PROJECT FOR THE STUDY AND CONSERVATION OF BIRDS IN THE PRIVATE PROTECTED AREA KOMCHÉN DE LOS PÁJAROS.

KOMCHÉN DE LOS PÁJAROS. SUMMARY OF ACTIVITIES (2019-2022) AND PROJECTIONS

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1- BIRD DIVERSITY STUDY AND MONITORING SUBPROJECT.

In Mexico, 294 species and 98 subspecies of birds are considered in some category of risk (SEMARNAT 2010) but see Navarro-Sigüenza et. al. 2014), it is estimated that 429 species have populations that have been reduced in recent years (BirdLife International 2015a). Because of the above, it is critical that there are reserves - private and public - that provide habitats of good quality and quantity and sustain the bird populations of the different ecosystems that comprise them. However, reserves are not isolated and changes in the broader landscape - including changes in land use and climate change - can affect their populations. Having a monitoring program could indicate the status of these populations, whether they are in decline, and how the reserve is functioning as a refuge from regional changes.

Natural habitat is the cornerstone of all conservation initiatives to ensure the long-term survival of species -including avifauna-. For this, the first and fundamental task of the administration of the Private Protected Area ''Komchén de Los Pájaros'' (PPA), was find out in a quick way, but with scientific support, the biodiversity present within the properties and to evaluate its real potential as a natural reserve of the low deciduous forest ecosystem. This was the main priority in the first year of work (March 2019-March 2020).

A-Komchén de Los Pájaros: conservation through collaboration and education

To obtain the inventory of the avifauna of the Komchén de Los Pájaros Private Protected Area, we only had a preliminary list carried out by Mrs. Barbara MacKinnon, during visits to these properties before they were made official as Protected Area.

From the first moments that this Private Protect Natural Area, was made official, we have been able to establish inter-institutional management, articulated and sustained in time, which has allowed us to work under the technical assistance and supervision of different peninsular and international research centers during the three years of its existence.

In the first year, two citizen science exercises were carried out - known as Bioblitz - where a group of people from the community, children, young people, students, and specialists photographed everything they observed during two days in each event, information that was uploaded on the spot to the INaturaList pages. The volunteers were divided into groups and their field trips were always accompanied by one or more bird experts for identification and verification of the photos. For the identification of bird species, mist nets were used under the supervision of Dr. Griselda Escalona and her team from the Colegio de la Frontera Sur (ECOSUR) and Dr. Richard Feldman from the Centro de Investigación Científica de Yucatán (CICY), who also provided training for the non-expert participants. Eight transects were implemented within the area, with the support of other specialists from different institutions in addition to those mentioned above, such as the Yucatan Science Park, the Autonomous University of Campeche, the Chiná Technological Institute, and a group from Western Colorado University. Although bird specialist Barbara Mackinnon was unable to join us in the field, she was kind enough to review the first list that emerged from these exercises.

B. The study of bird diversity in the protected natural area.

The updated inventory of the avifauna is available on our Blog, as well as the technical reports of each Bioblitz. The photographs of most of the species sighted in this process of identification through the citizen monitoring exercise, many can be found on the iNaturalist page, in the project called:

"Biodiversity in Komchén de Los Pájaros and its surroundings".

KOMCHÉN
DE LOS PÁJAROS

Biodiversidad en "Komchén de los pájaros" y sus alrededores

Komchén de los Pájaros, un área natural voluntariamente destinada a la conservación es un fragmento de la selva baja caducifolia de la Península de Yucatán, ecosistema considerado amenazado a nivel mundial. El objetivo de este proyecto es explorar, conocer y registrar la riqueza biológica presen…

Link: https://www.inaturalist.org/projects/biodiversidad-en-komchen-de-los-pajaros-y-sus-alrededores.

Drs. G. Escalona and Vargas Contreras J.A. placing mist nets identify birds with students.

