

Location of potential birdwatching areas in CIVS San Cayetano, State of Mexico.

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ABSTRACT

Currently bird watching is an activity with future environmental potential for conservation and profitable for human populations, as well for areas that have among their objectives wildlife management and extension of forms of land use, as the center for Wildlife Conservation and Research (CIVS, for its acronym in Spanish). This research was focused on calculating wealth and distribution of birds, with the purpose of establishing qualities that could be attractive and profitable for birding in CIVS San Cayetano. This objective was carried out based on fieldwork between 2013 and 2014, and more information previously collected in the work site, from which 88 species of birds were recorded; among these, eight categorized as ornamental and songbirds, five registered in NOM-059-SEMARNAT-2010 and 14 endemic species to Mexico. The highest species richness with ease and difficulty to be observed were recorded in the pine-oak forest. This range of species is found in a relatively small site (<400 ha), which could well be used as a model to extended to other areas, under agreements with the communities of Villa Allende and the authorities of CIVS, and capture the public interest in watching wild birds, while conserving natural resources.

Keywords: Ecotourism, birdwatching, conservation, development, road density.

RESUMEN

En la actualidad la observación de aves es una actividad con futuro para la conservación del ambiente y redituable para las poblaciones humanas, así como para áreas que tengan entre sus objetivos el manejo de especies silvestres y la extensión de formas de uso del territorio, aspecto que

se lleva a cabo en los centros para la Conservación e Investigación de Vida Silvestre (CIVS). La presente investigación se enfocó a calcular la riqueza y distribución de las aves, con el propósito de establecer cualidades que pudiesen ser un producto atractivo y aprovechable para la observación de aves en el CIVS San Cayetano. Se realizó trabajo de campo de entre los años 2013 y 2014, más la recopilación de información de trabajos anteriores del sitio. Se registraron 88 especies de aves; entre estas ocho catalogadas como especies canoras y de ornato, cinco registradas en la NOM-059-SEMARNAT-2010 y 14 como especies endémicas para México. La mayor riqueza de especies con dificultad y facilidad para ser observadas se registraron en el bosque de pino- encino. Esta gama de especies se encuentra en un sitio relativamente pequeño (< 400 has), que bien podría ser utilizado como modelo para extenderse a otras zonas, bajo acuerdos con las comunidades de Villa Allende y las autoridades del CIVS, y captar al público interesado en la observación de aves silvestres, mientras se conservan los recursos naturales.

Palabras clave: ecoturismo, observación de aves, conservación, aprovechamiento, densidad de caminos.

INTRODUCTION

In Mexico, tourism is the third largest source of foreign income from generating jobs, integrating cultures, promoting local development, and is considered as an activity with future potential (SEMARNAT 2006). Statistics from the World Tourism Organization (UNWTO), point out that in 2012 more than one-seventh of the world's population traveled abroad, which provides an

income for receptive countries (UNWTO 2013). Authors and organizations dedicated to environmental preservation have seen ecotourism as a sustainable option to protect the global natural capital (UNWTO 2013).

The Mexican Ministry of Tourism (SECTUR, for its acronym in Spanish) in 2006 reported that in 2005 Mexico received 12.5 million international tourists, of which the majority (68%) were Americans; also, studies by the UNWTO in 2002 (Cited by Cantú et al. 2011) show that American ecotourists have as a priority see wildlife, of which about 87% are bird watchers. It is estimated that bird watching is performed by about 82 million Americans which brought in 2006 an economic benefit of \$ 35.700 million (USFWS, 2009). Mexico has the potential to capture much of this economic benefit, because according to Navarro and Gordillo (2006) 1,096 bird species have been reported, of which 103 are endemic species, as reported by Living National Treasure (2013).

Based on the above, it is necessary to do research beyond an ornithological inventory, and create knowledge to propose solutions for biological conservation and social welfare. A place for this kind of research is the State of Mexico, ranked among the 10 with most diversity of birds in Mexico, whilst owning 45.7% of the country's species (De Sucre et al. 2009); however at nationwide it is the state that experiences the highest urbanization rate, growth of deforestation areas, of agricultural and livestock areas and open pit mining, among others (De Sucre et al. 2009). These are examples of changes to the environment that directly impact the birds, reducing habitat for resident species and the survival chances for the winter migratory ones (De Sucre et al. 2009).

So this paper proposes to assess the bird watching potential in the CIVS San Cayetano, State of Mexico, based on: a) Mapping the roads, b) Estimating the richness and abundance of birds, c) Generating distribution maps of bird species, and d) Know the tourist importance of birds.

MATERIALS AND METHODS

CIVS San Cayetano is located in the town of Villa Allende in the State of Mexico (Fig. 1),

between the geographic coordinates 19° 20 '52" and 19° 22' 42 " N and 100° 04 '34" and 100 ° 05' 22" W, with an area of 536 hectares (Melo and Contreras, 1974), however, recent studies mention an area of 388.5 ha (Reyes 2013). The main entrance is located on Zitácuaro-Valle de Bravo road, about 8 kilometers from the junction with Independence Highway or pass route that goes from Lerma to Morelia-Guadalajara (Oñate-Ocaña and Herróz-Zamorano 2009). The topography in south area is irregular, with the presence of some ravines and the highest hill (Molcajete at 2785 masl), unlike the north and east areas that has small hills and flat terrain, with lowest altitude (2460 masl) in the offices area.

