0,1
= 759

Évaluation des Avis de Commerce Préjudiciables
Réflexions en évaluant l’impact potentiel de la collecte de cette espèce :
- Espèce à distribution restreinte endémique à un type d’habitat en déclin dans le sud-ouest ;
- La seule estimation de la densité publiée est basée sur un très faible nombre d’échantillon (n = 22) ;
- Il était recommandé à la CITES qu’un « petit » quota d’exportation pourrait être durable pour cette espèce 7 ;
- Cette espèce a une distribution en déclin à cause de la perte en habitat ;
- Pas d’information dans l’histoire naturelle ou la biologie de la reproduction pour cette espèce ;
- Il y a quelques doutes à propos de l’étendue actuelle de son zone d’occurrence :
- Pour une espèce à « risque moyenne », le monitoring de la population est nécessaire dans les sites de collecte

Décision et Justification :
Il y a une manque de preuves pour confirmer si un quota de 759 serait non-préjudiciable

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Organe de Gestion (Service de la Gestion de la Faune et de la Flore, Ministère de l’Environnement et des Forêts)
Supporting statement: *Furcifer antimena*

1. **TAXONOMY**
   
1.1 **Class**
   Reptilia

1.2 **Order**
   Squamata

1.3 **Family**
   Chamaeleonidae

1.4 **Genus, species or subspecies, including author and year**
   *Furcifer antimena* (Grandidier, 1872)

1.5 **Scientific synonyms**
   *Chamaeleo antimena, Chamaeleon rhinoceratus lineatus*

1.6 **Common names (including, where appropriate, trade names)**
   White-lined Chameleon

1.7 **Code numbers**
   If the species concerned is already included in the Appendices, refer to the code numbers in the CITES Identification Manual.

   A-303.005.002.006

2. **SPECIES STATUS**
   
2.1 **IUCN Red List Category**
   Not evaluated.

2.2 **National legislation**
   Category I, Class II of (Annexe au décret n°. 2006 - 400 du 13 juin 2006 portant classement des espèces de faune sauvages).

2.3 **CITES Appendix listing**
   Appendix II (date listed: 04/02/1977)

3. **SPECIES CHARACTERISTICS**
   
3.1 **Distribution**
   *Furcifer antimena* is restricted to the south-west of Madagascar at elevations between 5 m and 80 m above sea-level (Raselimanana and Rakotomalala 2003; Raselimanana 2004). The most easterly known location is around Antsokay and the airstrip at Toliara (Brygoo 1971) and the most northerly at Ankotapiky, near Morombe (Raselimanana 2004). It appears therefore that the Onilahy and Mangoky Rivers are the boundary to the geographic range of *F. antimena* (Brygoo 1971).

3.2 **Habitat**
   It is considered a forest species by Raselimanana and Rakotomalala (2003) and is known to occur in both relatively intact and degraded areas (Raselimanana 2004). It is restricted to spiny forest vegetation.

3.3 **Biological characteristics**
   Karsten et al. (2010) consider *F. antimena* to be susceptible to habitat disturbance. Egg laying in the wild was reported in April (Glaw and Vences 2007).
3.4 Morphological characteristics
This chameleon can attain snout-vent lengths of 170 mm. A single, rostral appendage present in both species, but longer in males (9-12 mm) than in females (2-3.5 mm). Both sexes can be green or brown; females have a white mid-ventral line and males have a distinct white-grey lateral band (Glaw and Vences 2007).

3.5 Role of the species in its ecosystem
The ecological role of chameleons is poorly known in Madagascar. Most species however feed on invertebrates. There is unlikely to be a significant impact on the ecosystem from removing small numbers of *F. antimena*.

4. STATUS AND TRENDS
4.1 Habitat trends
Spiny forest is one of the most threatened habitat types in Madagascar. In a recent assessment deforestation levels were consistently high in this habitat and rates were higher in the nineties compared to previous decades (Harper et al. 2007). The area around the city of Toliara, which comprises the southern limit of the range of *F. antimena*, has suffered particularly high rates of deforestation (Harper et al. 2007).

4.2 Population size
There is little information on the size of the *F. antimena* population with only a single published account of its density (Karsten et al. 2010). Using a sample of 22 observations from Belalanda Karsten et al. (2010) calculated the population density of *F. antimena* in the easily dry season to be 17.0 ha⁻¹ (95% CI 9.3 - 30.9 ha⁻¹).

4.3 Population structure
There are no available published data on the population structure of this species.

4.4 Population trends
There is no available published information on the population trends of this species.

4.5 Geographic trends
There has been a reported decline in the distribution of this species (Karsten et al. 2010) in the areas to the north of the city of Toliara.