Youngsters from Dzemul during the Bioblitz
Looking for species and photographing them with cell phones

Students, scouts, and volunteers learning how to captured by the experts

Professors accompanied by participants

Once the inventories of the main groups (plants, mammals, reptiles, insects, and birds) were completed, monitoring began with camera traps to record birds and mammals and was complemented with the use of fixed transect walks that continue to be carried out two weeks for every month. This has allowed us to incorporate into the list of birds obtained in the Bioblitz, other species that were difficult to observe and photograph, such as the Northern potoo and its chick (Nyctibius jamaicensis) and the Thicket or Rufescent tinamou (Crypturellus cinnamomeus), which we now know reproduce in Komchén de Los Pájaros, the Black-throated Bobwhite (Colinus nigrogularis) among others.

Of the 150 bird species that have been recorded to date within the protected area, 11 of them are endemic to the Yucatan Biotic Province,17 are in a category of risk of extinction according to the Official Mexican Standard (NOM-059-SEMARNAT- 2010), 14 are subject to special protection (Pr) and 3, the Ocellated turkey (Meleagris ocellata) and the Yucatan parrot (Amazona xantholora) are in the threatened species category (A), along with the Common ground dove (Columbina Passerina).

While for the IUCN 4 species are considered as near threatened: the Ocellated turkey (Meleagris ocellata), the Painted bunting (Passerina ciris), the Eastern Meadowlark (Sturnella magna) and the Black Catbird (Melanoptila glabrirostris), which was under special protection and moved along with the previous ones to the near-threatened category (NT). The Yucatecan gnatcatcher (Polioptila albiventris) was considered (DD), with insufficient data to evaluate its conservation status.

Northern Potoo

(Nyctibius jamaicensis)

by: Álvaro Montero

Thicket Tinamou

(Crypturellus cinnamomeus)

Xiomara Gálvez.

Black throated Bobwhite

(Colinus nigrogularis)

Leonardo Guerrero González

Painted Bunting (*Melanerpes pygmaeus*).

By: Claudia Más Fernández

White fronted Parrot *(A. albifrom)*

Rubén de la Cruz

Olive throated Parakeet
(*Eupsittula nana)*
By: Aldo Echeverría

Common ground Dove *(Columbina Passerina*)
by Aldo Echeverría

List of species with some IUCN conservation status, distribution, and seasonality

Endangered (A). Near threatened (NT). Resident species (R)
Subject to special protection (Pr). Least concern (LC). Winsor migrant (M)
Endemic to the Yucatan Peninsula Biotic Province (E). Residents con población migratory (RM)

Scientific name	**English**	**DISTRI-BUTION**	**NOM-59**	**IUCN**	**SEASONALITY**
Amazona xantholora	Yucatan Parrot	E	A	LC	R
Columbina Passerina	Common ground Dove	N	A	LC	R
Meleagris ocellata	Ocellated Turkey	E	A	NT	R
Amazona albifrons	White fronted Parrot	N	Pr	LC	R
Ardea herodias	Great Blue Heron	N	Pr	LC	R/M
Buteo albonotatus	Zone tailed Hawk	N	Pr	LC	M
Butheogallus urubitinga	Great Black Hawk	N	Pr	LC	R
Crypturellus cinnamomeus	Thicket Tinamou	N	Pr	LC	R
Eupsittula nana	Olive throated Parakeet	N	Pr	LC	R
Geranoaetus albicaudatus	White tailed Hawk	N	Pr	LC	R
Leptotila verreauxi	White tipped Dove	N	Pr	LC	R
Melanoptila glabrirostris	Black Catbird	E	Pr	NT	R
Micrastur semitorquatus	Collared Forest falcon	N	Pr	LC	R
Pachyramphus major	Gray collared Becard	N	Pr	LC	R
Passerina ciris	Pinted Bunting	N	Pr	LC	M
Zenaida aurita	Zenaida Dove	N	Pr	LC	R
Vireo pallens	Mangrove Vireo	N	Pr	LC	R

C- Monitoring of avifauna and dissemination of the importance of the Protected Area.

