

### **Project Update: February 2023**

One of the most important crops nationwide is the *Agave tequilana* Webber (blue variety). There are some aspects related to the crop, which have generated concerns in different sectors of the society, such as: 1) the loss of biodiversity in the landscape (considered as a World Heritage Site - UNESCO), mainly due to deforestation and soil and water pollution; 2) suppression of the flowering stage, resulting in asexual reproduction that results in clones; and 3) the proliferation of pests, which leads to the use of large amounts of agrochemicals.



**Figure 1.** Part of the work team is carrying out the installation of the sampling equipment and the registration of birds.

The loss of biodiversity is negative for productive systems, since it provides multiple services and benefits that otherwise must be compensated for with an increase in "artificial" inputs. For this reason, the documentation of biodiversity in the agave landscape will allow us to have baseline information to better understand the services that it can provide to the productive system, the impact of the crop on biodiversity, and develop strategies to reduce it and to move towards its conservation.



**Figure 2.** Current view of the distribution of productive plots in the municipality of El Arenal. Some growers (a few number) maintain live fences.

In this sense, we are developing a project to record the diversity of birds and mammals, both within Agave crops and in the surrounding vegetation in the municipality of El Arenal. For birds, binoculars and field guides are being used, and we are using camera traps to record mammals and other species of fauna.

During 3 months of sampling, we have identified about 38 species of birds within the crops, and about 36 in the surrounding vegetation (Table 1), as well as 10 mammals. The species that have been recorded have important functions and ecosystem services such as pest control, nutrient cycling, seed dispersal, pollination, among others.

Table 1. Bird species with more records in the two conditions evaluated (crops, native vegetation).

Agave crops			Native vegetation		
Scientific name	English name	Number of records	Scientific name	English name	Number of records
<i>Aimophila ruficeps</i>	Rufous-crowned Sparrow	44	<i>Polioptila caerulea</i>	Blue-gray Gnatcatcher	27
<i>Troglodytes aedon</i>	House Wren	33	<i>Passerina amoena</i>	Lazuli Bunting	10

<i>Zenaida asiatica</i>	White-winged Dove	32	<i>Passerina caerulea</i>	Blue Grosbeak	8
<i>Chondestes grammacus</i>	Lark Sparrow	17	<i>Troglodytes aedon</i>	House Wren	8
<i>Polioptila caerulea</i>	Blue-gray Gnatcatcher	17	<i>Icterus pustulatus</i>	Streaked-backed Oriole	7
<i>Toxostoma curvirostre</i>	Curve-billed Trasher	11	<i>Leiothlypis celata</i>	Orange-crowned Warbler	7
<i>Passerina caerulea</i>	Blue Grosbeak	10	<i>Poocetes gramineus</i>	Vesper Sparrow	7
<i>Setophaga coronata</i>	Yellow-rumped Warbler	10	<i>Cyanthus latirostris</i>	Broad-billed hummingbird	6
<i>Spizella passerina</i>	Chipping Sparrow	9	<i>Empidonax sp.</i>	Flycatcher	6
<i>Columbina inca</i>	Inca Dove	7	<i>Melospiza lincolnii</i>	Lincoln's Sparrow	6



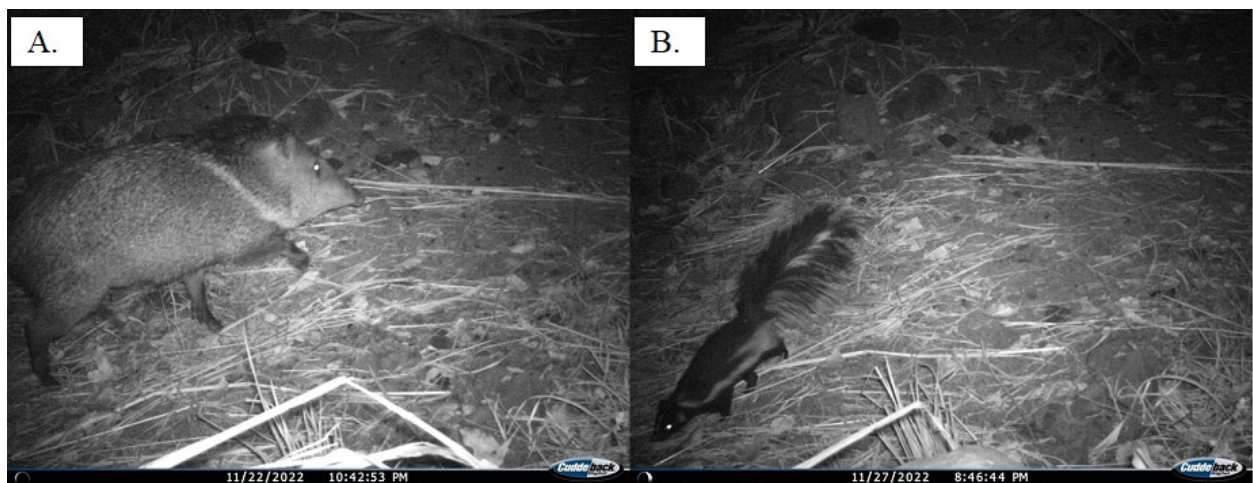
**Figure 3.** Location of two of the three camera traps that are being used in this project. The first was located in an isolated tree within an agave crop (A); the second is located on the edge of the passage of a temporary stream that borders an agave crop (B). A red circle shows the location of the cameras.



