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Perception of ranchers about the predator attack insurance in the Calakmul region, Campeche, Mexico

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ABSTRACT

Objective: To evaluate the operation of the Fondo de Aseguramiento Ganadero and its effectiveness regarding predator attacks, through the perception of ranchers who operate in the area of influence of the Calakmul Biosphere Reserve.

Design/Methodology/Approach: The communities were visited in order to contact and ask the permission of the ejido authorities, as well as to inform ranchers about the activities. The streets of the communities were randomly covered by our team and a survey was carried out with all the available producers. The snowball method was used to identify producers who have been impacted by predator attacks.

Results: Seventy surveys were carried out with ranchers of 18 communities from the northern, central, and southern regions of the area of influence of the Calakmul Biosphere Reserve (RBC), from October 2019 to January 2020. All the interviewed ranchers have been impacted by predator attacks; however, only 27% of them have reported the attacks to the Seguro de Ataques por Depredadores (Predator Attacks Insurance, SAD) and have obtained a compensation for their losses. Eighty-eight percent of the ranchers have received an immediate answer from the technician in charge of the insurance. Fifty-six percent of the ranchers mentioned that SAD has beneficial effects, 28% said they are not aware of its potential benefits, and 13% think that SAD does not have beneficial effects.

Study Limitations/Implications: Although producers who have requested the insurance were identified, many other producers who have been impacted by predator attacks have not reported them. In many cases, the producers hunt the predator. Hunting these predators is illegal; therefore, producers decided not to provide the required information.

Key words: jaguar, carnivore, protected area, preservation.

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INTRODUCTION

The first species that disappear are those that can be found in areas with high human population and in which directly threatened species live —*i.e.*, wolves or felines (Hoogesteijn, *et al.*, 2016). In Mexico, the illegal hunting of jaguar takes place in both protected and unprotected areas (Núñez, 2020). In many rural and wild areas, where livestock is the main economic activity, actual or alleged livestock predators are hunted or poisoned (Rosas-Rosas and Valdez, 2010). Núñez-Pérez *et al.* (2020) have suggested that retaliatory killing is one of the main causes of the death and decline of wild felines.

Predation has an irregular spatial and temporal distribution. Additionally, it is more frequent near or inside forests, as well as in places with low biomass of natural preys, as a result of either hunting or habitat destruction (Hoogesteijn *et al.*, 2016).

Among other factors, the economic impact of predator attacks depends on the type of livestock management, the economic level of the producer, and the type of livestock that the predators attack. For some rural producers, the impact of a predator attack can devastate the economy of the family, while for more technified producers —who own extensive properties and, therefore, a higher number of cattle— predation losses are not a catastrophic event (Peña-Mondragón *et al.*, 2016).

Losses caused by a deficient livestock management (health, starvation, accidents) are usually higher than predation losses (Hoogesteijn *et al.*, 2014). However, cattle owners are usually less tolerant to predator attacks than to other kind of losses, such as sickness or rustling; consequently, ranchers decide to eliminate the predator (Hoogesteijn *et al.*, 2014).

In order to intervene in the conflict between wild carnivores and ranchers, Mexico implemented the Seguro de Ataque por Depredadores (SAD). This program "protects the death and/or forced slaughter of breeding, dual purpose, milking, and working cattle, as well as breeding goats and sheep, horses and pigs, when their deaths are caused by predator attacks" (CNOG, 2021).

Although it came into force in 2006, SAD has had varied regional results. However, its effectiveness in reducing the death of wild predators has not been evaluated. Additionally, there is a lack of information about what ranchers think about this strategy. This situation limits the scope and effectiveness of this strategy.

Among other factors, the overall perception of people towards a species or a subject is measured by their values, attitudes, personality, age, gender, education, employment, religion, socio-economic status, and cultural heritage (Lazos and Paré, 2000). These factors are in constant flux, because they depend on the context and experiences in which they were created (Durand, 2008).