Feeding habits of the Horned Owl (Bubo virginianus) led by Dr. Griselda Escalona of ECOSUR and her team.

Beginning in January 2021 horned owl pellets were searched for under two feeding perch sites to learn about their feeding habits. In May the juveniles began to move a greater distance. According to Komchén's caretaker (David Chí Aké), one died from electrocution days before 27 May 2021. The photo below was taken a day later. After that date, the owls are occasionally at their perching site, but since June we have not found any more pellets.

Great Horned Owl (Bubo virginianus) & chicks courtesy: Sol de Mayo Mejenes

Juvenile Great horned Owl & one of its parents courtesy: Sol de Mayo Mejenes

So far, we have 40 pellets, of which 36 are from horned owl individuals and 4 pellets from another species that were collected near Cenote 2. A camera trap has been placed in 2022 to monitor the nest they have been making in the same tree since 2016, to deepen the study begun the previous year.

Owl pellet bay Griselda Escalona

juvenile great horned owl wings, dead

Monitoring of bird nests. We have conducted an intensive search for nests in the trails of Komchén de Los Pájaros PNA and in the town of Dzemul with the idea of finding out what

materials the birds use to build their nests. We are interested in knowing in the long term what is happening with plastic and other materials of human use. Comparatively, in the nests recorded in Komchén, there are fewer anthropic materials and there are more nests.

Icterus gularis nest with Vegetation and blue-colored with plastic by Griselda Escalona

Icterus nest used by (*Myiozetetes similis)*, two chicks from the species. Griselda Escalona

We continue to work to promote bird conservation inside and outside the reserve. Our goal is to keep the list of resident and migratory species updated, carry out actions to conserve their habitats, and strengthen and expand the existing link with collaborators and supervisors of scientific institutions with which we have collaboration agreements, to continue designing and implementing studies and actions that contribute tools for sustainable management:

- Identify bird species of greatest interest for the development of ornithological tourism and spatially locate the main sighting areas.
- Process and evaluate data to obtain consistent results for management and prepare them for publication, and presentation in forums, conferences, and workshops on biological diversity in the NPA and beyond.
- Elaborate recommendations for its use and promotion of those considered with some degree of threat in the NOM, considering the potential and vulnerabilities of the site.
- Establish an Environmental Education Program for the PA that focuses on species of conservation interest and within it, an important segment will be the section dedicated to birds, using the Yucatan Parrot as a symbol.

D- Migratory birds

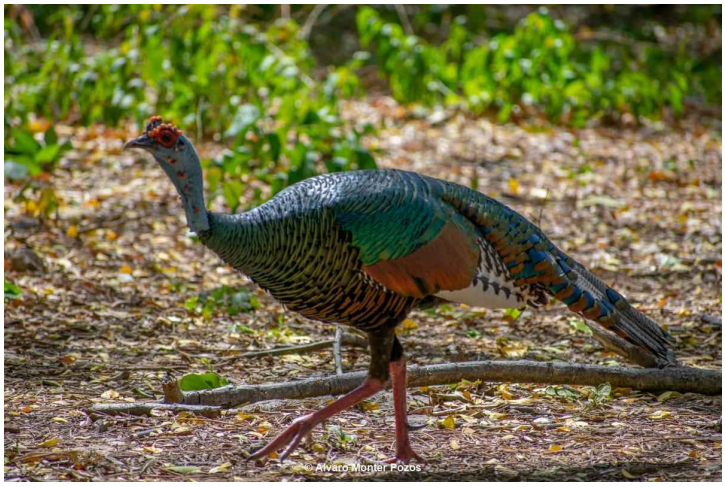
Migratory birds arrive annually to the Yucatan Peninsula and use the habitats found in the area, to rest and accumulate energy during migration periods (one in spring and one in

autumn) and also to spend the entire winter. Because they do not breed in the area, their needs are somewhat different from those of the residents. Specifically, it is extremely important that the species can find enough food to use as fuel for their long flights. However, so far, it is unknown whether the energetic demands of birds vary between seasons and how flexible the diets of migratory birds are to take advantage of the natural seasonal variation that exists in the habitats of the area. In addition, other studies have shown that climate change is affecting when different resources are not present, for example, when certain plant species produce their late fruits, it will require an adjustment by the birds.

