

## Final Evaluation Report

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Your Details	
Full Name	Abderrazak El Alami
Project Title	Human–carnivore conflict and threatened species management and conservation in the central High Atlas Mountains, Morocco
Application ID	28562-1
Date of this Report	24 April 2022

**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
Determination of the status of native carnivores.				This objective was fully achieved. We used a combination of standardised interviews and the direct survey method to determine the status of the carnivore species in the central High Atlas (CHA).
Assessment of human-carnivore conflict.				The questionnaire interviews to collect data were used. We assessed the opinion of local people about carnivore species; the problems caused by these predators, especially on domestic animals; the capture, poisoning and killing of carnivores.
Study of the ecology of each species: distribution, estimated population, habitats, threats, human effects, capture and poaching.				We have been able to carry out studies on <i>Canis</i> species, <i>Vulpes vulpes</i> , <i>Lutra lutra</i> and <i>Hyaena hyaena</i> . Due to lack of time due to the Covid-19 pandemic, we have only identified the status of <i>Felis silvestris</i> , <i>Herpestes ichneumon</i> , <i>Mustela nivalis</i> and <i>Genetta genetta</i> , without having collected in-depth data on their ecology and habitats.
Identification of the major threats and challenges to the carnivore species conservation.				We studied the threats to carnivore species in the CHA and we identified the effects of human activities on their populations, especially the overhunting, habitat destruction and loss, population fragmentation, risk of local extinction, local people-carnivore conflict and negative attitudes toward these animals.
Management of the human-carnivore conflict to increase public tolerance for wild and find the possible solutions and to develop a plan for the conservation of threatened species.				The project recommend the urgent measures may need to be taken: 1. encouraging development projects in the CHA, 2. establishment of other protected areas, 3. increasing surveillance of wild habitats, 4. education to raise the awareness of the local people, 5. education to raise the awareness of the local people, 6. conduction of additional scientific research, 7. Management of human-carnivore interactions, 8. encourage

			residents to use some non-lethal techniques to protect livestock and to keep predators away, and 9. elaboration of compensation programmes to assist local people by reimbursing them for losses attributable to wild carnivores.
Education to raise the awareness of the local people, local and regional authorities, associations and students about the ecological and economical roles of wild carnivores and the importance of the conservation of them.			<p>We planned to share the results with regional and national authorities, local inhabitants, associations, and students. During the studies, we discussed the ecological and economic roles of carnivores and the importance of conserving them in more than 25 villages. We participated in the organisation of meetings with some biodiversity officials, researchers, leaders of associations on the importance of carnivores and biodiversity in the HAC. We also published the results of the project in regional and national newspapers to raise public awareness on the conservation of carnivores and wildlife.</p> <p>But due to the Covid-19 pandemic, we were unable to contact all planned schools and share carnivore information with students in this area.</p>

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

- a) Determination of the status of the carnivore species, first record of one species and rediscover of two species after more than 20 years:** The main goal of the questionnaire interviews and field surveys was to determine the status and the major threats to carnivore species conservation in the CHA. The results allowed us to update the data on carnivores. The last available data on carnivores in the HAC date back more than 20 years. We determined the status of carnivores in the CHA with remarkable results about three species. 1. This is the first study that has proven the presence of the African wolf *Canis lupus lupaster* in the CHA and we found individuals killed and others captured by local inhabitants. 2. We have rediscovered the striped hyaena *Hyaena hyaena* after 22 years and Egyptian mongoose *Herpestes ichneumon* after 20 years. We confirmed that the three species are not completely disappeared from the CHA, as most scientists and ecologists believe. The results of the studies carried out within the framework of this project showed that the carnivores species are today threatened in this area: the panther *Panthera pardus* and the serval *Leptailurus serval*: extinct; the common genet *Genetta genetta*, the Egyptian mongoose *Herpestes ichneumon* and the striped hyaena *Hyaena hyaena*: rare; the wildcat *Felis silvestris* and the Eurasian otter *Lutra lutra*: less abundant; the golden jackal *Canis aureus*, the African wolf *Canis lupus lupaster*, the red fox *Vulpes vulpes* and the least weasel *Mustela*

*nivalis*: relatively abundant. The carnivores are mainly threatened by overhunting, habitat destruction, a highly fragmented population and the risk of local extinction.

- b). Human-carnivore conflict and effect of human on carnivore species:** Interview results showed that the totality of the interviewees agreed that the wild carnivore presence near their villages is unfavorable and that they have problems with the carnivore species. The predation of livestock is the main cause of the local people-carnivore conflict and of negative attitudes toward these animals. The carnivore species most frequently reported for predation of domestic animals by the interviewees were the African wolf and the golden jackal, followed by the red fox, the common genet, and the striped hyaena *Hyaena hyaena*. Results showed that local people contributed to the poisoning or the killing of wild carnivores. We have found carcass of individuals of the African wolf, the red fox and of the common genet killed by local people in this area. In addition, we documented living individuals of wild carnivore captured by the inhabitants.