5. THREATS
5.1 Nature
The loss of spiny forest is the main threat to *F. antimena* (Karsten et al. 2010).

5.2 Intensity
There is little available information on the intensity of the threats.

5.3 Relative importance of any human-induced threats
All of the threats to this species are human-induced.

6. UTILIZATION AND TRADE
6.1 National utilization
Exports of this species from Madagascar were suspended by CITES in 1994 so there is minimal utilization of *F. antimena* at the national level (Carpenter et al. 2004, 2005).

6.2 Legal trade
Information accessed from the CITES/WCMC Trade Database database shows that *F. antimena* represented 9% of the 25,640 individual *Furcifer* chameleons exported from Madagascar in the period...
between 1978 and 2008. Thus, prior to the 1994 trade suspension *F. antimena* was subject to moderate commercial demand.

6.3 Parts and derivatives in trade
There is no evidence that chameleon body parts or other derivatives are traded internationally.

6.4 Illegal trade
In a recent survey of chameleon traders in Bangkok TRAFFIC encountered eight *Furcifer* species from Madagascar on sale and although no *F. antimena* were observed, the second most frequently encountered species was *F. labordi* which strongly resembles *F. antimena*.

6.5 Actual or potential trade impacts
Whilst a small annual harvest is unlikely to threaten *F. antimena* it should be noted that there are major gaps in knowledge surrounding its biology.

7. LEGAL INSTRUMENTS
7.1 National
All but four *Furcifer* species from Madagascar were suspended from trade in 1994 (Carpenter et al. 2004, 2005). Existing legislation permits the collection of *F. antimena* subject to authorization from the CITES Management and Scientific authorities.

7.2 International
This species is not protected internationally, but trade is controlled under the auspices of CITES.

8. SPECIES MANAGEMENT
8.1 Management measures
There are no programmes in place in Madagascar to manage *F. antimena* because exports of this species have been suspended since 1994. The traditional site for commercial collection of this species, at Itremo, is currently being designated a new protected area.

8.2 Population monitoring
There are no programmes in place to monitor this species.

8.3 Control measures
8.3.1 International
As an Appendix II species exports and imports of *F. minor* will be subject to standard CITES procedures.

8.3.2 Domestic
Harvest quotas are produced and assessed by the Scientific Authority for Animals (Department of Animal Biology at the University of Antananarivo).

8.4 Captive breeding and artificial propagation
There are no reports of this species in captivity.

8.5 Habitat conservation
The spiny forests in south-western Madagascar are being protected in a project led by WWF and Madagascar National Parks. A relatively large proportion of the remaining habitat of this species is therefore subject to some form of conservation.

9. Information on similar species
This species can be confused with other species (e.g. female *F. labordi*) and *F. petteri*.

We propose to provide training to chameleon exporters and custom officials to include:
- Identification booklets
- Hands-on training with herpetologists

10. Consultations
Prepared by Richard Jenkins and Christian Randrianantoandro

11. References
Proposition pour la réouverture de l’exportation des caméléons collectés dans les milieux sauvages à Madagascar : *Furcifer campani*

Contexte

Étant donné que :
- Les espèces de caméléons Malagasy du genre *Calumma* et *Furcifer* sont incluses dans l’Annexe II et actuellement couverte par la notification 833 (Janvier 1995) ;
- Madagascar a amélioré significativement sa capacité pour l’implémentation de la CITES31 après la suspension du commerce ;
- Quelques caméléons sont suffisamment abondants pour tolérer une collecte modérée dans le milieu sauvage32 ;
- Les caméléons sont fortement demandés dans le commerce international des animaux de compagnie ;
- Les caméléons venant de Madagascar sont sujets à une exportation illicite continue ;
- CITES a invité Madagascar à considérer la réouverture du commerce des certaines espèces de caméléon33 ;
- Il y a un nouveau guidage disponible pour la réalisation des avis de commerce non-préjudiciable (NDF)34 ;

