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GUANO USE AND HABITAT MANAGEMENT OF BAT POPULATIONS IN THE DRY TROPIC. A STRATEGY IN THE SELF-DEVELOPMENT OF THE EJIDO HUATZIRAN

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Abstract: The study was carried out in the Zicuirán-Infiernillo biosphere reserve of the Huatzirán ejido, La Huacana municipality, Mich. The physiography is rugged; The geology is sedimentary and igneous rocks; The volcanic devices have formed caverns of various shapes, in which important bat populations live in the ejido due to the use of guano. The problem lies in the looting of guano carried out by people without considering the habits of the species and especially of the offspring. The objectives were to characterize the habitat, the use and define the management plan for the biological communities. The research was participatory, since caves and the preparation of products derived from guano were monitored. 21 caves were located in various conditions in the area and the species of bat found is ***Eptesicus fuscus***, from the frugivorous and insectivorous group; The amount of guano on average exceeds 1000 kg/year; The market and demand for these products is broad. Guano is a good nutritional option of organic origin for short-cycle crops, due to the high content of microorganisms.
Keywords: Habitat management, bat populations, characterization of caves and guano or bat dung.

INTRODUCTION

Bats are one of the most important pest controllers for agriculture. Each feeds on about 10 grams of insects each night. If we put this into arithmetic, every million bats destroy 10 tons of insects every night, of which between 60 and 70% are agricultural pests. If all the insect-eating bats in the country disappeared, in three months we would have no crops. It is the best pesticide there is, in addition to being non-polluting, it produces one of the richest fertilizers that exist in the world, it is known as bat guano.

González (2005) also reports that there are 1100 species in the world, these species are divided into two types, the large ones or Megachiroptera and the small ones or Microchiroptera. Megachiropterans are found in Australia, Asia, Africa, that is, exclusive to the Old World; while the small ones occupy countless habitats throughout the planet. Among the large bats are the flying foxes, whose wingspan can reach 1.50 m, while in the small ones there is a species that can weigh 2 grams and be much smaller than a thumb.

Arguero and Albuja (2011), bats inhabit cloudy and evergreen forests at an altitude greater than 1500 meters above sea level. Their shelters are found in hollow trees, small caves or man-made structures.

They can live in hollow logs, rock crevices, abandoned houses, and other places, but are usually associated with caves, where they live in colonies of thousands and even millions of individuals.

The objectives of this study were: Locate the refuge sites for bat populations in the ejido's land endowment, characterize the habitat of the bat populations and the conditions they present due to the disorderly extraction of guano, identify the bat species that are located and that form guano banks, evaluate the potential of the bat guano banks produced in the refuge sites and propose a management plan for the bat refuge areas, the use of the guano banks and the process of transformation, which allows the generational protection and conservation of species.

MATERIALS AND METHODS

In the ejido assembly, the need for participation of the ejidatarios was discussed and the technical team of the ejido was defined, with whom diagnostic and field work workshops were carried out. The objectives of the study for the production of biofertilizer for forest ecosystems were announced, as an alternative to make the use of forest ecosystems more efficient and diversified, through

talks that were held with older ejidatarios. Due to their knowledge of the places, they were able to locate the bat caves. The caves were georeferenced, labeled, marked and a description of the natural conditions they present was made.

The caves were classified by size into large, medium and small. For each cave, the surface area with evidence of bat dung was calculated, with a total surface area of 2405 m2 and 11 were chosen for sampling in 225 m2 (4 large, 4 medium and 3 small), equivalent to 52.3%. The large ones were sampled at 10% and the medium and small ones at 100%. The monitoring consisted of placing black plastic on the floor, secured with stones to avoid being dragged or moved. Every month, the manure accumulated in the plastics was collected with an ixtle brush, rolling and removing the plastic from the caves in the case of large and medium-sized caves. In the small caves, the manure was packaged right there in plastic bags. plastic, avoiding making as little noise as possible. The packages were weighed on a precision scale and labeled. This activity was repeated for 4 months, which made it possible to quantify the manure banks produced during this period and estimate the utilization rate during the year. To access the caves and collect the manure, special equipment and material was used for the protection and safety of people and to avoid disturbing the bats. The caves and surrounding dispersion areas were characterized in terms of their environmental variables of the physical and biological environment, applying conventional transect sampling and appropriate equipment. A bibliographic review was carried out and surveys were applied to the locals. The market study was carried out in the region by selecting producers with experience in agricultural and fruit activities, applying a questionnaire to define the relevance and feasibility of the project. The instruments applied consisted of the participation of the group of ejidatarios, neighboring residents, review of documents, interviews with travelers, observation and analysis, filling out forms, taking photographs and Internet pages. With field work and documentary information, the management plan, use and preparation of products to be prepared using guano from a sustainable approach was defined, Figure 1.