This project confirmed that poaching, capture and poisoning of carnivores exists, and its scale has increased in recent years. Scientific results of this project confirmed that the effect of human on carnivore populations is among the major problems responsible of the decline of carnivore species and the human-carnivore conflict may act as factors in the decline carnivore populations. In the study area, although the inhabitants know that it is forbidden to capture or kill wild carnivores, they continue to use illegal techniques such as poisoning against these carnivores.

- c). Conservation of native carnivores in the CHA:** This study showed that there were increasing problems of conflict between inhabitants and wild carnivores. This project confirmed that conservation efforts on behalf of the carnivore species should consider the local people opinion regarding human-carnivore conflict and the advantages and disadvantages of the presence of these predators. Based on results of this project, we recommend several measures to reduce the likelihood of the carnivore species becoming extinct in the CHA of Morocco: (1) encouraging development projects involving inhabitants, local authorities and associations in the surveillance of the carnivore species and of their habitats, (2) establishment of other protected areas in the CHA, (3) increasing surveillance of wild habitats to minimise the effects of humans on carnivore species, (4) the enforcement of the existing law against illegal capturing, empoisoning and killing of wild carnivores, (5) education to raise the awareness of the local people about the ecological and economical roles of wild carnivores and provide the public with information on the benefits of wild carnivores, (6) conducting scientific research on the effects of human activities and behaviors on carnivore species, (7) manage human-carnivore interactions to increase public tolerance for wild carnivores, (8) encourage residents to use some non-lethal techniques to protect livestock and to keep predators away, such as a livestock guard dogs, prompt and proper disposal of livestock carcasses to eliminate attractants that could draw carnivores, and monitoring and

pasturing of livestock, and (9) preparation and elaboration of compensation programmes to assist local people by reimbursing them for losses attributable to wild carnivores.

Results were published in scientific articles in national and international peer-reviewed journals (five were published and two are in preparation).

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

In response to the progression of the Covid-19 epidemic, Morocco's state of health emergency came into effect 20 March 2020. Extension of the state of health emergency was on several occasions. This had a significant effect on our work because we were unable to carry out the interviews with the local inhabitants and the field surveys on the planned dates. In addition, we were unable to travel around the HAC and visit several regions. The work planned for 2020 was carried out between October 2020 and February 2022. We were able to carry out most of the work during this period. This forced us to make significant changes in our work and personal lives.

The Rufford Foundation have approved a 1st Rufford Small Grant of £4000 (48 742, 72 MDH) to support our project. But we only received 70% of this amount (33 679, 89 MDH) because according to Moroccan law regarding the funds transferred from abroad, the organisation that received the funds (AESVT BENI MELLAL) must draw 30% from the fund (income tax), in addition to withdrawal of an amount of 440 MDH (commission fees and taxes). I informed the foundation on March 06, 2020. I am committed to carrying out all parts of the project despite this change in the budget. To cope with this, we have minimised expenses; in addition, we committed to pay any fees necessary to complete the project.

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

During this project, we visited more than 25 villages in the HAC. We conducted over 600 interviews with local residents to collect recent data on carnivores and to assess human-carnivore interaction. At the end of each interview, we discussed with local people the ecological and economic roles of carnivores and the importance of conserving them. We have made people aware of the ecological consequences of the eradication of these predators, such as the increase in the wild boar population, which is today the main crop pest, in addition to its aggression against the inhabitants. We targeted people who work in the forests, many of whom have been involved in poaching, capturing and poisoning of these animals. We also reminded the inhabitants that the law in Morocco prohibits these works and that they risk being arrested by the authorities.

Field surveys were made with the help of assistants. These local people are paid from the fund. During the outings, the assistants received training on carnivores, their roles and the importance of conserving them. In addition, they learned a lot of information about the behaviour of these animals. Many of them were positive

about the subject and they helped us a lot in contacting some poachers and some local people who participated in the capture or poisoning of carnivores to discuss with them and remind them of the consequences of these activities.

We also encourage some associations to initiate development projects, such as the medicinal plant cultivation project developed by the the M'goun Geopark association in the CHA to encourage the economy of local inhabitants in order to reduce their dependence on forests for living.

## **5. Are there any plans to continue this work?**

I was born and lived in the central High Atlas of Morocco, and I have many interests to conserve fauna and flora in this area. Since 2002, I conducted scientific research on Barbary macaques, other wild mammals, births flora. I conducted research without any finance or scholarships because the conservation of species and ecosystems is a personal concern.

In this project, we (me and my collaborators) studied carnivores. Our future work will be on other mammals, especially those listed as endangered or threatened on the IUCN Red List.

