Final Evaluation Report

Your Details	
Full Name	Zanvo Stanislas
Project Title	Assessing post-release ecology of white-bellied pangolins rescued from illegal trade in the Dahomey Gap using both radio telemetry and camera trapping
Application ID	42943-B
Date of this Report	01 April 2025

1. Indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.

Objective	Not achieved	Partially achieved	Fully achieved	Comments
Estimate current offtake rate			✓	We rescued 19 alive individuals of white-bellied pangolin in a 95-day period from march to september, with a peak (11 individuals) in the dry season. These rescued individuals included three indivuals from the bushmeat market of tègon, four from the traditional medicine market of Bohicon and 13 individuals the village of tègon. Most of these individuals were seriously injured and had to be automatically released into the la Lama forest. We rescued two alive individuals from the community forest of Gnanhouizounmè that were not our study areas. In addition, a total of 41 specimens of white-bellied pangolins were recorded in the traditional medicine markets in southern Benin.
Assess the temporal trend of home range size and the activity patterns of rescued individuals			✓	The post-release monitoring data revealed a home range of 9.49 ha (varying between the lowest CI of 7.06 ha and a maximum CI of 12.28 ha) for female pangolin and 11.37 ha (varying between the lowest CI of 7.02 ha and a maximum CI of 16.74 ha). Our camera traps surveys revealed

				that the rescued pangolin's activity occurs between 9:00 pm to 5:00 am with a peak is around 5:00 am whereas non-rescued pangolin's activity occur between midnight (00:00) and early morning (around 06:00 am), with a pronounced peak between 02:00 and 05:00 the highest activity pattern is observed around 04:00. However, we extended the fieldwork (camera trap and telemetry surveys) until April 2025 in order to train a master student from ***Ecole Régionale Post-Universitaire d'Aménagement et de Gestion Intégrée des Forêts et Territoires Tropicaux (ERAIFT). The master student has been recommended by the Pangolin Specialist Group.*** So, these results did not include additional data.
understand intra-species and inter-species social interactions (potential trophic link) of rescued individuals that are released back into wild.			✓	Our arboreal survey using camera traps in the Lama Forest Reserve documented a community of 33 species from 13 orders and 22 families including mainly Benin Potto (*Perodicticus potto*), Demidoff's dwarf galago (*Galagoides demidoff*), Benin tree hyrax (*Dendrohyrax interfluvialis*) and mice that use the same trees with them. We extended the fieldwork (camera trap and telemetry surveys) for an additional three months in order to train a master student from ***Ecole Régionale Post-Universitaire d'Aménagement et de Gestion Intégrée des Forêts et***

				Territoires Tropicaux (ERAIFT). The master student has been recommended by the Pangolin Specialist Group.
Behaviour change campaign			✓	We conducted multiple section behaviour change campaigns in the three villages with men and women, farmers and hunters, and local authorities. However, each rescued intervention was dedicated to an awareness moment for the hunters and/or vendors in the wildlife market.

2. Describe the three most important outcomes of your project.

a). A total of 19 individuals (7 males and 12 females) of white-bellied pangolin were rescued in the villages and the bushmeat market surrounding the Lama forest reserve with a pic (15 individuals) during the dry season that corresponds to the hunting season. In addition, two individuals were rescued in the Gnanhouizounmè forest at ~25km. We the fitted with VHF four healthy and vigorous individuals among 19 individuals we rescued. Given the size and weight of the tags, we were unable to use them to monitor juveniles and baby pangolins, whose scales were too thin.

b). Data revealed a nocturnal activity pattern overlapping with those of *Dendrohyrax interfluvialis* and with whom they share the same habitat. The white-bellied pangolin in the lama forest is confined to undegraded facies, in particular semi-deciduous forests including liana trees. We delineated a relatively large home range (11.37 ha) dominated by lianas for male individuals compared to female (9.49 ha). The dormitory trees are characterized by the presence of cavities and ant mounds.

c). Investigations revealed an almost total absence of ground sightings, which can be explained by a change in the species' behaviour, which has become strictly arboreal in the Lama forest due to hunting pressure.