Figure 1: Placing plastics, obtaining manure and collecting production data in the caves.

RESULTS AND DISCUSSION

DESCRIPTION OF THE PHYSICAL ENVIRONMENT OF THE STUDY AREA

The ejido lands are 7088.82 ha, according to the Presidential Resolution of 1939, with a register of 87 ejidatarios (PROCEDE, 2005), dispersed in seven rancherías: Huatzirán, el Naranjo, el Recodo, las Joyas, el Chauz, la Pastoría and el Guava.

In 2007, the Decree of the Zicuirán-Infiernillo Biosphere Reserve of 265,118 ha was published and Core Area 1 with 2550 ha is located in the ejido, Figure 2.

PHYSIOGRAPHY

The ejido has a steep relief, with elevations of 200 to 1,000 meters above sea level and small extensions of alluvial plains located between 200 and 350 meters above sea level, slopes greater than 15% dominate, 53% of the total surface is within this range. and only 22% is slightly flat, in which agricultural activities. The highest elevations are the hills Otatera and Ventura (1000 meters above sea level) and La Trucha, Monte Prieto and Trencillas (850 meters above sea level); Other elevations lower than 600 meters above sea level are the hills of La Manga, Machete, Tinajita, Cuachalalatera, Peinado and Apollladores, Rzedowski, (1978).

CLIMATE

The climate is warm dry INEGI (1985), it is classified as Semi-dry very warm BS1 (h') W (w); with an average annual temperature greater than 22 °C and the coldest month is 18 °C; thermal oscillation of 5 to 7 °C; rains in summer and less than 5% rain in winter.

GEOLOY

Chronostratigraphy is located in the region of sedimentary rocks of marine origin with remains of animals and plants, which are found bordering the river.

Rafts; Another type of rocks are igneous rocks of different ages in the Huacana region, where intrusive igneous rocks predominate, represented by diorites, sendites and granites, intrusive igneous rocks also developed, represented by andesites, rhyolites and basalts. In the La Huacana municipality, basalts and basaltic volcanic breccias from the Quaternary period are widespread (Arias, 1997), INEGI (1985), Figure 3.

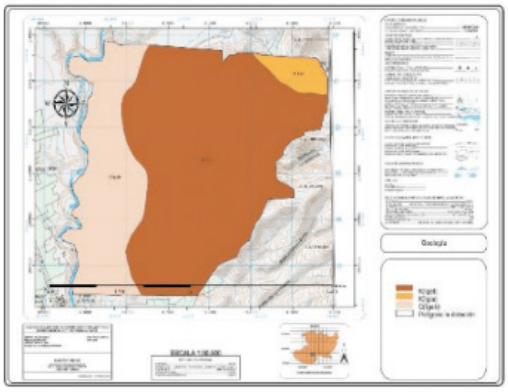

Figure 3: Geological composition of the study area

SOIL

The most widely distributed soil unit is Litosol, with a depth of less than 10 cm; Basaltic rocks dominate as parent material, locally known as "stony"; It is found from the high parts, on slopes and plains by 73%; Eutric Regosol is a thin soil developed on unconsolidated materials, sometimes with the presence of gravel or gravel; It is distributed along the Pastoría River, occupying an area of 25.1%, Buol et al, 1981.