- a. We have developed a plan to study the Endangered Barbary macaque *Macaca sylvanus* population in the northern part of the HAC. Today, we have no data on this population. Indeed, it is very important to study it because it exists in an intermediate region between the Middle Atlas, where there are more than 65% of the world population of this species, and the HAC where there are small populations. The study of this population is very important for the conservation of this primate.
- b. In parallel, we prepared to study the last populations, discovered during our current project, of the Near Threatened striped hyaena *Hyaena hyaena*, of the Egyptian mongoose *Herpestes ichneumon* and of the serval *Leptailurus serval*, of which some inhabitants have mentioned the recent observations.

In these projects, we will study the ecology and status of the populations of these species, in addition to the identification of the main threats to each species. We will develop measures to be taken to conserve them, of course involving local inhabitants, regional and national authorities, organisations and associations in the protection of habitats and species.

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

In parallel with scientific studies, we have worked to share results, recommendations and messages about carnivore conservation with:

- a. Local inhabitants living in many villages in the CHA: more than 600 local people.



- b. Non-governmental organisations (local and regional associations and organisations) such as the Moroccan Association of Life and Earth Sciences Teachers and the M'goun Geopark Association.
- c. Government authorities: regional department of Water and Forests of Beni Mellal, Academy of Education and Training of Beni Mellal-Khenifra, the regional council of Beni Mellal Khenifra. Researchers from University of Sultan Moulay Slimane Beni Mellal, University of Cadi Ayyad Marrakech and from University of Hassan II Casablanca.
- d. Researchers, local people, regional and national authorities, and NGOs: a [workshop](#) in the town of Azilal (5 May 2021).
- e. Public and citizens: Articles in local language in regional and national newspapers: e.g., 1. [Biodiversity and carnivores in the CHA](#), 2. [Ecological consequence of Biodiversity loss in the CHA](#), 3. [Biodiversity, an essential component for the M'goun global geopark development](#).
- f. Scientists and biodiversity officials around the world: Scientific articles in national and international peer-reviewed journals (five were published and two are in preparation).
- g. We have also disseminated summaries of scientific studies and conservation activities on wild animals (carnivores, primates and others) in PANORAMA – Solutions for a Healthy Planet (supported by IUCN, UN environment programme, World Bank Group, etc.): Solution title: [Human-wildlife conflict and threatened species management in the protected areas of the central High Atlas, Morocco](#).
- h.

The next step is to share the results of this project with more GOs and NGOs (there are more than 50 development and environment associations in the HAC), and with students, especially young local people living in different villages of the CHA.

## **7. Looking ahead, what do you feel are the important next steps?**

Share the results of this project and disseminate messages on the economic and ecological roles of carnivores, sensitise local inhabitants in other villages, and involve regional and national authorities in species and habitat conservation measures.

Carrying out other research studies on other mammals, especially those listed as endangered or threatened on the IUCN Red List.

## **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?**

In all scientific publications, we acknowledge The Rufford Foundation for providing funding for our project (with URL of the project page in the foundation website),

During all communications, we reminded that our project was funded by The Rufford Foundation, always with the logo of the foundation visible to all participants.

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

**Prof Abderrahman Chait** is Professor of Ecology, Pharmacology, Neurobiology, Anthropobiology and Environment at the Faculty of Science Semlalia, Cadi Ayyad University Marrakech. Since the 1990s, he actively supervises many Master and PhD students. He has many interests to conserve biodiversity and ecosystems in the CHA. He has conducted extensive research on various aspects of ecology, conservation biology and sustainable development. He has published several books and written numerous articles in scientific journals.

**Prof Fattah Abderrazak** is a research professor of ecology in the Hassan II University of Casablanca, responsible for two modules of ecology and one module of faunistic. Within the framework of scientific research projects, Professor Fattah has published several scientific papers concerning amphibians, arthropods and mammals. His favourite research areas are herpetology, ethology, ecosystem ecology and conservation biology.

**10. Any other comments?**

I would like to sincerely thank The Rufford Foundation for funding this project. Although we had great interest in carrying out this project, we do not have the necessary budget. The help of the foundation allowed us to carry it out it. Samples of photos taken during this project:



First record of the African wolf *Canis lupus lupaster* in the CHA.





Rediscovery of the striped hyena *Hyaena hyaena* (Carnivores: Hyaenidae) in the central High Atlas after 22 years.



Rediscovery of the Egyptian mongoose *Herpestes ichneumon* in the central High Atlas after 22 years (a burrow where a mongoose has been observed, outside its fresh droppings).





Illegal empoisoning, capture and killing of carnivore species in the CHA.





Example of damage caused by carnivores to domestic animals in the HAC.







Communications about the carnivores and biodiversity conservation (Azilal, 06 May 2021).







Surveys on carnivore species in the CHA, with local inhabitants.