Consequently, the objective of this work was to evaluate the operation and effectiveness of the livestock insurance fund, offered in case of a predator attack against livestock. This evaluation should take into account the perception of the ranchers of the Calakmul region, Campeche, Mexico, where there are constant reports about wild predator attacks against cattle. This work suggests changes for the local implementation of the SAD.

MATERIALS AND METHODS

Study area

The Calakmul Biosphere Reserve (RBC) is located within the Yucatan Peninsula, in southern Campeche, and it has an area of 723,185.12 ha (INEGI, 2019). It is part of the Gran Region of Calakmul (Figure 1), which includes the Maya Biosphere Reserve in Guatemala and the preservation area of the Rio Bravo Dos Milpas in Belize. The RBC has a warm and subhumid climate (Aw) and a 24.6 °C annual mean temperature. Its highest m.a.s.l. is located in the Champerico hill (390 m); the minimum m.a.s.l. varies from 100 to 150 m. The predominant types of vegetation are medium semi-evergreen forest, medium semi-deciduous forest, and semi-deciduos lowland forest (Martínez and Galindo, 2002). Several productive activities are carried out in the area of influence of the RBC, such as agriculture, beekeeping, timber harvesting and non-timber forest harvesting, tourism, and livestock raising. Livestock raising leads to the coexistence between producers, wild carnivores (in particular, jaguars), and their habitat.

Information gathering

A structured interview was used to open the conversation with the inhabitants. An interview with the ejido representatives and livestock associations leaders was carried out in order to confirm the existence of problems between wild life and the inhabitants (Rodríguez-Calderón *et al.*, 2018).

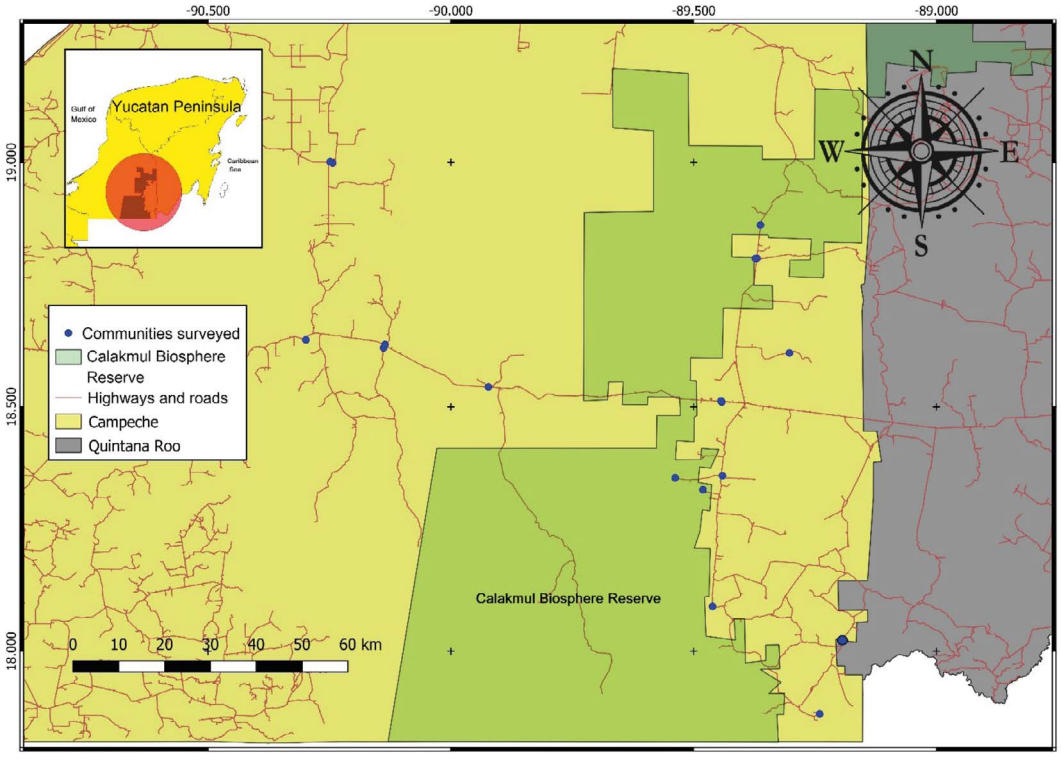

Figure 1. Location of the communities (blue circles) where the study was carried out. Calakmul Biosphere Reserve, Campeche, México.