DESCRIPTION OF THE BIOLOGICAL ENVIRONMENT OF THE STUDY AREA

VEGETATION

The low deciduous forest, low forest with arborescent cacti, low thorny forest and relicts of medium sub-deciduous forest are present. A pronounced dry season is characteristic, reflected in the density, physiognomy and structure of the vegetation, the height of the trees is 5 to 20 m, crowns with a diameter of 4 to 10 m, from March to May the vegetation is bare and At the end of the drought some species dress with brightly colored flowers; The vegetative period is quickly reactivated with the first rains, at the beginning of June. 80 species of importance for ecological uses and functions were recorded in the tree stratum, 9 in the shrub stratum and 20 in the herbaceous stratum. The columnar cacti found are pachón, pitire, old man's beard and nopales, Figure 4.

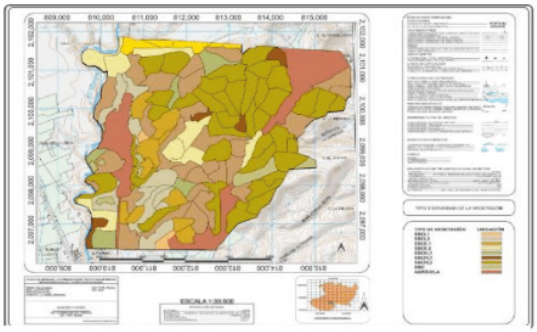

Figure 4: Composition of the vegetal strata

WILDLIFE

There is a great wealth of fauna made up of mammals, reptiles, amphibians and birds. From the list of species, reptiles and amphibians observe a greater number of species in status of the categories indicated in NOM-059-SEMARNAT-2001, since they have been overexploited, are endemic or their habitat has been destroyed. Of 27 registered herpetozoan species, 14 (52%) are listed in said Standard, 4 in the threatened category, 10 in the category subject to special protection and 18 (67%) are endemic to Mexico. The richness of birds, considering the recorded species and those of potential occurrence, is 101 species, grouped into 13 orders and 30 families. In the case of mammals, 76 species grouped into 8 orders and 21 families were located.

TAXONOMIC CLASSIFICATION AND DESCRIPTION OF THE BAT SPECIES

According to P. Beauv 1796, the mammal species Eptesicus fuscus of taxonomic classification is presented:

Animalia Kingdom

Edge: Chordata

Class: Mammalia

Order: Chiroptera

Suborder: Microchiroptera

Family: Vespertilionidae

Gender: ***Eptesicus***

Species: ***fuscus***

Common name: Brown bat, Figure 5.

DISTRIBUTION AND HABITS OF THE SPECIES

Distribution: The brown bat, ***Eptesicus fuscus*** is a species of bat that lives from southern Canada to Colombia and northern South America and the Antilles, at less than 2,700 meters above sea level and very common in human settlements.

Figure 5. Characteristics of the species: Eptesicus fuscusof bat found in the study area.

According to CONABIO, this species of mammal is located in almost the entire Mexican Republic and in a large part of Michoacán, it is considered of great importance to maintain ecological balance and biologically combat outbreaks of insects that could be harmful to agriculture. in addition to being a potential species for the production of guano biofertilizer.

Behavior: It is a nocturnal species that rests during the day, in tree holes, in rock crevices or in artificial structures such as attics, old buildings, ailerons and blinds. Navigate through the night skies using Echolocation: It consists of the emission of ultrasounds (in red) that reach the object (in blue) and are reflected in the form of an echo (in green), returning to the bat, which calculates the distance (r) based on the time elapsed between emission and reception. They deduce the direction from the difference between the echo arriving at the right ear and the left ear, Figure 6.