The prevailing climate is temperate subhumid (Garcia and CONABIO 1998), the rain season is from august to september with annual average of 1000 mm, while the average annual temperature is between 16°C and 18° C (HAGUE 2015).

To fulfill the objectives, the roadmap was developed first, considering those roads with a minimum width of 1.5 m. To georeference a tablet Xperia S (Sony) was used with an integrated GPS and ViewRanger software (Augmentra 2014); the registered segments were converted to .shp format with OKmap software (Paolo 2014) and edited and corrected (overlap, dead ends, intersections and tunnelling segment) in Open Ilwis program v.3.4 (Koolhoven et al. 2007).

With the vegetation map elaborated by Reyes (2013) and the aforementioned map of roads, 28 catching points (CP) and three transects were defined, setting a directed sampling that started in the north of the CIVS. The CP were placed as follows: 15 in *Pinus-Quercus* forest, 5 in *Pinus patula* forest (Schlidl and Cham 1831), 4 in *Quercus-Pinus* forest, 2 in *Quercus* forest and one in *Cupressus lindleyi* forest (Mill. 1768) and *Pinus* forest, respectively (Fig.1). In each CP a mist net was opened from 07:00 to 14:00 hrs (Ralph et al. 1996) for two days straight, covering a period of 14 hours red-1 per point, which totaled 392 hrs for the 28 CP. Captured birds were tagged in the rectrices (to recognize recaptured individuals) identified, took pictures as a record and released.

The three transects were placed considering the different vegetation coverages, located in the

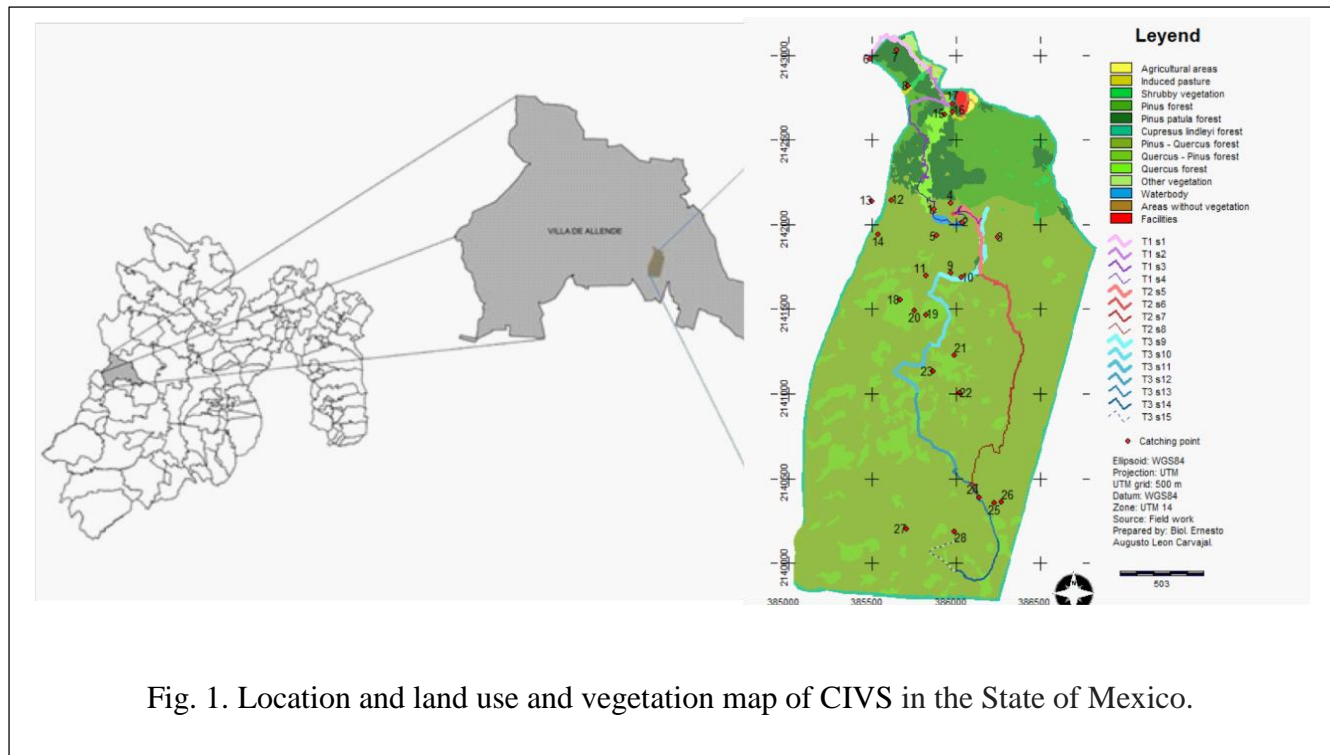


Fig. 1. Location and land use and vegetation map of CIVS in the State of Mexico.

surroundings of the main roads of the CIVS (Fig. 1). The method of counting by bands suggested by Bibby et al. (1998), Bub (1991) and Ralph et al. (1996) was followed, tours that started 15 minutes after sunrise (Bibby et al. 1993). Each transect was divided into segments of 500 m, in order to ease comparison between them due to the heterogeneity of the environment, resulting in 15 segments, four segments for each of the first and second transect and seven for the third, given its length. Along the transect only visual and auditory birds records were taken within a distance not exceeding 30 m (Ralph et al. 1995).