3. Explain any unforeseen difficulties that arose during the project and how these were tackled

In two cases, antecedents between the hunter and the leaders made the rescue process long. This has led to the failure of the process and consequently to the death of the pangolin before consensus is reached. The low proportion of rescued individuals in the bushmeat is probably due to the random control of forest officers in these market

4. Describe the involvement of local communities and how they have benefitted from the project.

We actively included local community in the implementation of the project. Our guides for camera trap and radiotracking surveys, interviews, forest inventory were selected among local people that we paid according to the modalities of the project. The rescue activity involved both local authorities and traditional gate keepers. Their participation improved substantially the rate success of the rescue. We conduct behaviour change campaigns with local communities including men and women, farmers and hunters, and local authorities.

5. Are there any plans to continue this work?
MSc. Maurice Agbimakou under my supervision will continue the fieldwork (camera trap and radiotracking surveys) for an additional three months.

We will maintain contact with local people and local authority engaged in the rescue operation in order to continue this activity.

6. How do you plan to share the results of your work with others?

I am supervising M. Maurice Agbimakou, Master student, recommended by the Pangolin Specialist Group for his Master research at *Ecole Régionale Post-Universitaire d'Aménagement et de Gestion Intégrée des Forêts et Territoires Tropicaux* (*ERAIFT*). He will use all the data we have already collected and those he will collect during the next three months together for his thesis dissertation. The Rufford Foundation will be acknowledged in the document but also during his oral presentation. Together with Maurice, we will publish the results in the journal Animal Conservation or Global Ecology and Conservation. The results of the project at the national tree day in June 2025.

7. Looking ahead, what do you feel are the important next steps?
For the next steps:

- Extend rescue interventions to all the last refuges of the white-bellied pangolin at national scale (Local communities, bushmeat and traditional medicine markets) in order to achieve behaviour change and effective conservation in Benin

- Establish in each hotspot a local club of engaged people in pangolin conservation

- Assess the alternatives to pangolins for bushmeat and traditional medicine practices in Benin

- Promotes the alternatives to pangolins among local people, in particular traditional practitioners and bushmeat vendors in Benin

- Conduct a national behaviour change campaigns using Radio podcasts

8. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did the Foundation receive any publicity during the course of your work?

- I acknowledge in my recent publication in the IUFRO News (IUFRO News Vol. 54, Issue 2) for the World Wildlife Day **https://www.iufro.org/publications/towards-effective-pangolin-conservation-in-benin**

- I also acknowledged the Rufford Foundation in my recent article published in the Journal Frontiers of Conservation Science on the wildlife trade in Traditional African Medicine. **https://doi.org/10.3389/fcosc.2024.1481791**

- I acknowledged the Rufford Foundation using its logo during my oral presentation at the 26th IUFRO world congress, held from 23 to 26th 2024, Stockholm (Sweden).

9. Provide a full list of all the members of your team and their role in the project.

Local people engaged in the rescue activity prefer anonymity.

Stanislas ZANVO: Project leader and PI, designed the study, operated and lead camera surveys, Radiotracking surveys, data analysis and publication in the IUFRO News (IUFRO News Vol. 54, Issue 2). Dr Zanvo, has been recommended by the Pangolin Specialist Group to supervise a Master thesis at (***Ecole Régionale Post-Universitaire d'Aménagement et de Gestion Intégrée des Forêts et Territoires Tropicaux*** (***ERAIFT***) So, Dr Zanvo is supervising M. Maurice Foundie Agbimakou from the ***Ecole Régionale Post-Universitaire d'Aménagement et de Gestion Intégrée des Forêts et Territoires Tropicaux*** (***ERAIFT***), for his master research on the white-bellied pangolin in the Lama. He conducted camera trap and radiotracking surveys with me in the Lama forest reserve.
Akpovi E. A. Françoise: Field Assistant, she was involved in the rescue activity and behaviour change campaign, data transcription.
Msc Guy Benjamin GUEGUE: He was a volunteer who worked with me (PI) for two months in order to learn the biomonitoring with radiotracking.
Owolabi Alfred ABIODOUN (local guide): He was the field guide for the camera trap surveys.
Kolawole Kola ABIODOUN (local guide): He was the field guide for the radiotracking surveys.