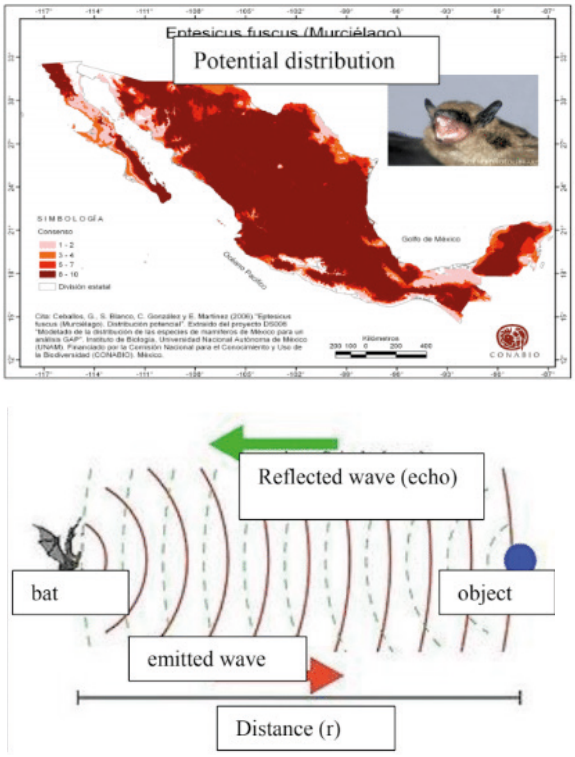

Figure 6: Bat night flight echolocation image.

Lazzaro Spallanzani discovered in 1793 that they became disoriented if they could not hear, but that they avoided obstacles when they were blinded. In 1920, the English physiologist Hartridge pointed out the possibility that they located and captured their prey with their hearing. Already in 1938, with the development of a microphone that captured high frequencies, Donald Griffin discovered that bats emitted ultrasound.

Its main predators are owls, boas, wild cats, domestic cats, opossums, hawks and other carnivorous bats.

Feeding: It is insectivorous, eating many types of nocturnal flying insects, such as mosquitoes, moths, beetles, wasps, which it captures in flight. This makes changes in direction sudden and frequent. Given their mostly nocturnal habits, when insectivorous birds are inactive, bats have no competition to hunt the large number of insects that come out after sunset.

Reproduction: Looks for a partner sporadically to mate from November to March. Afterwards, the pregnant females separate and form maternity colonies that gather between 5 and 700 individuals. The males rest apart, alone or in small groups, during this time. Normally they have only one offspring per female per year, but in the tropics it is common for some species to have two reproductive periods. The pair of bats come together through visual, olfactory and sound signals and copulation occurs, which is from behind, Table 1.

EVALUATION OF THE PROBLEM

In the common lands there are a large number of caves where brown bats of the species Eptesicus fuscus live. It is an insectivorous bat, as it eats many types of nocturnal flying insects, as mentioned above. These mammals form colonies in caves, mostly on the left bank of the La Pastoría River bank. The main problem is the constant looting of guano production by people outside the ejido who enter the caves without permission to extract the guano and sell it in the neighboring towns of Nueva Italia, Apatzingán, la Huacana, Uruapan, among others, as organic fertilizer to nourish mango, lemon or avocado crops; Such looting was confirmed in the field trips that were carried out to the location of the caves where remains of sacks that were used to package and transport guano, soft drink containers, water and cookie bags and many disposables were found. The people who dedicate themselves to looting guano are unaware of the habits of the mammal, who when collecting it do so without any care or respect for the animal, which is nocturnal and the collection of guano is carried out during the day, a time in which the animals. They use them for rest and sleep.

No matter how harmless the intensive practice of this activity may seem at first glance, it has disastrous results for bat populations. The mere presence of people causes stress in the bat colony. Furthermore, during the nursing season, it is common for mothers, fleeing from visitors, to drop their babies on the ground, where they generally die. Due to this type of disturbance, bat colonies can become smaller and smaller.

The size of the bat population inside the caves is a factor of great importance, since it contributes to maintaining an adequate temperature and the bat is not forced to expend energy to maintain body temperature.

This does not mean that the caves must not be visited, but it must be done with the necessary preventive care to reduce the disturbance that occurs to a minimum. Caves with significant colonies of bats must be visited as little as possible and must be avoided other than during the reproductive season, which occurs between April and September.

When visiting caves with bats, the stay in the chambers inhabited by them must be limited to the shortest possible time.