The CP were performed in November (2013), and February and June-July (2014) while transects only in June (2014). The use of both sampling methods was intended to have the record of cryptic species (timid) and those that are not hidden to the human presence, it also has been reported that the mixture of both methods perform better for estimating the birds richness (Bojorges 2006).

The birds observed outside CP and transects were recorded for inclusion in the general CIVS

inventory but were not included in the analysis. The recorded field information was linked to CP and transects maps in Idrisi Selva program (Eastman 2012), that allowed the representation of richness and abundance of birds.

In determining the tourism potential of sites for bird watching, all species recorded in this study and those reported by Second and García (2001) and Oñate-Ocaña and Herróz-Zamorano (2009) were considered, which were classified according to six of the ten criteria of ornithological importance proposed by Haene (2004), modifying one of them, notable species to songbirds and ornamental species based on Rocha et al. (2009). Finally, the following classes were used:

Abundant.- Birds that showed greater proportional abundance ($\pi > 0.025$). For this class only data obtained during transects were taken into account.

$\pi = n_i / N$.
 n_i = number of individuals of the specie i ,
 N = total number of individuals
 (Moreno 2001).

Rare.- Species with pi less than 0.001, plus cryptic species that were captured in CP.

Size.- were classified into three groups 1) Birds with a length less than 20 cm; 2) Birds between 20 and 50 cm and 3) Birds greater than 50 cm.

Songbirds or ornamental.- were documented according to the two types of uses (songbirds or ornamental), based on the list for Mexico developed by Rocha et al. (2009).

Cataloged in risk.- CIVS species registered in NOM-059-SEMARNAT-2010.

Endemic: classified as endemic in NOM-059 species, and in the list of State of Mexico by De Sucre et al. (2009).

In addition to the criteria of ornithological importance, species were classified according to their ease of observation according SEO / BirdLife (2011): 1. Species easy to observe, the larger ones (size group 3) and abundant and; 2. Species difficult to observe, the smallest (size group 1) and rare.

Finally, richness species areas were obtained by summing species records by vegetation type or land use, using the map of vegetation and land use elaborated by Reyes (2013).

RESULTS AND DISCUSSION

For bird watching is necessary to have an adequate road network that allows access to places of interest. In CIVS San Cayetano a length of 35,125 km of unpaved trails and paths were registered, resulting in an overall density of roads of 9.03 km/km². In a study by Ramirez et al. (2005) in the Biosphere Reserve Monarch Butterfly (near the work zone area) a total road density of 4.7 km/km²⁻¹ was registered, high length for a Biosphere Reserve according to the authors, likewise Tchikoug (2002, cited by Ramirez et al. 2005), it mentions that a suitable value for an area under logging in mountainous regions must not exceed 4 km/km², due to the negative ecological consequences produced, as direct loss of habitat, soil compaction, changes in

microclimatic conditions (edge effects) and destructive geomorphological processes, among others.

Considering the path type, CIVS has a density of unpaved trails of 0.629 km/km² and footpath of 8,054 km/km², also higher values compared than those reported by Ramirez et al. (2005), who obtained an average of 0.3 km/km² (min. = 0.2, max. = 3.5) and 4.4 km/km² (min = 0.3, max. = 11.1), respectively. Road density of greater magnitude by vegetation type was obtained in the area of *Quercus* spp. forest (14.4 km/km²) and in the area of *Pinus patula* (10.6 km/km²), followed by the areas with the community of *Pinus* spp. (8.26 km/km²) and those of *Pinus-Quercus* with 6.8 km/km² and *Quercus-Pinus* 6.1 km/km², the last communities are located in areas with more pronounced relief and far from areas of cabana, offices and fauna enclosures.

The richness of bird species obtained in the present study considering the different sampling units (catching points = 31 spp.; transects = 22 spp.) and incidental observations, ascended to 66. However, taking into account research by Segundo and García (2001), where the presence of 44 species of birds were reported, and studies of Oñate-Ocaña and Herróiz-Zamorano (2009) who recorded 23 species, among which 13 were new records from the first publication, so that wealth in all these early publications at the time amounted to 57 species, however, considering the 31 new records of this investigation the total richness for CIVS San Cayetano reaches 88 species (Appendix 1). It is remarkable that from these 88 species, 37 (42%) were reported since 2001 and have remained as residents in CIVS.

According data from Sucre et al. (2009) San Cayetano CIVS contains about 18% (88 of 490 species) of birds registered in the Mexico State, however it must be considered that other lists report fewer species, as Berlanga et al. (2008) who report 407 or the compiled by Llorente-Bousquets and Ocegueda (2008) with only 263 species, what would amount to 21% and 33% of State species, respectively.