**Figure 4.** Bird species recorded in agave crops in the municipality of El Arenal. A) Yellow-rumped Warbler (*Setophaga coronata*, winter migratory; B) Rusty-crowned Ground-Sparrow (*Melospiza kieneri*, endemic to Mexico).

It is important to recognise that some of the problems currently facing the crop can be addressed with medium and long-term plans that include nature-based solutions such as diversity management and the recovery of ecosystem services, which can promote a production chain with less impact.

Finally, work is being done on the socialisation of the project and the results with the community, tequila producers and tourists from the agave landscape. A presentation with producers is being organized by the Tequila Regulatory Council - CRT and the Agency for Health, Safety and Food Quality - ASICA. Likewise, the design of the surveys to evaluate the perception of the different social actors on the cultivation of agave has already been carried out.





**Figure 5.** Photographs of mammals taken by trap cameras, in which species are: A) Collared peccary (*Pecari tejacu*), B) Hooded skunk (*Mephitis macroura*), C) Bobcat (*Lynx rufus*) have been recorded, D) Coyote (*Canis latrans*).



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# Conociendo el cultivo de agave

Municipio: \_\_\_\_\_ Edad: \_\_\_\_\_  
Género: Mujer \_\_\_\_\_ Hombre \_\_\_\_\_ No quiero especificar \_\_\_\_\_

**En la cadena productiva del tequila me identifico como:**

- Propietario cultivo \_\_\_\_\_
- Propietario hacienda \_\_\_\_\_
- Proceso industrial \_\_\_\_\_
- Catador \_\_\_\_\_
- Propietario marca de tequila \_\_\_\_\_

**Sobre el cultivo de agave y la economía pienso:**

**Positivo** \_\_\_\_\_  
\_\_\_\_\_

**Negativo** \_\_\_\_\_  
\_\_\_\_\_

**Sobre el cultivo de agave y el medio ambiente pienso:**

**Positivo** \_\_\_\_\_  
\_\_\_\_\_

**Negativo** \_\_\_\_\_  
\_\_\_\_\_

**Sobre el cultivo de agave y la salud humana pienso:**

**Positivo** \_\_\_\_\_  
\_\_\_\_\_

**Negativo** \_\_\_\_\_  
\_\_\_\_\_





# Conociendo el cultivo de agave

Lugar de procedencia: \_\_\_\_\_ Edad: \_\_\_\_\_  
Género: Mujer \_\_\_\_\_ Hombre \_\_\_\_\_ No quiero especificar \_\_\_\_\_

Antes de la exposición fotográfica, ¿conocía la biodiversidad asociada al cultivo de Agave? Si \_\_\_\_\_ No \_\_\_\_\_

Sobre el cultivo de agave y el medio ambiente pienso:  
Positivo \_\_\_\_\_  
\_\_\_\_\_

Negativo \_\_\_\_\_  
\_\_\_\_\_

La fotografía que más me impactó fue: \_\_\_\_\_  
¿Porqué? \_\_\_\_\_  
\_\_\_\_\_

Considero que la biodiversidad del cultivo de Agave es importante en la producción del Tequila: Si \_\_\_\_\_ No \_\_\_\_\_ Es indiferente \_\_\_\_\_

¿Le gustaría que hubiera recorridos para observar la fauna de la zona? Si \_\_\_\_\_ No \_\_\_\_\_



# Conociendo el cultivo de agave



Municipio: \_\_\_\_\_ Edad: \_\_\_\_\_  
Género: Mujer \_\_\_\_\_ Hombre \_\_\_\_\_ No quiero especificar \_\_\_\_\_

Tengo relación directa con el cultivo de agave: Si \_\_\_\_\_ No \_\_\_\_\_

Si respondió que sí, cómo es la relación:

Siembra \_\_\_\_\_ Mantenimiento \_\_\_\_\_ Jimación \_\_\_\_\_

Propietario terreno \_\_\_\_\_ Rento terreno para sembrar \_\_\_\_\_

El cultivo me genera:

Estabilidad económica: Si \_\_\_\_\_ No \_\_\_\_\_

Riesgos a la salud: Si \_\_\_\_\_ No \_\_\_\_\_

Otro: \_\_\_\_\_

Sobre el cultivo de agave y la economía del municipio pienso:

Positivo \_\_\_\_\_  
\_\_\_\_\_

Negativo \_\_\_\_\_  
\_\_\_\_\_

Sobre el cultivo de agave y el medio ambiente del municipio pienso:

Positivo \_\_\_\_\_  
\_\_\_\_\_

Negativo \_\_\_\_\_  
\_\_\_\_\_

Sobre el cultivo de agave y la salud humana de los pobladores del municipio pienso:

Positivo \_\_\_\_\_  
\_\_\_\_\_

Negativo \_\_\_\_\_  
\_\_\_\_\_