Les Autorités CITES à Madagascar, en collaboration avec les experts appropriés ont mené les activités suivantes :
- Une réunion a eu lieu à Antananarivo en octobre 2009 pour discuter la lettre provenant du secrétariat CITES (ANNEXE 1) ;
- L’Organe de Gestion (OG) et l’Autorité Scientifique (AS) CITES Madagascar ont demandé Madagasikara Voakajy (www.madagasikara-voakajy.org) de réviser la liste des espèces et les catégories prévisionnels (C1-C4) ;
- Madagasikara Voakajy a soumis le rapport à l’OG et l’AS en janvier 2010 (ANNEXE 2) ;
- L’OG, l’AS et les experts appropriés se sont réunis le 01 février 2010 et ont agréé la liste des espèces dans chaque « C » catégorie (ANNEXE 3) ;
- Un atelier sur les avis de commerce non-préjudiciable (NDF) a eu lieu le 9-10 février 2010 à Antananarivo pour développer le chemin à suivre pour les scientifiques et l’AS à Madagascar pour délivrer NDF (ANNEXE 4) ;
- L’OG, l’AS et experts appropriés se sont réunis le 13 décembre 2010 et ont développé une nouvelle méthode pour le calcul du quota pour les caméléons (ANNEXE 5) ;
- Un comité de rédaction constitué par les représentants de l’OG, l’AS, Madagasikara Voakajy et l’IUCN/SSC Chameleon Specialist Group a été établi pour évaluer le nouvel quota obtenu en utilisant la formule, envers les avis de commerce non-préjudiciable.

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31 AC23 Doc. 8.2
32 AC24 Doc. 7.2
33 SC58 Doc. 21.3 (Rev. 1)
34 AC24 Doc. 9.1 (Reptile and Amphibian Working Group)
**Furcifer campani**
*Quota = 277*

Suivant les recommandations du group de travail sur le NDF nous avons mené une évaluation préliminaire du risque\(^{35}\). Ceci s’était basé sur les principes que CITES a fourni pour Madagascar en relation avec les caméléons (et les geckos diurnes) et suit la terminologie suivante\(^{36}\):

### Évaluation du risque : Moyen (‘C3’ *sensu* SC58 Doc. 21.3 (Rev. 1))

**Justification brève (voir documents d’appuis p. 55-59 pour les détails):**
- Espèce à une distribution restreinte
- Se trouve dans les savanes
- Quelques données sur la densité de la population sont disponibles
- Listée comme Vulnérable dans la Liste Rouge de l’UICN
- Pas de données publiées sur la reproduction et les tendances de la population

**Quota proposé = 277**

Ce quota est obtenu selon la procédure suivante :

**Densité de la population** :
Nous avons utilisé la seule densité estimée publiée sur cette espèce (Randrianantoandro et al. 2010):
\[
= 12,2 \text{ ha}^{-1}
\]

**Étendue de la Zone d’occurrence** :
La surface de la zone forestière dans les localités où cette espèce a été confirmée présente
\[
= 113 700 \text{ ha}
\]

**Taille de la population nationale** :
La population estimée des adultes et juvéniles dans les localités où cette espèce a été confirmée présente :
\[
= \text{densité de la population (12,2) x étendue de la zone d’occurrence (113 700)} = 1 387 140 \text{ individus}
\]

**Taille de la population hors aires protégées** :
Du à l’absence d’information précise, nous estimons que 10% de la surface de la zone forestière dans les localités où cette espèce existe, se trouve dans les zones où la collecte est allouée
\[
= \text{population estimée (= 1 387 140 individus) x 0,1}
\]
\[
= 138 714 \text{ individus}
\]

**Taille de la population viable** :
A partir de la population viable au dessus, nous estimons de façon prudente que 80% disparus annuellement suite aux causes naturelles et perte en habitat
\[
= \text{population estimée en dehors des aires protégées (138 714 individus) x 0,2}
\]
\[
= 27 743 \text{ individus}
\]

**Taille de la population pouvant être collecté** :
De la population à partir de la quelle les collectes peuvent avoir lieu, nous proposons que la collecte de 10% de cette population est apparemment pour être durable
\[
= \text{population viable (27 743) x 0,1}
\]
\[
= 2 774 \text{ individus}
\]

**Quota annuel** :

\(^{35}\) AC24 Doc. 9.1 (Reptile and Amphibian Working Group)

\(^{36}\) AC24 Doc. 7.2
Nous proposons un quota annuel qui représente le 10% de la potentielle collecte disponible
= population pouvant être collectée (2 774 individus) x 0,1
= 277

**Évaluation des Avis de Commerce Préjudiciables**

Réflexions en évaluant l’impact potentiel de la collecte de cette espèce :
- Petit caméléon très coloré exporté en grande quantité avant 1994 ;
- Restreinte dans la montagne et savane dans quelques sites où il n’y a relativement que quelques menaces ;
- Cas de collecte illicite est noté ;
- Cette espèce peut être facilement identifiée en utilisant les caractères morphologiques et la texture de la peau