If CIVS is compared with surrounding areas such as AICA Sierra Chincua, a site identified by the Government of State Mexico as an area with high

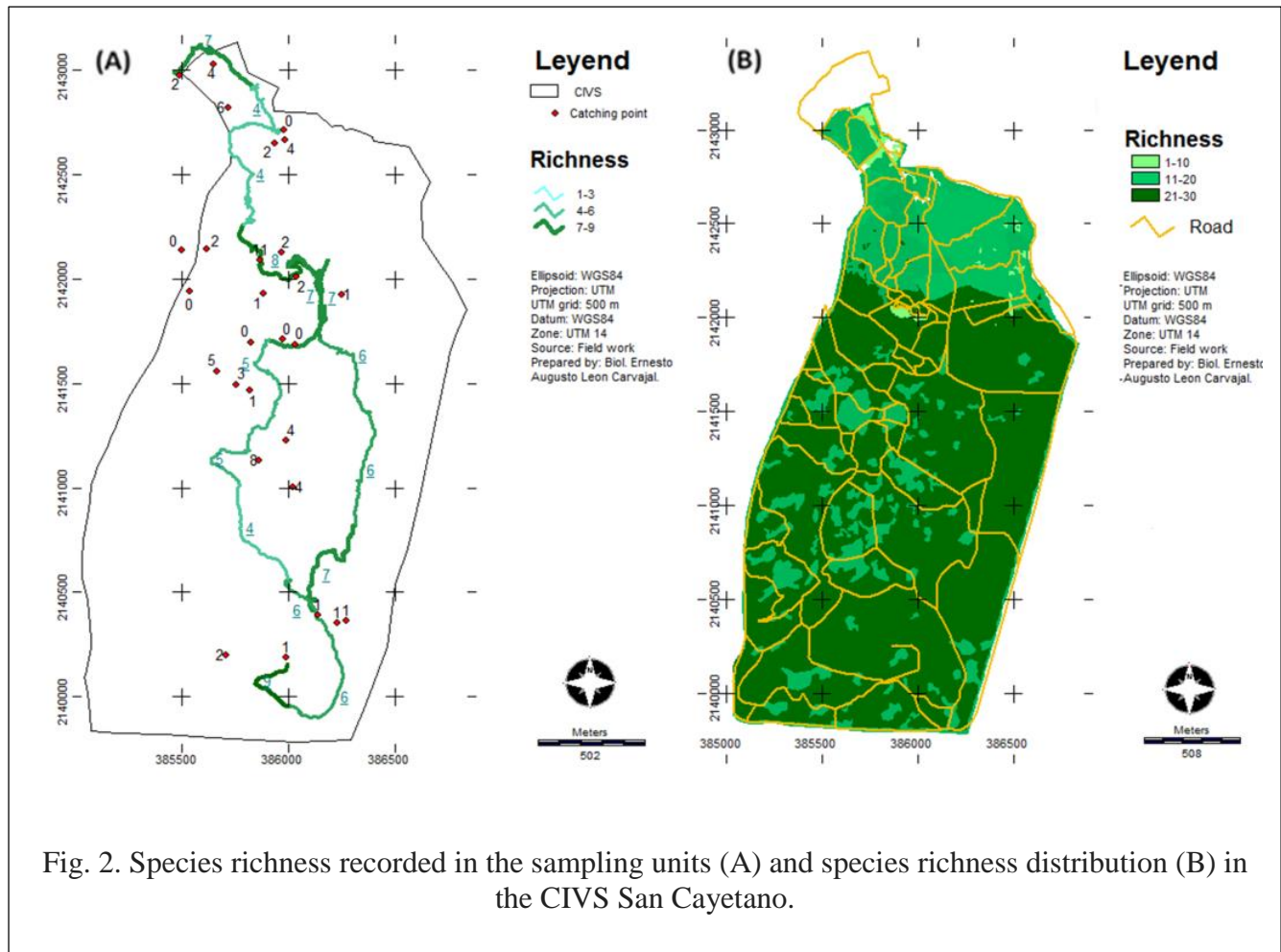


Fig. 2. Species richness recorded in the sampling units (A) and species richness distribution (B) in the CIVS San Cayetano.

diversity of birds that keeps a record of 179 species (Berlanga et al. 2008) San Cayetano CIVS would be considered as an area with low species richness, however, it must be considered that this AICA has an area of 256,204 hectares, more than 500 times the CIVS (388 ha). Also, when comparing the number of birds with similar vegetation sites as the Sierra Nevada (104 spp) and Atlautla de Victoria (87 spp.) in the Mexico State and Nanacamilpa in Tlaxcala (129 spp.) it is shown that the richness of CIVS is located at the lower range end, however, this variation of richness in the State and sites located between the same mountain range are justified by De Sucre et al. (2009). The sites that maintain continuous sampling usually report between 50 and 193 species of birds, so it could be suggested that the

CIVS certainly has a place with significant richness, since except for the inventory of Segundo and García (2001) annual records have not been conducted, which could possibly attach more species to the list so far reported. Examples of these are nocturnal species, which were not considered because samplings were not designed beyond 17:00 hrs, however in various occasions during the month of december it was possible to hear birds belonging to the order of Caprimulgiformes and Strigiformes.

Eight species were identified as abundant; these birds are recommended for casual or inexperienced bird watchers because they tend to be easily observed or heard and also they are distributed in most of the area, especially in the *Pinus-Quercus* forest. The most important species in this group were the Brown-backed Solitaire (*Myadestes occidentalis*, Stejneger,