As part of the collaboration with the Scientific Center of Yucatan (CICY), Aldo Ivan Echeverria Caro, is a candidate for doing his Ph.D. studies, with a research project, "Resources-Consumer Interaction in Bird Communities", in mangrove ecosystems, low deciduous forests, and low thorny forests, delimiting transects of one hundred meters in each type of habitat. Observations are only made during migration periods, at the end of the rainy season (August-November), in the north (December-February) to model and evaluate which are the species that expand their food plasticity, which have been hypothesized to persist in each habitat during the whole season and which they consume the available resources although these vary in their type (different species of plants and invertebrates) in time, while migratory birds, which show little food plasticity, move between habitats looking for sites with specific resources, so it is expected that they will present interactions according to the availability they find. Therefore, the objective of this study will be to monitor the interactions between birds and their main food resources - fruits and insects - to discover the seasonal variation between the presence and intensity of these interactions. This study expanded the research area to the reserve's zone of influence and thus the bird inventory was increased with 23 new species observed within the boundaries of Komchén de Los Pájaros NPA.

2- SUBPROJECT FOR THE RECOVERY OF THE YUCATAN PARROT AND THE OCELLATED TURKEY

The ocellated turkey (Meleagris ocellata) is an endemic gallinaceous species of the biogeographic region of the Yucatan Peninsula that includes the states of Campeche, Yucatan, Quintana Roo, the border area of the states of Tabasco and Chiapas with Campeche in Mexico, northern Guatemala, and Belize. It is listed in CITES Appendix III (IUCN 2020). Its management has been limited and uncoordinated, although it responds positively to conservation efforts (Calmé et. al. 2010).



Turkey (Meleagris ocellata) by Sol de Mayo Mejenes

It has the following objectives:

- To determine the population size of ocellated turkeys within the Komchén de Los Pájaros PA and its zone of influence.
- Evaluate the degree of habitat disturbance inside and outside the PA and relate it to population size.
- Propose strategies for the care and management of the ocellated turkey and its habitats in the PA.
- Evaluate and improve the environmental education program in the surrounding communities working with three target groups.

To estimate the population, sampling will be done inside and outside of the protected area, every two weeks and divided into two groups of three people each. They will walk the eight trails inside the reserve beginning at dawn, around 6:00 a.m., until 11:00 a.m. and from 3:00 p.m. to 7:00 p.m., while the other group will walk the trails and paths marked in the common land, surrounding the reserve, at the same times until they observe a turkey. On the second day, they will change their work zone with that of the previous team. In each case, one member of the team will get a quick evaluation of the environment (if it is disturbed, type of vegetation, if there are freshwater bodies, if there is frequent traffic on the trails) etc. Another person will take photos of the site, while the third collects sample and records the associated bird species.

When observing one or several turkeys, the note will be taken of the total number, number of females, number of males, age structure (chicks, young and adults), geographic coordinates, activity they were doing (feeding, courting, fighting, lying in the wallow), if feeding, what they were feeding on (fruits, green leaves, flowers, insects, invertebrates), etc., should be noted on the field form. Traces of hunting will also be noted and, if possible, photos will be taken. The surroundings of the sighting will be searched for

feathers or droppings. Turkey droppings will be placed in amber glass jars. Feathers will be collected and stored in aluminum foil, all samples will be labeled with the coordinates and date. Once labeled, they will be frozen at (-20ºC) to prevent the organic matter from degrading. The samples will be taken to the Epomex Institute, by ECOSUR specialists (who are conducting a similar study in the state of Campeche), to detect the presence of contaminants: microplastics, organochlorine pesticides (POCs), and polycyclic aromatic hydrocarbons (PAHs).