**Décision et Justification** :

Un quota de 277 individus serait non-préjudiciable si:
- Les permis de collecte pour la région de Vakinankaratra en consultation avec les parties prenantes impliquées dans le processus de création de la nouvelle aire protégée Ankaratra ;
- Pas de permis de collecte délivré pour la région de Haute Matsiatra où se trouve le parc national d’Andringitra ;
- Un programme de formation, d'abord aux opérateurs et ensuite au personnel de l’OG qui vérifie les envois, est initié ;
- Le quota est évalué en 2011 après l’atelier sur la Liste Rouge des reptiles Malagasy (24-28 janvier) quand les cartes de distribution mise à jour seront disponibles ;
- L’OG informe l’AS sur le nombre de *F. campani* exporté annuellement ;

**Préparé par**

Christian Randrianantoandro
Madagasikara Voakajy & IUCN/SSC Chameleon Specialist Group

Dr. Richard K. B. Jenkins
Durrell Institute of Conservation and Ecology, Madagasikara Voakajy & IUCN/SSC Chameleon Specialist Group

Dr. Emilienne Razafimahatratra
Autorité Scientifique (Département de Biologie Animale, Université d’Antananarivo)

Sahondra Rabesihanaka
Organe de Gestion (Service de la Gestion de la Faune et de la Flore, Ministère de l’Environnement et des Forêts)
Supporting statement: *Furcifer campani*

1. TAXONOMY
1.1 Class
Reptilia

1.2 Order
Squamata

1.3 Family
Chamaeleonidae

1.4 Genus, species or subspecies, including author and year
*Furcifer campani* (Grandidier, 1872)

1.5 Scientific synonyms
*Chamaeleo octotaeniatus* Boettger, 1881
*Chamaeleon campani* Grandidier, 1872

1.6 Common names (including, where appropriate, trade names)
Campan’s Chameleon

1.7 Code numbers
If the species concerned is already included in the Appendices, refer to the code numbers in the CITES Identification Manual.

A-303.005.002.014

2. SPECIES STATUS
2.1 IUCN Red List Category
Vulnerable   A1cd   ver 2.3 (in need of updating; Madagascar Reptile & Amphibian Specialist Group 1996)

2.2 National legislation
Category I, Class II of (Annexe au decret n°. 2006 - 400 du 13 juin 2006 portant classement des espèces de faune sauvages).

2.3 CITES Appendix listing
Appendix II (date listed: 04/02/1977)

3. SPECIES CHARACTERISTICS
3.1 Distribution
This species is endemic to Madagascar and inhabits the central highlands from Parc National d’Andringitra in the south to Ankaratra in the north (Brygoo 1971; Vences, Andreone et al. 2002; Glaw and Vences 2007). Brygoo (1971) reported this species from sites such as Iby, Ambholimitombo and Ambatolampy but specimen evidence from these localities is lacking (Vences et al. 2002). It is found between 1,850 m and 2,500 m above sea-level (Raxworthy and Nussbaum 1996) and has a fragmented distribution in isolated massifs which suggests that its area of occupancy is quite small.

3.2 Habitat
It uses secondary heathland and savanna grasslands with shrubs and although occurs is sympatric with the widespread *Furcifer lateralis* it is tolerant of a narrower range of abiotic conditions (Raxworthy and Nussbaum 1996; Vences, Andreone et al. 2002; Andreone, Vences et al. 2007).
3.3 Biological characteristics
Le Berre (1995) reports clutches of 8 – 12 eggs with females in captivity laying 2 to 3 clutches each year and an incubation period of 9 months. Sexual maturity can reportedly be reached in as little as 3 months after hatching. Little information other is available on the biology of this species but it is able to survive in elevations as high as 2,489 m above sea-level (Randrianantoandro et al. 2010).

3.4 Morphological characteristics
This is a small colorful chameleon with strong sexual dimorphism. The maximum SVL attained by adults is 69 mm (Glaw and Vences 2007). Both sexes lack a rostral appendage but have lateral and dorsal crests. Males and beige to brown in coloration and females are green to blackish with colorful spots and three white lateral bands.

3.5 Role of the species in its ecosystem
The ecological role of chameleons is poorly known in Madagascar. Most species however feed on invertebrates. There is unlikely to be a significant impact on the ecosystem from removing small numbers of F. campani.

4. Status and Trends
4.1 Habitat trends
There are no available data on the trends in the habitat used by this species but it occurs in highland savanna grasslands that are unlikely to have undergone major changes in recent years.

4.2 Population size
There is little information on the size of the F. campani population with only a single published account of its density (Randrianantoandro et al. 2010). Using a sample of 47 observations from Ankaratra the population density of F. campani in the austral spring was 12.2 ha\(^{-1}\) (Randrianantoandro et al. 2010).