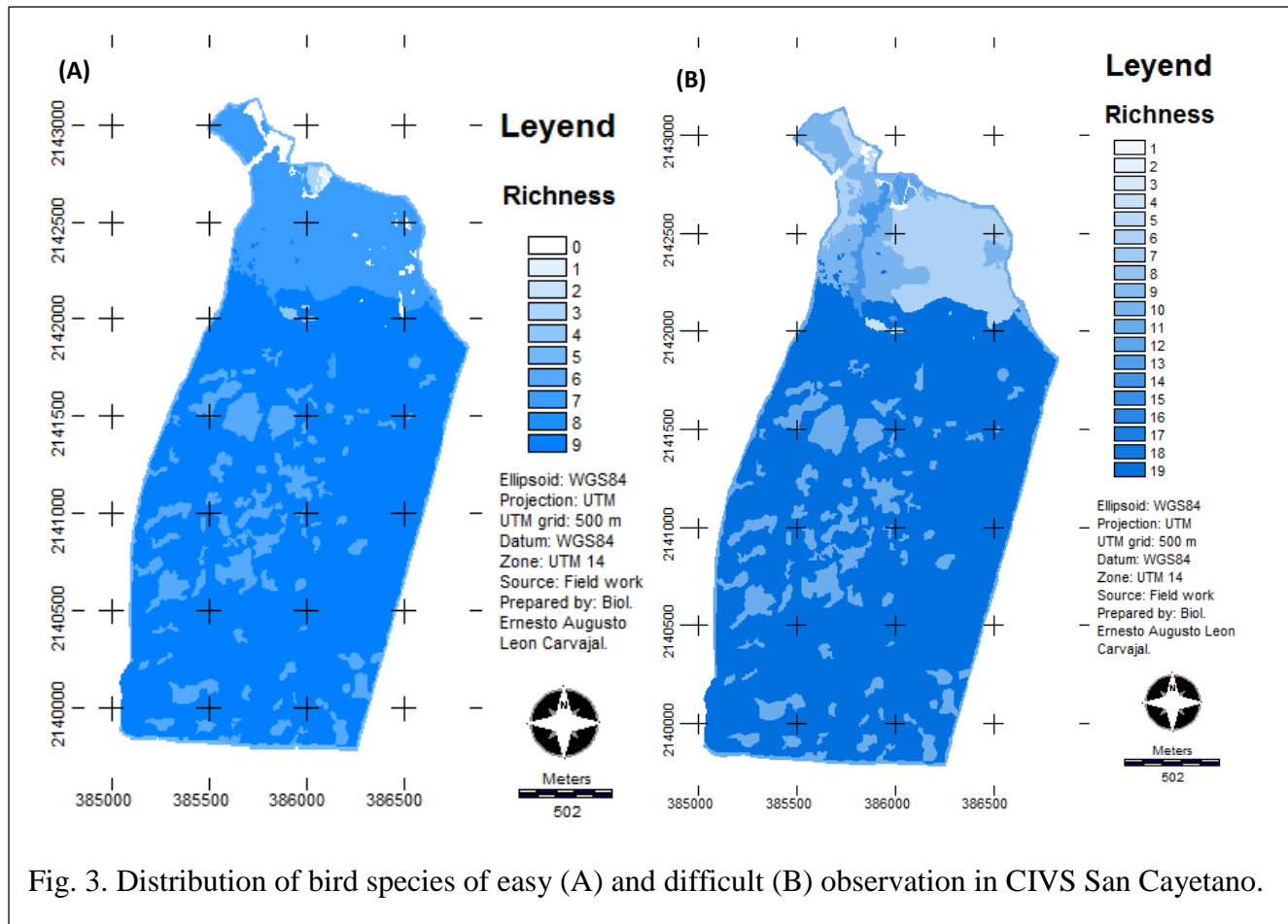


Fig. 3. Distribution of bird species of easy (A) and difficult (B) observation in CIVS San Cayetano.

1882) since had the largest number of records with a $\pi = 0.24\%$, and the Mexican Trogon, also known as Bird Flag (*Trogon mexicanus*, Swainson, 1827) with $\pi = 0.07\%$, which, despite being a difficult species to observe it is possible to hear it, unlike others that are less shy and can be directly observed, such as Yellow-eyed Junco (*Junco phaeonotus*, Wagler 1831).

Rare species, characterized by a low abundance, were represented by 16 species, twice the number of abundant species. However, their distribution is restricted, since they are located in remote areas from human populations, mainly in *Quercus* forest.

As for size classification, for Group 1 (less than 20 cm) were registered 48 species (equivalent to 55% of total species), for group 2 (20 to 50 cm) 33 records were taken (37%) and finally in group 3 (> 50 cm)

seven species (8%) were registered.

While for songbirds and ornamental birds listed by Rocha et al. (2009), the CIVS has eight species (9%). Sites with greater richness of birds with these qualities were agricultural areas and bush vegetation. According to NOM-059-SEMARNAT-2010 in Mexico State five birds are under the category of threatened, of which CIVS has one that is the Prairie Falcon (*Falco mexicanus*, Schlegel 1851), while from the 31 birds subject to special protection four are in the area (5% of the species of CIVS), which are the Least Grebe (*Tachybaptus dominicus*, Linnaeus 1758), Common Black-Hawk (*Buteogallus anthracinus*, Deppe, 1830), the Brown-backed Solitaire (*Myadestes occidentalis*) and Zone-tailed Hawk (*Buteo albonotatus*, Kaup, 1847).

14 endemic species were recorded nationwide in the CIVS: four species listed as quasiendemics

Table 1. Species richness of birds recorded by vegetation and land use in the CIVS San Cayetano.