The camera traps inside, have allowed us to corroborate the existence of a population that remains and reproduces within the area, an idea of the size of the groups, and the most frequented areas. This information will help us to organize the monitoring work according to the season of the year (rainy, dry, and winter, reproductive, and non-reproductive seasons).

We are trying to acquire new cameras to place some on common shareholder lands, and document, as much as possible, the predation pressures of recent coyote colonizers inside and outside the NPA and hunting outside the NPA.
Interviews will be conducted in the communities of Dzemul, Telchac Pueblo, San Eduardo, and Sacapuc, to obtain information on the perception of local personnel, on hunting, use, and management of turkeys and other species for local consumption and for sale. The results will be used as a basis for environmental education workshops, which will focus on exemplifying the importance of training local guides, on the possibility of using the ocellated turkey along with other threatened species, as more profitable financial capital, by attracting groups of ecotourism to the community as well as making them participate in the actions to be undertaken to minimize the pressures that exist on the threatened species that make up their natural heritage, among others, the need to eradicate the bad practice of depositing solid waste, in the environment that surrounds them, particularly the plastics.

Pair of Yucatec parrots in the breeding season. The male is above the female and is characterized by more vivid colors around the eye and yellow Ceres. The dark cheek is

2.2 Conservation of the Yucatecan Parrot

There are 22 species of parrots in Mexico and four are found in Yucatan. All are in some threatened category of the Mexican Official Standard, due to the pressures that their populations have suffered from the destruction and fragmentation of their habitat and the lacerating bird trade, which, in the case of parrots, not only depletes their populations by the removal of newborn chicks but in the process, many of their nests are destroyed to obtain them.

The Yucatan Parrot was subject to special protection (Pr) under NOM-059-SEMARNAT-2001 and considered a threatened species (A) under NOM-059-SEMARNAT-2010 and is listed in CITES Appendix II and currently as Near Threatened NT by the IUCN.

It inhabits the jungles of a good part of Yucatan, (Mexico), Guatemala, Belize, and Honduras. It is very similar to the white-fronted parrot (Collar 1994) with which it shares a habitat in the wild. Three parrots have been recorded in the ANP: the Yucatan parrot (Amazona xantholora), the White-fronted parrot (Amazona albifrons), and the Olive-throated parakeet (Eupsittula nana), the latter considered under special protection in NOM-059-SEMARNAT-2010.

Yucatan Parrot (*Amazona xantholora*) male

Yucatan Parrot (*Amazona xantholora*) female

White fronted Parrot *(Amazona albifrons) male*

White fronted Parrot (Amazona albifrons) female

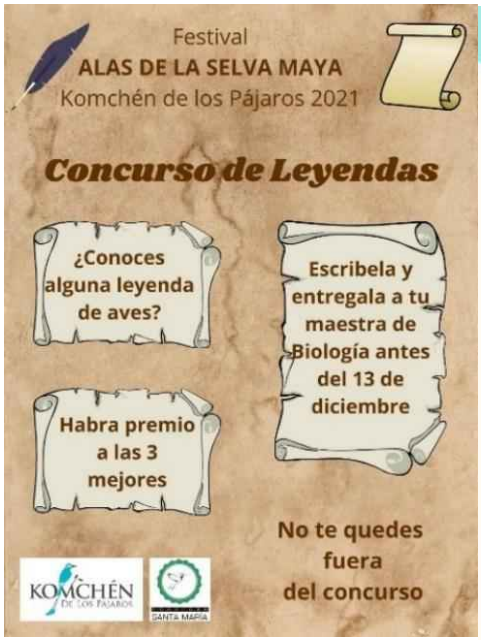
This project is still in the initial research phase, but it is based on some fundamental pillars:

• Research: on ecology, habitat use, and food availability in dry and rainy seasons for these psittacines, within and in the PA's area of influence.