The use of campfires, shining direct light on the bat beyond what is essential or making unnecessary noises and avoiding the use of a flash must be avoided.

It is important to remember that bats are the only major group of nocturnal insect predators. This means that the annoyance caused by the hordes of mosquitoes, termites, moths and other insects that plague residences at night would probably reach unbearable levels if it were not for the activity of bats.

CHARACTERIZATION OF THE CAVES

The characteristics and distribution of caves in the study area of the Huatzirán ejido are presented in Table 2, Figure 7.

Months	E	F	M	A	M	J	J	A	S	O	N	D
Mating	X	X	X								X	X
Birth and breastfeeding			X	X	X	X	X	X	X			

Table 1: Biological events

Cave	Place	Pending %	Exposure	Land use	Coordinates	Asnm	Surface (m^2)	Sampled sup (m^2)	Re-collection (Kg)	Weight/ month (Kg)
1	Copalitos	10	S	Agostadero	N18°58'32.4" W102°03'09.1"	305	75	8	0.32	3.05
2	El Pitayo	45	SW	Agostadero	N18°58'40" W102°03'15.9"	315	75	8	0.41	3.89
3	Ventana Valle Nuevo	40	SW	Agostadero	N18°58'40.5 W102°03'15.5"	310	80	12	0.28	1.90
4	Valle Nuevo	40	SW	Agostadero	N18°58'40.2" W102°03'15.9"	293	120	16	0.15	1.13
5	Ventana de Valle Nuevo IV	30	NE	Agostadero	N18°58'48.5" W102°03'19.3"	299	250	8	0.28	8.91
6	La negra	30	W	Agostadero	N18°58'12.6" W102°03'09.2"	291	500	10.5	0.20	9.52
7	Corralitos	30	W	Agostadero	N18°58'13.8" W102°03'08.9"	293	150	9	0.30	5.0
8	La loma	25	W	Agostadero	N18°58'12.2" W102°03'15.8"	289	225	20	0.30	3.38
9	La loma 2	25	SW	Agostadero	N18°58'13.9" W102°03'17.2"	287	40	4.5	0.30	2.67
10	La loma 3	25	W	Agostadero	N18°58'23.1" W102°03'18.5"	294	160	16	0.40	4.0
11	La loma 4	20	E	Agostadero	N18°58'29.1" W102°03'17.7"	302	120	6	0.30	6.0
12	Corralitos	20	SW	Agostadero	N18°58'12.7" W102°	290	120	10.7	0.29	3.30
13	Cruz de Calixto	25	SW	Agostadero	N18°57'57.6" W102°03'18.1"	293	100	10.7	0.29	2.75
14	La Joya-Coruquito	30	SW	Pastoreo	N18°56'56.2" W102°03'23.6"	266	80	10.7	0.29	2.20
15	Ventana de Valle Nuevo II	35	NW	Agostadero	N18°58'42.4" W102°03'16.5"	321	74	10.7	0.29	2.04
16	El peinado	35	SE	Agostadero	N18°58'02.5" W102°01'45.6"	242	60	10.7	0.29	1.65
17	La Loma II	30	NE	Agostadero	N18°58'23.9" W102°03'19.3"	320	50	10.7	0.29	1.37
18	Cruz de Calixto	30	W	Agostadero	N18°58'08.6" W102°03'10.7"	296	45	10.7	0.29	1.24
19	Cruz de Calixto II	25	W	Agostadero	N18°58'07.8" W102°03'10.4"	287	40	10.7	0.29	1.10
20	Valle Nuevo	35	NW	Agostadero	N18°58'48.8" W102°03'20.6"	318	27	10.7	0.29	0.74
21	Ventana de Valle Nuevo III	35	NE	Agostadero	N18°58'44.2" W102°03'16.7"	277	105	10.7	0.29	2.89
	TOTAL						**2405**	**225**	**6.26**	**66.5**

Table 2. Characteristics and production data of the caves

Activity	**E**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**Production kg/year**
Guano collection			x	x	x					x			798
Biofertilizer production			x	x	x					x			2394

Table 3. Period of greatest use of guano

USE OF GUANO

The period of greatest use of guano is in the months of March to May and October, Table 3, so as not to affect the colonies.