10. Any other comments?

No

ANNEX – Financial Report

Your Details	
Full Name	Zanvo Stanislas
Project Title	Assessing post-release ecology of white-bellied pangolins rescued from illegal trade in the Dahomey Gap using both radio telemetry and camera trapping
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Using the budget provided with your original application, please give a breakdown of budgeted versus actual expenditure. If there is a difference between the budgeted and actual amounts, please explain why.

We used £150 instead of £100 for the incentives of local hunters, who deliberately agreed to hand over the pangolin they had caught with details about the hunting sites. The surplus was taken from the subsistence of the principal investigator, Dr Stanislas Zanvo.

If there are funds remaining, these should be returned to the foundation. We will provide details of how this can be done.

No

It is important that you retain the management accounts and all paid invoices relating to the project for at least 2 years as these may be required for inspection at our discretion.

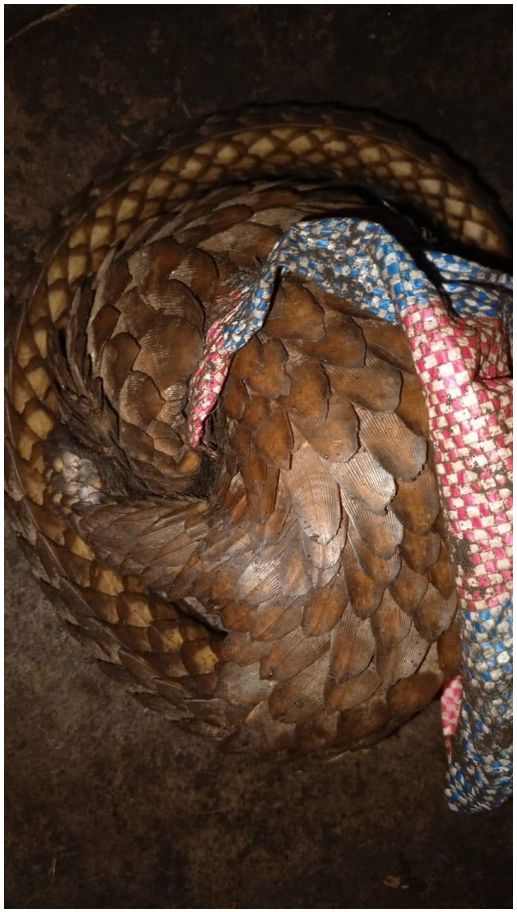
Ok

All figures should be given in pound sterling, indicating the local exchange rate used.

[Intentionally deleted]