Using vegetation or soil	(S)	Vegetation and Land Use	(S)
Other vegetation	7	Agricultural areas and facilities (cabins and offices)	16
Shrubbery	8	Forest shrubs <i>Pinus patula</i> , <i>Cupressus lindleyi</i> and <i>Quercus - Pinus</i>	17
Body of water	10	Forest of <i>Quercus</i>	19
Forest of <i>Pinus</i>	14	Forest of <i>Pinus - Quercus</i>	27

distributed almost through the entire CIVS, four semiendemics that have been observed in the agricultural area and *Pinus-Quercus* forest and six endemic distributed mostly in the *Pinus-Quercus* and *Quercus-Pinus* forests. According data from De Sucre et al. (2009) and Berlanga et al. (2008) for Estado de Mexico, is important the presence of quasiendemic species in CIVS, as it has almost 30% of these, while for semiendemics, endemic and threatened species only have values close to 10%.

Based on statistics and compiled data by Cupiche (2007), rare birds with some degree of endemism or under some category of risk are most attractive for committed birdwatchers. UNWTO statistics (2002) also notes that American ecotourists consider the activity of seeing wildlife in their travels as the most important, followed by a visit to wild areas, seeing rare species (unique or endemic) and birdwatching in general.

Fig. 2a shows richness of birds observed at different sampling units (transects). Prominent among these, the transects located in the proximity to the cabins in boundary areas between different plant communities and others located northwest and southeast in proximity to El Molcajete hill. A similar pattern was observed in catching points, recording the highest number of catches to the north of the cabins and at the northwest of the CIVS.

Regarding the distribution of richness according to the type of vegetation, it was noted that within the *Pinus-Quercus* forest 27 species of birds were registered, followed by the rest of tree communities and the agricultural area and facilities with values

between 19 and 14 recorded species, the Almolyita dam recorded 10 species, while bush vegetation 8 and other type of vegetation 7 species (Table 1). These data constitute a pattern of species richness with an increase from northern to south of the CIVS (Fig. 2b).

Considering the records of bird species and their qualities with respect to ease or difficulty of observation, the highest concentration of species of both types was found in the *Pinus - Quercus* forest, while in the case of birds of easy observation (Fig. 3a) sites with fewer species were recorded north of CIVS. The map in Fig. 3b shows suitable sites to watch cryptic species, involving a greater challenge for those who enjoy watching these type of birds.

So the CIVS is not only a site with 88 birds, it also represents a place that can generate jobs and promote the development of sustainable activities for CIVS and surrounding communities, as it hosts two of the three types of the most requested bird by bird watchers, raptors and songbirds or ornamental (USFWS 2007. Cited by Cantu et al. 2011), birds that might come to have the potential to attract a large number of bird watchers from the country and the United States. Specific examples include raptor species, most of which have been observed in the most quiet and comfortable place to observe, located next to the cabins, aside of dam called "Almolyita", option that provides the CIVS to casual bird watchers that prefer to sit quietly and watch the scenery. However, for enthusiastic or asset birdwatchers, as mentioned by Cantu et al. (2011), there are attractions located in *Pinus-Quercus* forest that extending throughout in the area, where it can find

most of the endemics species, semiendemics and quasiendemics, in addition to the more difficult species to be observed, like birds that inhabit this forest which mostly have less than 20 cm, have different hideouts and remain perched on trees measuring between 20 and 30 meters high.

The location of CIVS San Cayetano is also advantageous to attract foreign visitors, as it is located less than two hours from Federal District (DF), capital of the country, with airport with more national operations (ASA 2003) and as the third largest receiver of American tourists in Mexico (SECTUR 2008. Cited by Cantú et al. 2011). Also for those who like to be in touch with nature, the CIVS has camping areas and cabins, although as mentioned by Melo and Contreras (1974) and by our own observation, these suffer from a lack of important maintenance. One option that requires less time for uncommitted bird watchers, would devote one or two days during the weekend (Cantú et al. 2011) to birding.

So in the CIVS San Cayetano, bird watchers could be one of the best options to support the development and sustainable management of natural resources, by providing an income by taking advantage of birdlife, as they currently are a key group within tourism and most are aware of the need to protect the environment (Ceballos-Lascuráin 1996, Cordell and Herbert 2002).

CONCLUSIONS

- I. The road density estimated for the CIVS San Cayetano exceeds the recommended for conservation and forestry areas, so it is important to conduct studies on the appropriate density for an area with the purpose and characteristics of this.
- II. The total richness of bird species considering previous studies and the results of this research amounts to 88, five are endangered species according to NOM-059-SEMARNAT-2010, six are endemic, four quasiendemics, four semiendemics and eight have a use as songbirds and ornamental species, so that at least 30% of species have attributes that birders might appreciate.

III. The plant community in which the greatest number of species was observed is the *Pinus-Quercus* forest, besides being the type of vegetation that occupies 70% of the total area of the CIVS.

IV. Of all the birds, only 8% are easy to observe, 55% are difficult to observe and the rest are intermediate.

V. The CIVS San Cayetano has a location that could attract a wide variety of tourists, from those who are looking to get in touch with natural environments without moving away substantially from the big cities of central Mexico, or to professional bird watchers, dedicated and interested in economically supporting conservation in places with facilities focused to observation of peculiar species.

VI. Among the recommendations it is suggested that there should be further monitoring planning and studies for birds group, in order to establish the total richness of species that inhabit the CIVS San Cayetano. Also it is necessary to do activities that consider neighbouring human communities and raise awareness of the value of diversity of species around this research centre. These elements could be the basis of projects to diminish the obvious deforestation to which it is subject, since it is not only the habitat of resident and migratory birds, but also provides other ecosystem services that are used by the villagers, plants or animals in the area.

