

## Final Evaluation Report

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Your Details	
<b>Full Name</b>	Javier Alonso Ortiz Medina
<b>Project Title</b>	Ecology of the Yucatecan Cantil ( <i>Agkistrodon russeolus</i> Gloyd, 1972) on the northern coast of Yucatan, Mexico
<b>Application ID</b>	30049-1
<b>Date of this Report</b>	£ 5,708

**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
Provide, for the first time, scientific knowledge about fundamental aspects of the ecology and natural history of the Yucatecan Cantil.				We observed several <i>A. russeolus</i> snakes during 1.5 years in the field, obtaining not only sufficient information on the movement ecology and diet composition of the species, but also on other aspects such as predators, reproduction, behaviour, parasites, and morphology variation throughout its distribution. These additional data will be processed to publish them as well.
Determine the home range, movement patterns, habitat selection, and diet composition of the Yucatecan Cantil.				We analysed the variation in the diet composition of <i>A. russeolus</i> between age classes, sexes, body sizes, colour morphs, climatic season, and geographic regions as well as the variation in morphology with emphasis on sexual dimorphism and geographic variation, of which we have an article accepted for publication in the journal <i>Herpetologica</i> . In addition, we obtained information on the home range, movement patterns, and habitat selection from 12 adult snakes, from three study sites with different degrees of enthronisation. We are currently analysing and comparing the data between sexes, study sites, and seasons, to publish in another article.

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

We elucidate in detail several of the unknown aspects of the ecology and natural history of *A. russeolus*, a species about which practically nothing was known before this study was conducted:

- a).** We described the intraspecific variation of the diet and morphology of the species throughout its distribution.

**b).** We studied the size of the area that individuals use, the characteristics of the microhabitat that they select and the activity patterns of the species.

**c).** We documented additional natural history aspects on this snake species, such as predators, parasites, reproduction, and behaviour.

This data is important because they constitute valuable information that guides us to understand the habitat requirements of the species that we need to conserve, as well as the effect that anthropogenic modifications have on its ecology. Furthermore, as this is the first study of its kind on *Agkistrodon* from Central America, this information will be useful in predicting aspects of the ecology of closely related species (i.e., *A. bilineatus*, *A. howardgloydi*, *A. taylori*).

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

The greatest unforeseen difficulties in this project arose due to the coronavirus pandemic (Covid-19). The global public health situation caused by this disease forced us to reschedule the project for approximately 1 year. In addition, among the local prevention measures taken by the government of Yucatán, was the restriction of no vehicular mobility from 11:00 p.m. to 5:00 a.m., temporarily limiting our night-driving hours in search of snakes. Also, the access to certain municipalities in the state, including several on the coast, was blocked to prevent tourists from accessing the beaches and spreading the disease.

However, even with these sanitary restrictions, and thanks to the funding granted by The Rufford Foundation, we were able to cope with the situation. In fact, we expanded the study of diet to include almost the entire known distribution range of the species instead of just analysing the diet of populations from the northern coast of Yucatán, as we initially proposed. With this, we were not only able to analyse in more detail the diet of the species but we were also able to incorporate detailed analyses of the geographic variation of the morphology of the species (i.e., body size, sexual dimorphism, coloration) that further broadens the knowledge of the natural history of *A. russeolus*.

Regarding the radio-telemetry topic of the study, we had to change the non-anthropised site that we had initially chosen for the study because of access restrictions and logistical issues. The new site selection was successful because the environmental characteristics were also ideal (natural coastal dune vegetation with no human constructions), plus it was more accessible, which allowed us to effectively monitor snakes during the study period, and it was at a shorter distance from the other sites, which benefited us in the management of resources destined for gasoline.

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

We took advantage of every interaction we had with local people to talk about our study, the importance of snakes in the ecosystem, and why we should conserve them. With this we form friendly connections with villagers from the communities to continue monitoring the snake population and to develop the next phase of the project, including environmental education.

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

Yes, this project left me with new and deeper questions to investigate about the ecology of *A. russeolus* in the northern coast of Yucatán, an area that has been highly impacted by human development and in which it is urgent to conserve the vegetation that persists and restore potential areas for the region's native flora and fauna. The results obtained in this project will be the basis for the upcoming studies.

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

The results of this project will be shared with the scientific community through publications in peer-reviewed journals. In fact, we already have a short natural history note published in the journal *Herpetological Review* (mentioned in the June 2022 update report), an article entitled "Intraspecific Variation in Diet Composition and Morphology of the Yucatecan Cantil *Agkistrodon russeolus* Gloyd, 1972 (Serpentes: Viperidae)", which was accepted for publication in the journal *Herpetologica*, and we are currently analysing the results and writing an article on home range, habitat selection, and movement patterns of *A. russeolus*, which we will submit to another journal as soon as possible. We also plan to create educational material such as posters, infographics, and brochures to spread in local communities and on the internet.

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

We consider there are two very important next steps: the first is to achieve a greater rapprochement with the communities, mainly in schools, to educate about the importance of snakes (with special emphasis on *A. russeolus*), and instil respect not only for these animals, but in general to the native fauna and flora. The other step is to develop further research to achieve long-term monitoring of *A. russeolus* populations and the protection of their coastal habitat, which is also critical for many others endangered plant and animal species.

**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?**

The Rufford Foundation logo was included in presentations (PowerPoint) of advances in ECOSUR internal student colloquiums, it will also be used in the PhD thesis as the main sponsor of the project. It will be used in the divulgation material (posters, etc.) that we will produce soon. In addition, The Rufford Foundation

appears in the acknowledgments section of every academic publication we produce for financially supporting this project. The sponsorship of the project by The Rufford Foundation was also mentioned in Facebook posts through the Herp.mx web page.

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

**Javier Alonso Ortiz Medina, MSc (ECOSUR):** I am the leader of this project, and I have been in charge of carrying out the field and laboratory work, analyses and curation of the data, and writing the manuscripts derived from this project.

**José Rogelio Cedeño Vázquez, PhD (ECOSUR):** He is my PhD director and has played a major role in overseeing the project and helping write the manuscripts. He has been in charge of managing matters related to the grant through ECOSUR.

**David González Solís, PhD (ECOSUR):** He is my doctoral advisor and has played an important role in reviewing the analyses and writing of the manuscripts.

**José Benjamín Morales Vela, PhD (ECOSUR):** He is my doctoral advisor and has played an important role in reviewing the analyses and writing of the manuscripts.

**Vicente Mata Silva, PhD (UTEP):** He is my doctoral advisor and has played an important role in reviewing the analyses and writing of the manuscripts.

#### **10. Any other comments?**

I am extremely grateful to The Rufford Foundation for their generous support for the conservation of *A. russeolus* and making this project possible.



A male *Agkistrodon russeolus* in its habitat.