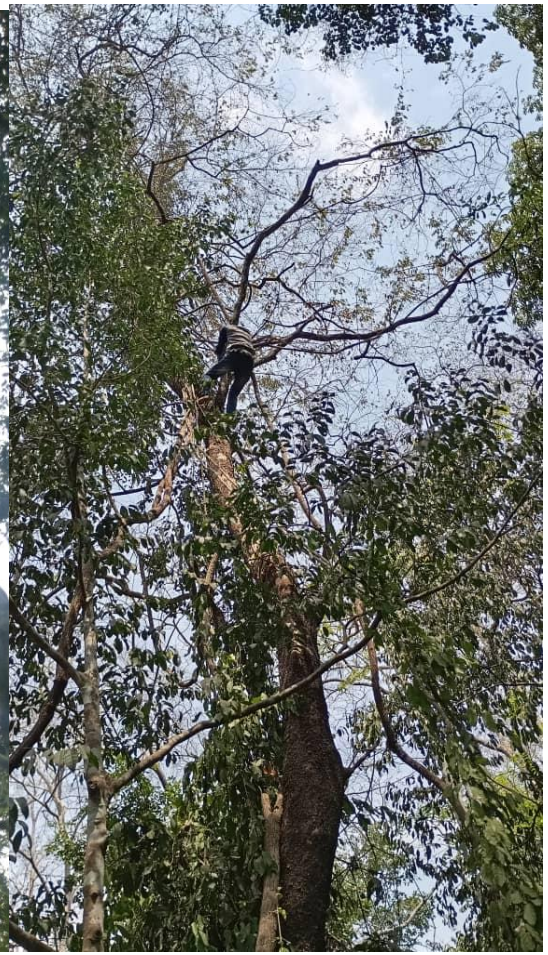
Annexe 1: Field photos

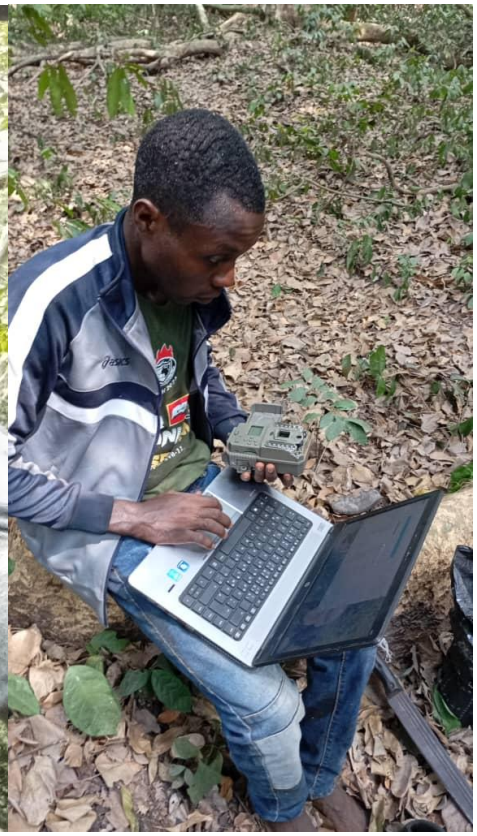
Rescue operation



Radiotracking survey

Camera trap survey



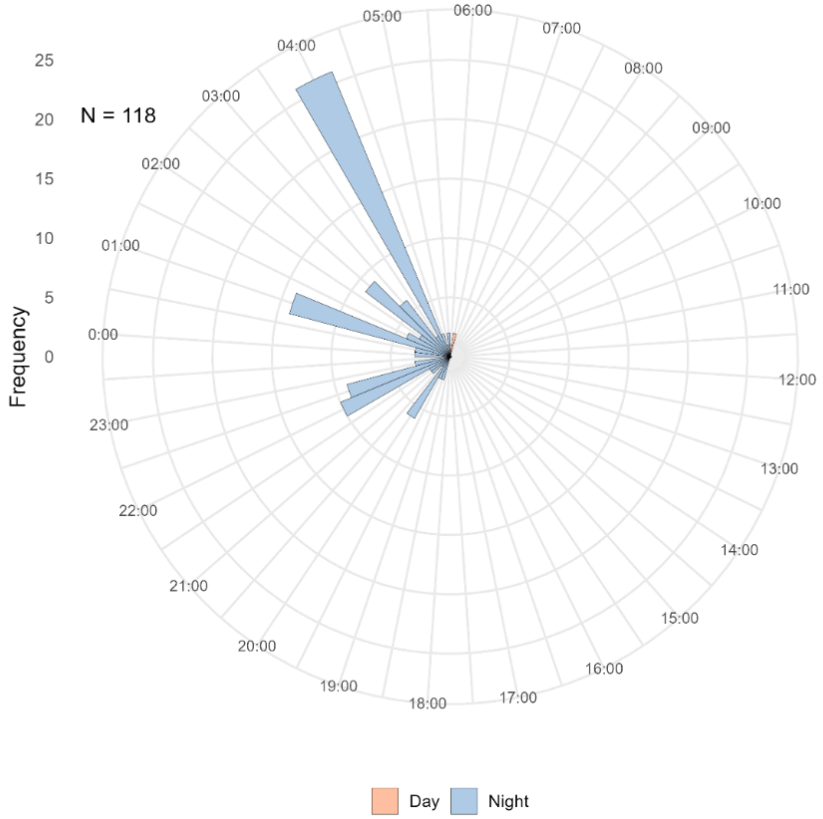