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APPENDIX

Appendix 1. Species list of birds recorded by different authors for CIVS San Cayetano and attributes of some of them. Reported by: (L) Leon *et al.* 2015; (S) Segundo y García (2001); (O) Oñate-Ocaña y Herróz-Zamorano (2009). Status: (E) endemic; (C) quasiendemic; (S) semiendemic; (M) migratory; (R) resident; (RM) resident-migratory. Hazard Class: (T) Threatened; (Sp) Special protection. Easy to be observed: (E) Easy observation; (D) Difficult observation.

Species / Synonymy	Common name	Register by author	Status and risk category	Easy to be observed
<i>Anas platyrhynchos</i> (Linnaeus 1758).	Mallard	S	R	
<i>Spatula discors</i> / <i>Anas discors</i> (Linnaeus 1758).	Blue-winged Teal	S	M	
<i>Tachybaptus dominicus</i> (Linnaeus 1758).	Least Grebe	L	RM, Sp	
<i>Ardea alba</i> (Linnaeus 1758).	Great Egret	L	RM	E
<i>Bubulcus ibis</i> (Linnaeus 1758).	Cattle Egret	L	R	
<i>Cathartes aura</i> (Linnaeus 1758).	Turkey Vulture	L, O	RM	E
<i>Buteogallus anthracinus</i> (Deppe 1830).	Common Black-Hawk	L	R, Sp	E
<i>Buteo albonotatus</i> (Kaup 1847).	Zone-tailed Hawk	L	R, Sp	E
<i>Buteo jamaicensis</i> (Gmelin 1788).	Red-tailed Hawk	L, S	R	E
<i>Falco sparverius</i> (Linnaeus 1758).	American Kestrel	L	RM	
<i>Falco mexicanus</i> (Schlegel 1851).	Prairie Falcon	S	M, T	
<i>Columba livia</i> (Gmelin 1788).	Rock Pigeon	S	R	
<i>Columbina inca</i> (Lesson 1847).	Inca Dove	L, S, O	R	
<i>Geococcyx californianus</i> (Lesson 1847).	Lesser Roadrunner	S	R	
<i>Tyto alba</i> (Scopoli 1769).	Barn Owl	S	R	
<i>Bubo virginianus</i> (Gmelin 1788).	Great Horned Owl	S	R	
<i>Hylocharis leucotis</i> (Vieillot 1818).	White-eared Hummingbird	L, S, O	R	E
<i>Amazilia beryllina</i> (Lichtenstein 1830).	Berylline Hummingbird	L	R	D
<i>Lampornis amethystinus</i> (Swainson 1827).	Blue-throated Hummingbird	L	R	D
<i>Trogon mexicanus</i> (Swainson 1827).	Mountain Trogon	L, S	R	E
<i>Melanerpes formicivorus</i> (Swainson 1827).	Acorn Woodpecker	L, S	R	
<i>Picoides villosus</i> (Linnaeus 1766).	Hairy Woodpecker	L, S, O	R	E
<i>Mitrephanes phaeocercus</i> (Sclater 1859).	Tufted Flycatcher	L, S	R	D
<i>Contopus</i> sp	Pewee	L		D
<i>Lanius ludovicianus</i> (Linnaeus 1766).	Loggerhead Shrike	S	RM	
<i>Empidonax fulvifrons</i> (Giraud 1841).	Buff-breasted Flycatcher	L	R	D
<i>Sayornis nigricans</i> (Swainson 1827).	Black Phoebe	L	R	
<i>Sayornis saya</i> (Bonaparte 1825).	Say's Phoebe	L, S	RM	
<i>Pyrocephalus rubinus</i> (Boddaert 1783).	Vermilion Flycatcher	L, S	RM	D
<i>Myiarchus</i> sp	Flycatcher	O		