Study area selection

Literature research was carried out in order to gather information about the conflict between producers and wild predators. The aim was to conduct surveys in communities located within the area of influence of the Calakmul region, in order to identify aspects related to the SAD. Subsequently, the communities were visited with the authorization of the ejido and municipal authorities, with the aim of informing them about the rancher-focused surveys. In order to identify producers in the communities under study, data from Sistema Nacional de Identificación Individual del Ganado (SIINIGA) and the data provided by the RBC —which has been gathering predation reports for years (Simá-Pantí, TBP)— were analyzed.

Based on the data provided by the producers, informants who have livestock in their property were selected from each community. Several factors were taken into account: age, time of residence in the community, awareness about the livestock activity processes, and natural resources.

A total of 70 surveys were conducted with ranchers of 18 communities from the area of influence of the RBC. Communities were divided in three groups: northern, central, and southern areas. In order to conduct the surveys with ranchers, a snowball method was used. This method consists of locating some individuals, who, on their turn, lead to others, and so forth, until enough samples are gathered. Categories included aspects such as awareness about the SAD, telephone numbers to report incidents, best known diffusion methods, perception about the benefits, how to report incidents, how long it takes for the technician to arrive, assistance provided by the technician, money paid for the predated animals, where and when more talks were given, and finally, what actions they would take if the SAD disappeared.

Data analysis

After the surveys concluded, all the gathered data was input and analyzed in a systematic way, using an Excel® sheet. Those who had been impacted by predation and those who have reported predation incidents to the SAD were identified. The data was analyzed per region, in order to understand how the service was provided to the Calakmul region.

A qualitative analysis was conducted. This methodology has been tested in several socioenvironmental studies (Hernández *et al.*, 2006). Based on the producer answers, a percentage of representativeness was obtained for each question of interest (Rodríguez-Calderón *et al.*, 2018). The properties of the interviewees were georeferenced with the help of the *ejido* commissioners, using the maps developed by the National Institute of Statistics and Geography (INEGI, 2019) for the National Agrarian Registry (RAR). If the common use properties of the *ejidos* were georeferenced, only a single point was taken into account.

RESULTS AND DISCUSSION

Based on the information obtained from the surveys, awareness and perception about the SAD were identified per region. The surveys were carried out as follows: 15 surveys in 6 communities of the northern region (1 woman and 14 men); 34 surveys in 7 communities of the central region (3 women and 29 men); and 23 surveys in 5 communities of the

southern region (3 women and 20 men) (Table 1). Out of the 70 ranchers, 56% (n=39) came from other states (Chiapas, Michoacan, Oaxaca, Quintana Roo, Tabasco, and Veracruz) and 44% (n=31) are from Campeche.

Regions Communities Women Men Total surveys

Most of the ranchers attended junior high school (n=36), followed by those who have no schooling (31%), incomplete primary school (17%), primary school (9%), high school (6%) and incomplete junior high school (1%).

Awareness about the predator attack insurance

Most of the ranchers (70%) from the communities located in the northern, central, and southern regions of the area of influence of the RBC are aware about the predator attack insurance. The central region (Xpujil and Constitución) had more (2) livestock associations than the other regions. In the northern communities, the diffusion methods included three-page leaflets and posters (Figure 2). Meanwhile, the central communities mentioned that there are others diffusion methods, such as talks with fellow producers, SINIIGA, RBC, and NGOs (for example, Pronatura Península de Yucatán (PPY) and the World Wildlife Fund (WWF)). The southern communities also mentioned talks from various institutions. In the northern communities, the less known diffusion methods included talks and other type of advertisement, while in the central communities, radio spots were mentioned. In the southern communities, radio spots and posters were also mentioned as the less known

Table 1. Communities where the surveys were conducted.