4.3 Population structure
There are no available published data on the population structure of this species.

4.4 Population trends
There is no available published information on the population trends of this species.

4.5 Geographic trends
There have been no major changes in the extent of occurrence of this species recently so its geographic trend is probably stable.

5. Threats
5.1 Nature
Randrianantoandro et al. (2010) reported bushfires and over-grazing as the main potential threats to F. campani, although the ability of the species to tolerate regular burning in the grasslands where it occurs is poorly understood, as is the magnitude of this potential impact. There are continued reports of collection of F. campani from areas within Ankaratra Randrianantoandro et al. (2010).

5.2 Intensity
There is little available information on the intensity of the threats but grassland burning occurs frequently in highland Madagascar.

5.3 Relative importance of any human-induced threats
All of the threats to this species are human-induced.
6. UTILIZATION AND TRADE
6.1 National utilization
Exports of this species from Madagascar were suspended by CITES in 1994 so there is minimal utilization of *F. campani* at the national level (Carpenter et al. 2004, 2005).

6.2 Legal trade
Information accessed from the CITES/WCMC Trade Database database shows that *F. campani* represented 58% of the 25,640 individual *Furcifer* chameleons exported from Madagascar in the period between 1978 and 2008. Thus, prior to the 1994 trade suspension *F. campani* was in considerable commercial demand.

6.3 Parts and derivatives in trade
There is no evidence that chameleon body parts or other derivatives are traded internationally.

6.4 Illegal trade
In a recent survey of chameleon traders in Bangkok TRAFFIC encountered eight *Furcifer* species from Madagascar on sale but *F. campani* was not observed. This survey lasted three weeks and repeat surveys over a longer period are needed to establish whether *F. campani* is traded illegal in Thailand.

6.5 Actual or potential trade impacts
Whilst a small annual harvest is unlikely to threaten *F. campani* it should be noted that there are major gaps in knowledge surrounding its biology.

7. LEGAL INSTRUMENTS
7.1 National
All but four *Furcifer* species from Madagascar were suspended from trade in 1994 (Carpenter et al. 2004, 2005). Existing legislation permits the collection of *F. campani* subject to authorization from the CITES Management and Scientific authorities.

7.2 International
This species is not protected internationally, but trade is controlled under the auspices of CITES.

8. SPECIES MANAGEMENT
8.1 Management measures
There are no programmes in place in Madagascar to manage *F. campani* because exports of this species have been suspended since 1994. It does however occur in a national park from where collection is prohibited. The traditional site for commercial collection of this species, at Ankaratra, is currently being designated a new protected area.

8.2 Population monitoring
There are no programmes in place to monitor this species. However, population surveys funded by the Darwin Initiative and Conservation International at Ankaratra (2009-2010) could be continued to monitor the impact of renewed legal collection of this species.

8.3 Control measures
8.3.1 International
As an Appendix II species exports and imports of *F. campani* will be subject to standard CITES procedures.

8.3.2 Domestic
Harvest quotas are produced and assessed by the Scientific Authority for Animals (Department of Animal Biology at the University of Antananarivo).
8.4 Captive breeding and artificial propagation
Whilst *F. campani* is found in captivity in Madagascar (e.g. Madagascar Exotic), there is no information available that suggests these programme are linked to supplying the commercial demand or are associated with captive breeding.

8.5 Habitat conservation
It occurs in a national park from where collection is prohibited. The traditional site for commercial collection of this species, at Ankaratra, is currently being designated a new protected area.

9. Information on similar species
This is a relatively easy species to identify and is sympatric with the common *F. lateralis* (Glaw and Vences 2007).

10. Consultations
Prepared by Richard Jenkins and Christian Randrianantoandro

11. References
Proposition pour la réouverture de l’exportation des caméléons collectés dans les milieux sauvages à Madagascar : *Furcifer minor*

**Contexte**

Étant donné que :
- Les espèces de caméléons Malagasy du genre *Calumma* et *Furcifer* sont inclues dans l’Annexe II et actuellement couverte par la notification 833 (Janvier 1995) ;
- Madagascar a amélioré significativement sa capacité pour l’implémentation de la CITES après la suspension du commerce ;
- Quelques caméléons sont suffisamment abondants pour tolérer une collecte modérée dans le milieu sauvage ;
- Les caméléons sont fortement demandés dans le commerce international des animaux de compagnie ;
- Les caméléons venant de Madagascar sont sujets à une exportation illicite continue ;
- CITES a invité Madagascar à considérer la réouverture du commerce des certaines espèces de caméléon ;
- Il y a un nouveau guidage disponible pour la réalisation des avis de commerce non-préjudiciable (NDF) ;