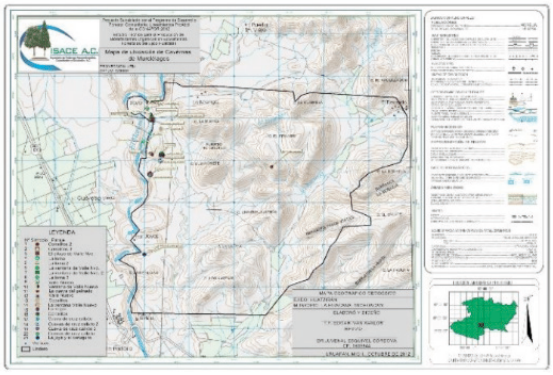

Figure 7. Geographic location of the guano caves in the study area.

DEMAND FOR PRODUCTS

The demand for products in recent years has experienced an increase, people increasingly require and look for alternatives that help them produce more without harming the environment, which is why the option of using organic products is becoming more and more necessary.

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THE PRODUCT OFFERING

The need to protect the environment in Mexico and in the world is becoming more and more necessary, which is why the development of projects of this type seeks to mitigate the environmental impact caused by the chemical products that are applied each year for the agricultural production. In Michoacán, through the PRONAFOR support program, several development complexes have been supported with these items in ejidos and communities. This project becomes part of said strategy and is integrated into the general scheme of strategic self-development proposed by the ejido.

PROJECT EVALUATION

The evaluation of the project was done from the following approaches:

ECONOMIC-FINANCIAL APPROACHES

In this section, a review was made of the "financial evaluation of the biofertilizer production project", of its economic and financial indicators, made its calculation and present existing mechanisms to obtain them, as an essential basis for making decisions on investment projects of this type.

According to the calculations of the economic indicators, an update rate of 7% stood out; these results are shown in Table 4.

INDICATOR	VALUE	DECISION
B/C	1.34	Accepted
VAN	151,389	Accepted
TIR	45%	Accepted

Table 4. Economic indicators for decision making

ANALYSIS FROM OTHER APPROACHES

SOCIAL FOCUS

In addition to measuring the impact of a project on consumption, savings and deserving goods, it identifies and values the effect of the project on the distribution of income and wealth, Table 5.

Concept	Project activity	Jobs	Tillage time	Monthly investment
Technical advice	Training and orientation Management	1	Two visits per month	$ 4500
Gatherers	Extract guano manure	4	Once a month	$ 1600
Product preparation	Product preparation	3	Once a month	$ 1800
Product finish	Packing	3	Once a month	$ 1500

Table 5. Deferred investment in technical assistance, administration and maintenance

ENVIRONMENTAL APPROACH

In recent years, many important projects have encountered serious difficulties because in the design and implementation stage, their relationship with the environment that surrounds them has not been sufficiently taken into account. Some projects have been deemed unsustainable due to resource depletion, others have been abandoned due to public opposition, many have run into financial problems due to unforeseen costs, and others have faced lawsuits for damage to natural resources and even accidents.

Environmental impact assessment studies are a management tool for project managers and government agencies, used to identify, predict and evaluate potential environmental impacts that could cause such problems. Thanks to these studies, projects can be improved by incorporating measures to control environmental problems from the first stages of the proposal, Table 6.

ENVIRON-MENTAL COMPONENT	MEASURES OF:	
	PREVENTION	MITIGATION
WILDLIFE	- Prolonged periods of activities that generate noise will be avoided, especially during mating season. Prohibit the persecution, capture and hunting of the bat species: ***Eptesicus fuscus.*** - Do not leave garbage or other contaminants inside the caves. - Do not destroy the forest surrounding the caves and alter the environment.	- Bring the right equipment. - Just enter to collect the manure and immediately leave the caves. - Send only trained personnel. - Place signage near the caves.