Regions	Communities	Women	Men	Total surveys
North	Akimpech	0	1	1
	Nueva Vida	0	3	3
	Nuevo Becal	1	3	4
	Pablo García	0	2	2
	Refugio	0	4	4
	Chilam Balam	0	1	1
Central	Centenario	0	1	1
	Nuevo Conhuas	3	7	10
	Constitución	0	14	14
	Heriberto Jara	0	2	2
	La Guadalupe	0	2	2
	López Mateos	0	3	3
South	Valentín Gómez Farías	0	2	2
	Centauro del Norte	0	5	5
	Justo Sierra Méndez	1	1	2
	Manuel Castilla Brito	0	1	1
	Once de Mayo	1	9	10
	Santa Rosa	1	2	3
		7	63	70

Figure 2. The interviewees mentioned that the information about the predator attack insurance was received from different methods, including talks, leaflets, and posters. Figure 2a shows the FAG and the RBC personnel giving in-person talks to a community in Calakmul. Figures 2b and 2c show examples of the posters used to spread information about the predator attack insurance.

methods. Most of the ranchers said that they are unaware of the SAD's telephone numbers. Sixty-eight percent of the central communities is unaware of how the SAD operates. Only 12 producers from the central communities mentioned that they know how SAD operates; this figure is almost the same in the southern region (n=12). Ranchers are not satisfied with the payment given for breeding males. Fifty-six percent of the ranchers mentioned that SAD has beneficial effects, 28% said they are not aware of its potential benefits, and 13% think that SAD does not have beneficial effects.

Talks about the predator attack insurance (SAD)

Sixty-four percent of the ranchers mentioned that they had never attended talks about the SAD. None of the ranchers from the northern region mentioned attending talks in 2012, 2014, and 2019. The ranchers from the central region did not attend any talk in 2012, 2015, and 2019.

Ranchers who were assisted by the SAD

Only 27% of the interviewed ranchers have reported attacks to the SAD and have obtained a compensation for their losses; the remaining 73% did not comply with the policies, because several reports were filed after the 72-h deadline; therefore, they were not provided with an advisory number and, consequently, never obtained a response. Eighty-eight percent of the ranchers that were assisted by the SAD mentioned that its response to predator attacks was immediate; 6% mentioned that the response was not immediate, while the remaining 6% mentioned that the response time was variable. Thirty-five percent of the ranchers have reported the incidents to the RBC and they mentioned that making a call was an important factor to obtain the SAD's support. All the ranchers interviewed in this study mentioned that their livestock have been attacked

by predators; however, only 27% have reported the incident to the SAD and have received the compensation for their losses. Eighty-eight percent of the ranchers mentioned that they had received an immediate response from the SAD technician. Fifty-three percent of the ranchers said that the SAD technician had a good attitude, while 47% said that it was excellent.

Ninety-one percent of the area of distribution of the jaguar is outside the protected natural areas; therefore, programs must be developed to reduce the conflict between jaguars and humans (predation), in order to guarantee a reduction of retaliatory killings.

The results obtained in this study show that most of the ranchers (70%) have been aware about the existence of the SAD for several years. Fifty-four percent are not aware of how the mechanisms and the procedures to obtain the SAD's assistance in the field work.