Les Autorités CITES à Madagascar, en collaboration avec les experts appropriés ont mené les activités suivantes :
- Une réunion a eu lieu à Antananarivo en octobre 2009 pour discuter la lettre provenant du secrétariat CITES (ANNEXE 1) ;
- L’Organe de Gestion (OG) et l’Autorité Scientifique (AS) CITES Madagascar ont demandé Madagasikara Voakajy (www.madagasikara-voakajy.org) de réviser la liste des espèces et les catégories prévisionnels (C1-C4) ;
- Madagasikara Voakajy a soumis le rapport à l’OG et l’AS en janvier 2010 (ANNEXE 2) ;
- L’OG, l’AS et les experts appropriés se sont réunis le 01 février 2010 et ont agréé la liste des espèces dans chaque « C » catégorie (ANNEXE 3) ;
- Un atelier sur les avis de commerce non-préjudiciable (NDF) a eu lieu le 9-10 février 2010 à Antananarivo pour développer le chemin à suivre pour les scientifiques et l’AS à Madagascar pour délivrer NDF (ANNEXE 4) ;
- L’OG, l’AS et experts appropriés se sont réunis le 13 décembre 2010 et ont développé une nouvelle méthode pour le calcul du quota pour les caméléons (ANNEXE 5) ;
- Un comité de rédaction constitué par les représentants de l’OG, l’AS, Madagasikara Voakajy et l’IUCN/SSC Chameleon Specialist Group a été établi pour évaluer le nouvel quota obtenu en utilisant la formule, envers les avis de commerce non-préjudiciable.

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37 AC23 Doc. 8.2  
38 AC24 Doc. 7.2  
39 SC58 Doc. 21.3 (Rev. 1)  
40 AC24 Doc. 9.1 (Reptile and Amphibian Working Group)
Suivant les recommandations du group de travail sur le NDF nous avons mené une évaluation préliminaire du risque\(^1\). Ceci s’était basé sur les principes que CITES a fourni pour Madagascar en relation avec les caméléons (et les geckos diurnes) et suit la terminologie suivante\(^2\) :

<table>
<thead>
<tr>
<th>Évaluation du risque</th>
<th>Moyen (‘C3’ \textit{sensu} SC58 Doc. 21.3 (Rev. 1))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Justification brève</td>
<td>(voir documents d’appuis p. 63-66 pour les détails) :</td>
</tr>
<tr>
<td>- Espèce à distribution restreinte</td>
<td></td>
</tr>
<tr>
<td>- Se trouve dans les terrains d’agriculture, forêts de tapia (\textit{Uapaca} spp.) et lisières de la forêt humide</td>
<td></td>
</tr>
<tr>
<td>- Quelques données sur la densité de la population sont disponibles</td>
<td></td>
</tr>
<tr>
<td>- Listée Vulnérable dans la Liste Rouge de l’UICN</td>
<td></td>
</tr>
<tr>
<td>- Pas de données publiées sur la reproduction ou les tendances de la population</td>
<td></td>
</tr>
</tbody>
</table>

**Quota proposé = 496**

Ce quota est obtenu selon la procédure suivante :

**Densité de la population** :
Nous avons utilisé la seule densité estimée publiée sur cette espèce (Randrianantoandro et al. 2010):

\[
= 16,4 \text{ ha}^{-1}
\]

**Étendue de la Zone d’occurrence** :
La surface de la zone forestière dans les localités où cette espèce a été confirmée présente :

\[
= 151 300 \text{ ha}
\]

**Taille de la population nationale** :
La population estimée des adultes et juvéniles dans les localités où cette espèce a été confirmée présente :

\[
= \text{densité de la population (16,4) x étendue de la zone d’occurrence (151 300)} = 2 481 320 \text{ individus}
\]

**Taille de la population hors aires protégées** :
Du à l’absence d’information précise, nous estimons que 10\% de la surface de la zone forestière dans les localités où cette espèce existe, se trouve dans les zones où la collecte est allouée

\[
= \text{population estimée (}2 481 320 \text{ individus}) \times 0,1
\]

\[
= 248 132 \text{ individus}
\]

**Taille de la population viable** :
A partir de la population viable au dessus, nous estimons de façon prudente que 80\% disparus annuellement suite aux causes naturelles et perte en habitat

\[
= \text{population estimée en dehors des aires protégées (}248 132 \text{ individus}) \times 0,2
\]

\[
= 49 626 \text{ individus}
\]

\(^1\) AC24 Doc. 9.1 (Reptile and Amphibian Working Group)