Behaviour change campaign

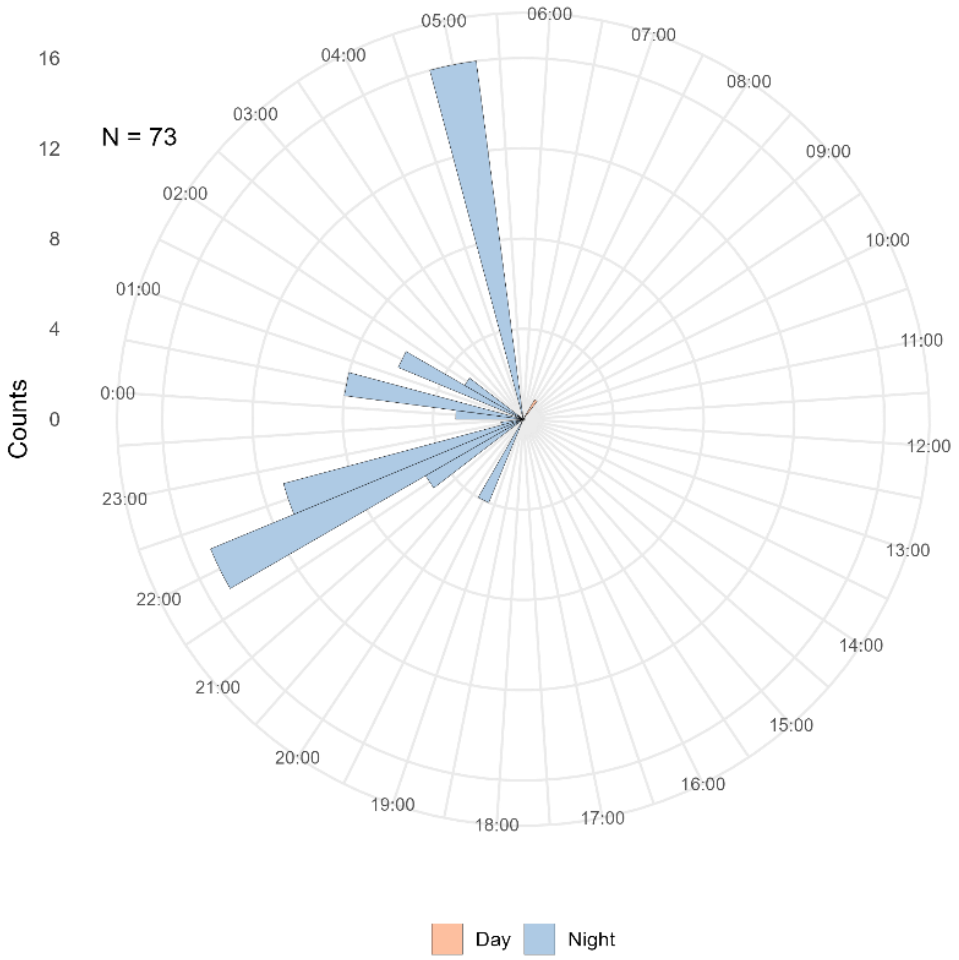
Annexe 2: Purchased materials

Annexe 3: Preliminary data analysis

Activity patterns of rescued vs. non-rescued white-bellied pangolin using camera trap data