SAD fulfills its assistance policy function sending an adjustor to the field; the adjustor works with the concerned party and/or beneficiary in a timely and proper manner. Additionally, thanks to the support of the RBC/CONANP technical personnel, most of the complaints generated during a year can be solved. However, this is an informal support: there is no formal agreement regarding this activity. If a formal agreement were in place, a more effective assistance could be offered in case of predator attacks. Therefore, ranchers perceive that the SAD is only a temporary palliative. Nevertheless, it is also a strategic plan to reduce their anger and the subsequent retaliatory killings of carnivores —particularly jaguars, which are included among the endangered species (NOM-59-SEMARNAT-2010; SEMARNAT, 2010).

The RBC head office and several NGOs have supported ranchers in the Calakmul region to carry out preventive measures against predator attacks. They have also trained producers in order to improve their livestock herds and to obtain a higher production. This training included grazing management, grass silage, electrical fences, and how to gather information in the field.

The RBC head office also plays a fundamental role in the management of the jaguar-rancher conflict through a biological monitoring. This activity includes the monitoring carried out by groups trained by the RBC. Additionally, it collaborates with NGOs to provide several financial support strategies for the communities, in order to implement mitigation measures (such as electrical fences), reducing the predation risk.

Thirty percent of livestock losses in Calakmul result from diseases (Figure 3). This is a very common problem among rural communities, as a consequence of the lack of technical training and appropriate management programs (Iftikhar *et al.*, 2009). Just like in other areas (Iftikhar *et al.*, 2009), if time and resources are invested in order to improve livestock health management and to reduce deaths caused by diseases, productivity would improve and, at the same time, the proportional impact of predation would be reduced. Extensive management makes it difficult to accurately identify the species of predators, as well as to make an appropriate evaluation of the causes of death. Although the interviewees hold jaguars and cougars (*Puma concolor*) accountable for most of the attacks, it is important to bear in mind that, according to the SAD's regional data, the number of cases that received a compensation for jaguar or cougar attacks is lower than those received for wild dog attacks (CNOG, 2021).

Figure 3. Sheep in a typical safeguard stable. Animals are in a severe malnutrition state. Diseases account for a high percentage of the deaths in herds located in the Calakmul region, Campeche, Mexico.

Most of the attacks took place at night, which matches the findings of Zarco-González *et al.* (2012) and other studies (Figure 4). This is important because, a very useful measure to reduce losses in small herds is to protect the animals at night, just like some of the interviewees mentioned in this study.

A sense of justice and injustice can be clearly identified in the perception that ranchers have about the SAD. This is not only the result of the costs and benefits of livestock raising, but also of the management of jaguars and their livestock. The effective and friendly assistance helps the SAD to build a better link with the livestock sector and the community. Most of the ranchers acknowledged the inherent right to life, of the survival of carnivores, and the importance of their survival for future generations (their children). Even more important, we discovered alternative narratives that are currently been distributed by the conservationists of Calakmul. For instance, even those ranchers who have been impacted by predator attacks and the subsequent losses, reaffirmed the right of wild carnivores to life.

Figure 4. Cougar captured by a tramp camera, while killing a sheep in a livestock plot, in the Centauro del Norte ejido in the Calakmul region, Campeche, Mexico. Source: Animal Karma/WWF Mexico.

Additionally, people shared the same perception about procedural justice and they clearly distinguished among justice criteria. For them, the payment or compensation provided by the SAD is a temporary and effective element of justice that takes into account the justice of not killing wild carnivores.

CONCLUSIONS

Ranchers from the Calakmul region are aware of the SAD. They have been assisted and, in several cases, have benefited by some strategies established in the area by the RBC or the NGOs which actively work in the region. The SAD is an effective tool to reduce the anger of the producers towards wild carnivores. Sometimes it allows local technicians to dig deeper in order to implement some non-predatory strategies, such as the establishment of electrical fences.

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REFERENCES

CNOG, (2021). *Seguro de muerte por taque de depredadores*. Confederación Nacional de Organizaciones Ganaderas. Recuperado el 9 de mayo de 2022, de CNOG: https://fondocnog.com/seguros/muerte-por-ataque-de-depredadores

Hernández S. R., Fernández C. C., Baptista L. P. (2006). *Metodología de la investigación*. McGrawhill internamerica. Mexico. 850 p.