• Management: studies of the availability of nesting substrate for the parrot and its competitors for the use of cavities within the reserve and in its zone of influence, to establish surveillance, protection, and conservation of the nests located, involving community members in the process.

• Creating Awareness: work with focus groups within the local population (children, hunters, and grass cutters, in the first instance) to convince them of the importance of this bird for Yucatan and the advantages of caring for it as an economic resource, as it has great potential as a product for ecotourism, in its modalities of avitourism and scientific tourism.

In collaboration with CCC, "Santa Maria Group" is working to join efforts in the Environmental Education program, using the Parrot as a flagship species. It was planned to celebrate the ''Wings of the Maya Forest'' festival with a week of varied activities for children and adults and, as part of this, to carry out a campaign to clean up solid waste dumps around the influence of the ANP. Due to the arrival of the omicron virus, this was postponed for the current year.



As part of the observations of the researcher Aldo Iván Echeverría, there is a list of the three species of parrots observed by him in 2021. The most abundant species is the Olive-throated parakeet with 100 individuals in flocks of between 2 and 14 birds, the Yucatecan Parrot has 5 individuals (a pair and a trio), and the White-fronted Parrot, has 2 individuals.

Common name	Scientific name	Abundance	Site	Latitud	Longitud	Date
White fronted Parrot	*Amazona albifrons*	2	Santa Gertrudis ponds	21.0480122	-89.5816666	18/09/2021
Yucatan Parrot	*Amazona xantholora*	2	Santa Gertrudis ponds	21.0480122	-89.5816666	19/09/2021
Yucatan Parrot	*Amazona xantholora*	3	Komchén de Los Pájaros	21.2149802	-89.3362713	10/05/2021
Olive throrated Parakeet	*Eupsittula nana*	5	Komchén de Los Pájaros	21.2149802	-89.3362713	03/11/2020
Olive throrated Parakeet	*Eupsittula nana*	13	Komchén de Los Pájaros	21.2149802	-89.3362713	09/11/2020
Olive throrated Parakeet	*Eupsittula nana*	2	Komchén de Los Pájaros	21.2149802	-89.3362713	08/12/2020
Olive throrated Parakeet	*Eupsittula nana*	2	Komchén de Los Pájaros	21.2149802	-89.3362713	05/01/2021
Olive throrated Parakeet	*Eupsittula nana*	4	Komchén de Los Pájaros	21.2149802	-89.3362713	11/01/2021
Olive throrated Parakeet	*Eupsittula nana*	2	Komchén de Los Pájaros	21.2149802	-89.3362713	18/01/2021
Olive throrated Parakeet	*Eupsittula nana*	4	Komchén de Los Pájaros	21.2149802	-89.3362713	01/03/2021
Olive throrated Parakeet	*Eupsittula nana*	4	Komchén de Los Pájaros	21.2149802	-89.3362713	08/03/2021
Olive throrated Parakeet	*Eupsittula nana*	2	Komchén de Los Pájaros	21.2149802	-89.3362713	03/05/2021
Olive throrated Parakeet	*Eupsittula nana*	6	Komchén de Los Pájaros	21.2149802	-89.3362713	10/05/2021
Olive throrated Parakeet	*Eupsittula nana*	14	Komchén de Los Pájaros	21.2149802	-89.3362713	17/05/2021
Olive throrated Parakeet	*Eupsittula nana*	3	Komchén de Los Pájaros	21.2149802	-89.3362713	23/05/2021
Olive throrated Parakeet	*Eupsittula nana*	2	Komchén de Los Pájaros	21.2149802	-89.3362713	28/06/2021
Olive throrated Parakeet	*Eupsittula nana*	7	Komchén de Los Pájaros	21.2149802	-89.3362713	13/07/2021
Olive throrated Parakeet	*Eupsittula nana*	2	Komchén de Los Pájaros	21.2149802	-89.3362713	19/07/2021
Olive throrated Parakeet	*Eupsittula nana*	2	Komchén de Los Pájaros	21.2149802	-89.3362713	26/07/2021
Olive throrated Parakeet	*Eupsittula nana*	3	Komchén de Los Pájaros	21.2149802	-89.3362713	23/08/2021
Olive throrated Parakeet	*Eupsittula nana*	1	Komchén de Los Pájaros	21.2149802	-89.3362713	30/08/2021
Olive throrated Parakeet	*Eupsittula nana*	6	Komchén de Los Pájaros	21.2149802	-89.3362713	19/10/2021
Olive throrated Parakeet	*Eupsittula nana*	3	Komchén de Los Pájaros	21.2149802	-89.3362713	30/10/2021
Olive throrated Parakeet	*Eupsittula nana*	13	Komchén de Los Pájaros	21.2149802	-89.3362713	23/11/2021
		100				