Table 6: Prevention and mitigation measures for identified environmental impacts

CONCLUSIONS

The vast majority of bats that exist in Mexico and in the world are harmless and the benefits they provide us through their unconscious task of maintaining the ecological level are even greater than we imagine. Therefore, although they are not beautiful or aesthetic, we must conserve them as part of this planet that we take so much from and give so little to and not get carried away by those primitive beliefs about this wonderful species.

Bat guano is presented as a good nutritional alternative for fertilizing short-cycle crops planted on the substrate made up of 10% of the material, given the high content of microorganisms capable of improving their fertility, in addition to guaranteeing a good availability of nutrients for plant development.

The residents of the exploitation area are currently aware of the essential role that the community plays in the natural resource of bush vegetation at different energy levels and in the food chain, which is why cutting down or dismantling this resource is avoided.

They have also understood that it is not

possible to sustain development without taking into account the population dynamics of the resources they use. Special attention is required not to harm the species found in the area due to their importance and the micro habitat in which we can find them.

It is concluded that, if the project respects the respective protocol guidelines and these guidelines, it will be highly viable, from an economic point of view at the local level, due to the generation of jobs, in addition to recovering areas that due to their characteristics are not suitable or capable of implementing other productive activities.

REFERENCES

Documentos de la Carpeta Básica del Ejido Huatziran, Municipio la Huacana, Michoacán.

Esquivel, C. J. *et. al.* 2010. **Programa de Mejores Prácticas de Manejo para la provisión de servicios ambientales, para el ejido Huatzirán y sus Anexos**, municipio de la Huacana, Mich. Proyecto subsidiado con recursos del Programa ProÁrbol: CONAFOR – ISACE. A. C. 25 PP.

Esquivel, C. J., Campoverde, O. J., Pérez, S. R. E., Esquivel, M. J. I. 2014. **Estructura y biodiversidad del ecosistema forestal del trópico seco en la reserva de la biósfera del ejido Huatzirán, Michoacán, México.**

Esquivel, C. J. *et. al.* 2015. **Programa de Mejores Prácticas de Manejo para la provisión de servicios ambientales, para el ejido Huatzirán y sus Anexos**, municipio de la Huacana, Mich. Proyecto subsidiado con recursos del Programa ProÁrbol: CONAFOR – ISACE. A. C. 30 PP.

H. Congreso de la Unión. 1996. **Ley General del Equilibrio Ecológico y Protección al Ambiente.** Diario Oficial de la Federación, 13 de diciembre de 1996, México, D.F.

H. Congreso de la Unión. 2005. Reglamento de Ley General de Desarrollo Forestal Sustentable, Diario Oficial de la Federación el 21 de febrero de 2005, México, D.F.

ISACE, A.C. 2014. **Manifestación de Impacto Ambiental Para Mitigar los Efectos Negativos en el Aprovechamiento de Recursos Forestales no Maderables en el Ejido Huatziran, Municipio de la Huacana, Michoacán.**

ISACE, A.C. 2014. Aviso **Para el Aprovechamiento de Recursos Forestales no Maderables en el Ejido Huatziran, Municipio de la Huacana, Michoacán.**

SEMARNAT. 2018. **DECRETO** por el que se abroga la LGDFS, del 25 de febrero de 2003**, se expide la Ley General de Desarrollo Forestal Sustentable**; y se reforma el primer párrafo al artículo 105 y se adiciona un segundo párrafo al mismo artículo de la Ley General del Equilibrio Ecológico y la Protección al Ambiente.

Rzedowski, J., 1978. **Vegetación de México.** Ed. Limusa. México, D.F. 283-310 pp.

SEMARNAT.2007. **DECRETO con la categoría de reserva de la biosfera, la región conocida como Zicuirán-Infiernillo,** municipios de Arteaga, Churumuco, La Huacana y Tumbiscatío, en el Estado de Michoacán.

http://agrobicentenario.com/guano_de_murcielago.html

http://guanofol.com/index-2.html

http://www.guanoextraplus.infored.mx/807473_Guano-Extra-Plus.html