\(^2\) AC24 Doc. 7.2
Taille de la population pouvant être collecté :
De la population à partir de laquelle les collectes peuvent avoir lieu, nous proposons que la collecte de 10% de cette population est apparentement pour être durable
= population viable (49 626) x 0,1
= 4 963 individus

Quota annuel :
Nous proposons un quota annuel qui représente le 10% de la potentielle collecte disponible
= population pouvant être collectée (4 963 individus) x 0,1
= 496

Évaluation des Avis de Commerce Préjudiciables
Réflexions en évaluant l’impact potentiel de la collecte de cette espèce :
- C’est une espèce menacée qui se trouve dans la forêt de tapia et les terrains d’agriculture ;
- Cas de collecte illicite est noté à Itremo-Ambatofinahana ;
- Elle peut être confondue avec d’autres espèces de Furcifer ;

Décision et Justification :
Un quota de 496 individus serait non-préjudiciable si bien que :
- Permis de collecte délivré pour la région Amoron’i Mania en consultation avec les organisations responsables de la nouvelle aire protégée Itremo ;
- Un programme de formation, d'abord aux opérateurs et ensuite au personnel de l'OG qui vérifie les envois, est initié ;
- Le quota est évalué en 2011 après l'atelier sur la Liste Rouge des reptiles Malagasy (24-28 janvier) quand les cartes de distribution mise à jour seront disponibles ;
- L’OG informe l’AS sur le nombre de F. minor exporté annuellement ;

Préparé par
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Sahondra Rabesihanaka
Organe de Gestion (Service de la Gestion de la Faune et de la Flore, Ministère de l'Environnement et des Forêts)
Supporting statement: *Furcifer minor*

1. **TAXONOMY**
   1.1 Class
   Reptilia

   1.2 Order
   Squamata

   1.3 Family
   Chamaeleonidae

   1.4 Genus, species or subspecies, including author and year
   *Furcifer minor* (Günther, 1879)

   1.5 Scientific synonyms
   *Brookesia minor* (Günther, 1879)
   *Chamaeleon minor* Günther, 1879

   1.6 Common names (including, where appropriate, trade names)
   South-central
   Minor’s chameleon
   Lesser chameleon

   1.7 Code numbers
   If the species concerned is already included in the Appendices, refer to the code numbers in the CITES Identification Manual.
   A-303.005.002.045

2. **SPECIES STATUS**
   2.1 IUCN Red List Category
   Vulnerable  A1cd  ver 2.3 (in need of updating; Madagascar Reptile & Amphibian Specialist Group 1996)

   2.2 National legislation
   Category I, Class II of (Annexe au décret n°. 2006 - 400 du 13 juin 2006 portant classement des espèces de faune sauvages).

   2.3 CITES Appendix listing
   Appendix II (date listed: 04/02/1977)

3. **SPECIES CHARACTERISTICS**
   3.1 Distribution
   This species is endemic to Madagascar and appears restricted to the southern highlands although there is a single, questionable, record from Bélo-sur-mer on the west coast (Glaw and Vences 2007). Aside from the record on the west coast *F. minor* is restricted to an elevational range of between 1,060 m and 1,360 m above sea level (Raselimanana 1998).

   3.2 Habitat
   It has been reported as a forest species (IUCN/SSC, BIODEV et al. 1993) but has also been observed in coffee plantations in Itremo (Ramanantsoa 1974). These apparently contrasting statements were supported by Randrianantoandro et al. (2010) who found *F. minor* in similar numbers in both agricultural land and tapia (*Uapaca* spp.) woodland.
3.3 Biological characteristics
Little information is available on the biology of this species although a dissected female contained 12 eggs and oviposition occurs in April (Glaw and Vences 2007).

3.4 Morphological characteristics
This chameleon can reach SVL of 100 mm. Males possess distinctive bifurcate rostral appendage and a usually brown in color whilst females are largely green (Glaw and Vences 2007). Males somewhat resemble *Furcifer labordi*, *Furcifer willsii* and *Furcifer petteri* but can be separated based on size and color.

3.5 Role of the species in its ecosystem
The ecological role of chameleons is poorly known in Madagascar. Most species however feed on invertebrates. There is unlikely to be a significant impact on the ecosystem from removing small numbers of *F. minor*.

4. Status and Trends

4.1 Habitat trends
There are no available data on the trends in the habitat used by this species.

4.2 Population size
There is little information on the size of the *F. minor* population with only a single published account of its density (Randrianantoandro et al. 2010). Using a sample of 174 observations from Itremo the population density of *F. campani* in the austral spring was 16.4 ha$^{-1}$ with similar densities reported for farmland and tapia woodland (Randrianantoandro et al. 2010).