Hoogesteijn, A. L., López, C. A., Núñez, R., Rosas-Rosas, O., & Febles, J. L. (2016). *El jaguar y las comunidades rurales. In*: Conflictos entre felinos y humanos en América Latina, Castaño-Uribe, C., Lasso, C. A., Hoogesteijn, R., Diaz-Pulido, A., & Payán, E., Eds.; Serie Editorial Fauna Silvestre Neotropical: Bogotá, D. C., Colombia. 489 p.

Hoogesteijn, R., Hoogesteijn, A. L., & Tortato, F. (2014). *Peligrosidad del jaguar para los humanos ¿Realidad o exageración? In*: Simposio Internacional Conservación de Felinos en América, Sarapiquí, Costa Rica, 23-26 de mayo; pp. 8-9.

Iftikhar, D. N., Aziz, M. R., Zaman, Q. Q., & Linkie, M. (2009). Predicting the patterns, perceptions and causes of human–carnivore conflict in and around Machiara National Park, Pakistan. *Biological Conservation, 142*(10), 2076-2082. https://doi.org/10.1016/j.biocon.2009.04.003

INEGI. 2019. Anuario estadístico y geográfico por entidad federativa 2019 / Instituto Nacional de Estadística y Geografía. México: INEGI, c2019. Estado de Campeche. www.inegi.gob.mx. 631 p.

Lazos, E., & Paré, L. (2000). *Indigenous views on a "saddened" nature: Perceptions of environmental degradation among Nahua of southern Veracruz*. UNAM: Ciudad de México, México. 220 p.

Martínez, E., & Galindo, L. C. (2002). La vegetación de Calakmul, Campeche, México: Clasificación, descripción y distribución. *Boletín de la Sociedad Botánica de México, 1*(71), 7-32.

Núñez-Pérez, R., Saracho-Aguilar, E. E., Anguiano-Méndez, D., & Juárez-Ochoa, I. (2020). *El jaguar en el Antropoceno*. *In*: Manejo y conservación del jaguar en la Reserva de la Biósfera Sierra del Abra Tanchipa, Rosas-Rosas, O. C., Silva-Caballero, A., & Durán-Fernández, A., Eds.; Colegio de Posgraduados: Montecillo, Texcoco, Estado de México, México. Pp.35-60.

Peña-Mondragón, J. L., Castillo, A., Hoogesteijn, A., & Martínez-Meyer, E. (2016). Livestock predation by jaguars *Panthera onca* in South-Eastern Mexico: the role of local peoples' practices. *Oryx, 51*(2), 1-9. http://dx.doi.org/10.1017/S0030605315001088

Rodríguez-Calderón, Y. G., Contreras-Moreno, F. M., Segura-Berttolini, E. C., Bautista-Ramírez, P., & Jesús-Espinosa, D. (2018). Análisis del conflicto entre la fauna silvestre y productores rurales en dos comunidades de Balancán, Tabasco, México. *Agroproductividad, 11*(6), 51-59.

Rosas-Rosas, O. C., & Valdez, R. (2010) The role of landowners in jaguar conservation in Sonora, Mexico. *Conservation Biology, 24*(2), 366-371.

SEMARNAT. (2010). *Norma Oficial Mexicana NOM-059-SEMARNAT-2010, Protección Ambiental –Especies nativas de México de flora y fauna silvestres– Categorías de riesgo y especificaciones para su inclusión, exclusión o cambio – lista de especies en riesgo*. Diario Oficial de la Federación. 30 de diciembre de 2010, Segunda Sección. México, D. F.

Zarco-González, M. M., Monroy-Vilchis, O., & Alaníz, J. (2013). Spatial model of livestock predation by jaguar and puma in Mexico: conservation planning. *Biological Conservation, 159*, 80-87.