On January 27th a flock of three individuals of the Yucatecan Parrot was recorded at 5:15 pm near the old machinery room eating cedar fruits, at 5:40 pm they move to the Guanacaste (Enterolobium cyclocarpum) near the library of the A.P., before the arrival of 18 individuals of Olive-throated parakeet, which is the most abundant

species of the three Psittacidae in Komchén and can be observed all year round. Since that date during the month of February and March 2022, a total of 23 individuals of white-fronted parrots (flocks of 4 - 12 individuals), a trio and two pairs of Yucatec Parrot, and a flock of 28 individuals of Olive-throated parakeets that come to feed between five and six in the afternoon very close to the area of visitation have been recorded with an almost daily frequency.

In the case of the Yucatan parrot, observations have occurred only three times (once in January and twice in February). They have been seen consuming Naseberry (Manilkara zapota), Tamarind (Tamarindus indica) Guanacaste (Enterolobium cyclocarpum) and resting in a small citrus plantation (orange and tangerine) that exists. Two observations have been in the afternoon hours coinciding with the white-fronted parrots and one in January, around seven o'clock in the morning. Gálvez X. (unpublished data).

Part of the management that we will establish is, that one area that has been cleared and consequently opened up and which surrounds this space, will be used as a nursery for medicinal plants. We will start planting attractive crops such as a fence of guava and corn plants, the latter between the months of September and December, which corresponds to the fruit production season, as psittacines are usually seen flying and perching around these crops (Whitney 1996).

Although not a lot of cavities have been observed in the most frequented areas of the ANP. The task of walking through the forest to georeferenced possible ones in trunks and/or termite mounds, which could be potential nests for the species, will be initiated.

The breeding season occurs from late February to April, although there are records of nestlings in May in Belize (Russell 1964). The species nests in hollows of "dead" trees, but may also nest in tree crevices, rock walls or termite mounds. Incubation should be similar in duration to that of the White-fronted parrot, i.e., 25 to 28 days (Clinton-Eitniear 1982, Pfeffer and Clayton 1996). Collar (1994) reports that the incubation period for the Yucatan parrot lasts between 22-23 days and the number of eggs varies from 1 to 4. Chicks should leave the nest 7 to 8 weeks after hatching. (San Vicente-López al., 2009).

In the month of April, a probable nesting area will be checked (according to surveys of local farmers) near the coast, about (18 kilometers) from the PA, to try to locate some of the nests of the three species and initiate their study, with a view to facilitating appropriate cavities placed at a convenient distance in Komchén in the future, taking into account that, although the home range of the Yucatan parrot is unknown, (Howell and Web 1995) suggests that its range is at least tens of kilometers, which allows us to hypothesize that increasing the number of cavities (under studied parameters) can be a stimulus to attract them to a protected place and help increase their populations. This practice has been successful in countries

of the region for other Psittacidae species, case study for Cuba in (Galvez, X et. al. (1993), (1995). (1996b) (1999a) (1999b) (1999b)

Additionally, we are working on the planning process to evaluate the hierarchy of the avian resource with respect to the potential for developing ornithological tourism in the protected natural area and its zone of influence. However, we are already open to this type of tourism.

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