4.3 Population structure
There are no available published data on the population structure of this species.

4.4 Population trends
There is no available published information on the population trends of this species.

4.5 Geographic trends
There have been no major changes in the extent of occurrence of this species recently so its geographic trend is probably stable.

5. Threats

5.1 Nature
Randrianantoandro et al. (2010) reported expanding farmland, mining and logging as the main threats in Itremo. The extent to which these impact *F. minor* are poorly understood. There are continued reports of illegal collection of *F. minor* from areas around Itremo (Randrianantoandro et al. 2010).

5.2 Intensity
There is little available information on the intensity of the threats.

5.3 Relative importance of any human-induced threats
All of the threats to this species are human-induced.

6. Utilization and Trade

6.1 National utilization
Exports of this species from Madagascar were suspended by CITES in 1994 so there is minimal utilization of *F. minor* at the national level (Carpenter et al. 2004, 2005).

6.2 Legal trade
Information accessed from the CITES/WCMC Trade Database database shows that *F. minor* represented 11% of the 25,640 individual *Furcifer* chameleons exported from Madagascar in the
period between 1978 and 2008. Thus, prior to the 1994 trade suspension *F. minor* was subject to moderate commercial demand.

### 6.3 Parts and derivatives in trade

There is no evidence that chameleon body parts or other derivatives are traded internationally.

### 6.4 Illegal trade

In a recent survey of chameleon traders in Bangkok TRAFFIC encountered eight *Furcifer* species from Madagascar on sale and seven of the 107 were *F. minor*.

### 6.5 Actual or potential trade impacts

Whilst a small annual harvest is unlikely to threaten *F. minor* it should be noted that there are major gaps in knowledge surrounding its biology.

### 7. LEGAL INSTRUMENTS

#### 7.1 National

All but four *Furcifer* species from Madagascar were suspended from trade in 1994 (Carpenter et al. 2004, 2005). Existing legislation permits the collection of *F. minor* subject to authorization from the CITES Management and Scientific authorities.

#### 7.2 International

This species is not protected internationally, but trade is controlled under the auspices of CITES.

### 8. SPECIES MANAGEMENT

#### 8.1 Management measures

There are no programmes in place in Madagascar to manage *F. minor* because exports of this species have been suspended since 1994. The traditional site for commercial collection of this species, at Itremo, is currently being designated a new protected area.

#### 8.2 Population monitoring

There are no programmes in place to monitor this species.

#### 8.3 Control measures

##### 8.3.1 International

As an Appendix II species exports and imports of *F. minor* will be subject to standard CITES procedures.

##### 8.3.2 Domestic

Harvest quotas are produced and assessed by the Scientific Authority for Animals (Department of Animal Biology at the University of Antananarivo).

#### 8.4 Captive breeding and artificial propagation

Not programmes for this species.

#### 8.5 Habitat conservation

The traditional site for commercial collection of this species, at Itremo, is currently being designated a new protected area.

### 9. Information on similar species

This species can be confused with congeners, such as *F. labordi*, *F. willsii*, *F. petteri* (Glaw and Vences 2007).

### 10. Consultations

Prepared by Richard Jenkins and Christian Randrianantoandro
11. References
Downloaded on 31 December 2010.
Appendix 13
Bibliography


### Address list and web links

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<tr>
<th>Institution</th>
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<td>British High Commission Mauritius</td>
<td>British Interest Section C/o German Embassy Ambodirotra (101) Antananarivo, Madagascar</td>
<td><a href="http://www.fco.gov.uk">www.fco.gov.uk</a></td>
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<td>Durrell Institute of Conservation and Ecology</td>
<td>Department of Anthropology, University of Kent, Marlowe Building, Canterbury, Kent, CT2 7NR</td>
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<tr>
<td>International Union for Conservation of Nature</td>
<td>Rue Mauverney, 1196 Gland, Switzerland</td>
<td><a href="http://www.iucn.org">www.iucn.org</a></td>
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<tr>
<td>Madagascar Fauna Group</td>
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<td>Madagasikara Voakajy</td>
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<td>Department of Animal Biology University of Antananarivo</td>
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<td>World Wildlife Fund Madagascar &amp; West Indian Ocean Programme Office</td>
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## Distribution list

Reports submitted to the authorities and other partners:

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<td>Etude et suivi de caméléons et geckos dans le massif d’Ankaratra</td>
<td>CEF Ambatolampy, Commune Tsiafajavona-Ankaratra</td>
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