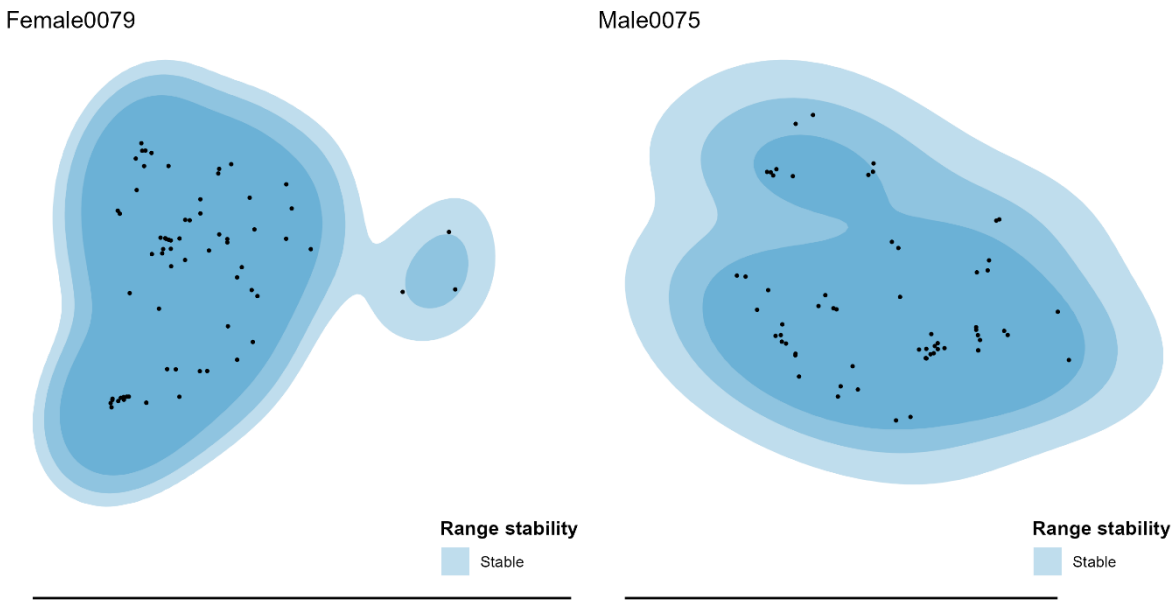


Activity pattern of the White-bellied pangolin in Lama Forest using data from camera trap survey



Activity pattern of rescued white-bellied pangolins

Home range maps from radiotracking data



The 95 % contour AKDE area estimates mapped. Upper 95 % confidence level is shown with the darkest shading, the mean point estimate is shown with a medium level of shading, and the lower 95% confidence interval is shown with the lightest shading. Scale bars represent 400 m. Blue coloured areas are ranges considered stable

Annexe 4: Notification Letter from the regional school (*Ecole Régionale Post-Universitaire d'Aménagement et de Gestion Intégrée des Forêts et Territoires Tropicaux* (*ERAIFT*) RD Congo) for my supervision of the Master thesis research of M. Maurice Foundie Agbimakou

ÉCOLE RÉGIONALE POST-UNIVERSITAIRE D'AMÉNAGEMENT ET DE GESTION INTEGRÉS DES FORÊTS ET TERRITOIRES TROPICAUX
- ÉRAIFT -
Centre de Catégorie II sous les auspices de l'UNESCO

Kinshasa, le 28 février 2025

N/Ref. : ER/BM/JPM/120/Not.TFE/25

Objet : Votre Notification en qualité de promoteur et co-promoteur de ce travail de fin d'études (TFE)

Messieurs les Professeurs :
- Stephan NTIE, ERAIFT, Promoteur
  Email : ntiestephan@gmail.com
- Stanislas ZANVO, LEA-FSA, Co-promoteur
  Email : zanvostanislas@yahoo.fr

Messieurs les Professeurs,

Nous sommes heureux de vous informer qu'il a plu à la direction de l'ERAIFT de vous nommer comme promoteur et co-promoteur, pour conduire ce travail de fin d'études intitulé : « *Post-release ecology of the white-bellied pangolins (Phataginus tricuspis) rescued from illegal trade using camera trapping and telemetry in the Lama Forest Reserve in Benin* ». Ce travail est réalisé par l'apprenant Maurice FOUNDIE de nationalité béninoise.

En effet, cette étude s'inscrit dans le cadre de la 5ème promotion des masters régionaux de l'ERAIFT avec comme spécialisation : *Master 2 Professionnel Gestion des Aires Protégées et Gestion des Réserves de Biosphère (GAP/GRB)*, et se déroule de janvier à juin 2025 (Semestre 4).

Ainsi, les tâches suivantes incombent au promoteur et co-promoteur pour l'accompagnement de cette étude :

1. Assurer le suivi régulier du travail depuis sa conception jusqu'à sa mise en œuvre sur le terrain ;
2. Faire des évaluations à mi-parcours sur le cheminement du travail et en informer l'ERAIFT ;
3. Assurer le suivi de la récolte des données, leur traitement ainsi que l'écriture scientifique du travail selon les directives de l'ERAIFT ;
4. Préparer l'apprenant à la soutenance publique de son mémoire (PowerPoint et communication orale) ;
5. Informer l'Ecole de tout incident éventuel survenu sur le terrain ou dérapages constatés chez l'apprenant ;
6. Assurer le respect des règles d'éthique scientifique et du CLIP auprès des communautés locales ;
7. Conduire cette dissertation jusqu'à sa soutenance publique et participer au jury.
8. Préparer l'apprenant à la valorisation de ses données de recherche en publication scientifique internationale.

Veuillez agréer, Messieurs les formateurs et chers collègues, l'expression de notre franche collaboration.

Le Directeur de l'ERAIFT

Baudouin MICHEL

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