Species / Synonymy	Common name	Register by author	Status and risk category	Easy to be observed
<i>Tyrannus vociferans</i> (Swainson 1827).	Cassin´s Kingbird	L, S	R, S	
<i>Pachyramphus aglaiae</i> (Lafresnaye 1839).	Rose-throated Becard	L, S	R	D
<i>Vireo bellii</i> (Audubon 1844).	Bell´s Vireo	L	M	D
<i>Vireo solitarius</i> (Wilson 1810).	Blue-headed Vireo	L	M	D
<i>Vireo huttoni</i> (Cassin 1851).	Hutton´s Vireo	S, O	R	
<i>Vireolanius melitophrys</i> (Bonaparte 1850).	Chestnut-sided Shrike-Vireo	S	R, C	
<i>Cyanocitta stelleri</i> (Gmelin 1788).	Steller Jay	L, S, O	R	
<i>Tachycineta thalassina</i> (Swainson 1827).	Violet-green Swallow	L	R	E
<i>Hirundo rustica</i> (Linnaeus 1766).	Barn Swallow	L, O	RM	D
<i>Poecile sclateri</i> / <i>Parus sclateri</i> (Kleinschmidt 1897).	Mexican Chickadee	L	R, C	D
<i>Psaltriparus minimus</i> (Townsend 1837).	Bushtit	L, O	R	D
<i>Sitta carolinensis</i> (Latham 1790).	White-breasted Nuthatch	S, O	R	
<i>Certhia americana</i> (Bonaparte 1838).	Brown Creeper	L, S	R	D
<i>Campylorhynchus megalopterus</i> (Lafresnaye 1845).	Gray-barred Wren	L	R, E	D
<i>Troglodytes aedon</i> (Vieillot 1808).	House Wren	L, S	M	
<i>Regulus caléndula</i> (Linnaeus 1766).	Golden-creowned Kinglet	L, S, O	M	
<i>Sialia sialis</i> (Linnaeus 1766).	Eastern Bluebird	L	R	D
<i>Sialia mexicana</i> (Swainson 1827).	Western Bluebird	L, S	R	D
<i>Myadestes occidentalis</i> / <i>Myadestes obscurus</i> (Stejneger 1882).	Brown-backed Solitaire	L, O	R, Sp	E
<i>Catharus occidentalis</i> (Sclater 1859).	Russet Nightingale	L	R, E	D
<i>Catharus guttatus</i> (Pallas 1811).	Hermit Thrush	S	R	
<i>Turdus assimilis</i> (Cabanis 1850).	White-throated Thrush	L	R	D
<i>Turdus migratorius</i> (Linnaeus 1766).	American Robin	L, S, O	R	E
<i>Toxostoma curvirostre</i> (Swainson 1827).	Curve-billed Thrasher	L, S	R	
<i>Peucedramus taeniatus</i> (Du Bus De Gisignies 1847).	Olive Warbler	L	R	D
<i>Oreothlypis celata</i> / <i>Vermivora celata</i> (Say 1823).	Orange-crowned Warbler	L, O	M	D
<i>Oreothlypis superciliosa</i> / <i>Parula superciliosa</i> (Hartlaub 1844).	Crescent-chested Warbler	L	R, E	D
<i>Setophaga magnolia</i> / <i>Dendroica magnolia</i> (Wilson 1811).	Magnolia Warbler	S	M	
<i>Setophaga coronata</i> / <i>Dendroica coronata</i> (Linnaeus 1766).	Yellow-rumped Warbler	L	M	D
<i>Setophaga townsendi</i> / <i>Dendroica townsendi</i> (Townsend 1837).	Townsend´s Warbler	L, O	M	D

Species / Synonymy	Common name	Register by author	Status and risk category	Easy to be observed
<i>Setophaga occidentalis</i> / <i>Dendroica occidentalis</i> (Townsend 1837).	Hermit Warbler	L	M	D
<i>Mniotilta varia</i> (Linnaeus 1766).	Black-and-white Warbler	L	M	D
<i>Parkesia noveboracensis</i> / <i>Seiurus noveboracensis</i> (Gmelin 1789).	Northern Waterthrush	S	M	
<i>Cardellina pusilla</i> / <i>Wilsonia pusilla</i> (Wilson 1811).	Wilson's Warbler	L, S	M	D
<i>Cardellina rubra</i> / <i>Ergaticus ruber</i> (Swainson 1827).	Red Warbler	L, O	R, E	D
<i>Myioborus pictus</i> (Swainson 1827).	Painted Redstart	O	R	
<i>Myioborus miniatus</i> (Swainson 1827).	Slate-throated Redstart	L, S	R	D
<i>Basileuterus rufifrons</i> (Swainson 1827).	Rufous-capped Warbler	O	R, C	D
<i>Basileuterus belli</i> (Giraud 1841).	Golden-browed Warbler	L, S	R	
<i>Atlapetes pileatus</i> (Wagler 1831).	Rufous-capped Brush-Finch	L, S, O	R, E	E
<i>Pipilo maculatus macronyx</i> / <i>Pipilo erythrophthalmus macronyx</i> (Linnaeus 1758).	Spotted Towhee	L	R	D
<i>Melospiza fusca</i> / <i>Pipilo fuscus</i> (Swainson 1827).	Canyon Towhee	S	R	
<i>Atlapetes virenticeps</i> / <i>Buarremon virenticeps</i> (Bonaparte 1855).	Green-striped Brush-Finch	L	R, E	D
<i>Oriturus superciliosus</i> (Swainson 1837).	Striped Sparrow	L	R	
<i>Spizella passerina</i> (Bechstein 1798).	Chipping Sparrow	S	RM	D
<i>Melospiza melodia</i> (Wilson 1810)	Song Sparrow	L, S	R	D
<i>Junco phaeonotus</i> (Wagler 1831).	Yellow-eyed Junco	L, S, O	R, C	E
<i>Pheucticus melanocephalus</i> (Swainson 1827).	Black-headed Grosbeak	S	M, S	
<i>Agelaius phoeniceus</i> (Linnaeus 1766).	Red-winged Blackbird	O	R	
<i>Molothrus aeneus</i> (Wagler 1829).	Bronzed Cowbird	L, S	R	
<i>Icterus cucullatus</i> (Swainson 1827).	Hooded Oriole	S	RM, S	
<i>Icterus bullockii</i> (Swainson 1827).	Bullock's Oriole	L	RM, S	D
<i>Haemorhous mexicanus</i> / <i>Carpodacus mexicanus</i> (Müller 1776).	House Finch	L, S	R	D
<i>Spinus psaltria</i> / <i>Carduelis psaltria</i> (Say 1823).	Lesser Goldfinch	L, O	R	
<i>Piranga flava</i> (Vieillot 1822).	Hepatic Tanager	L	R	D
<i>Piranga rubra</i> (Linnaeus 1758).	Summer Tanager	L	M	D
<i>Piranga bidentata</i> (Swainson 1827)	Flame-colored Tanager	L	R	D
<i>Passer domesticus</i> (Linnaeus 1758).	House Sparrow	L, S	R	D