Nota científica

Further contributions on the description of the nest, eggs and nesting habitat of the Mexican micro-endemic and near threatened Rose-bellied Bunting (*Passerina rositae*)

Alan Monroy-Ojeda,[1]* Manuel Grosselet,[2] and Georgita Ruiz.[2]

[1]Avenida Pajaritos 33, Tres Pasos, Xalapa, Veracruz, 61943, Mexico. E-mail: *alanmonroy_ojeda@yahoo.com.mx
[2]Tierra de Aves, AC. Colina 145, Lomas de Bezares, 11910, Mexico City, Mexico.

Abstract
While assessing species density, abundance, and distribution through transects and point counts for the near threatened species Rose-bellied Bunting, *Passerina rositae*, we found two active nests on two hillsides characterized by tropical dry deciduous forest on the western slope of its restricted range in the Sierra Tolistoque, in the Isthmus of Tehuantepec, Oaxaca, Mexico. In both cases, we found no evidence of human disturbance and no proximate trail systems. This description adds further details of previous nest descriptions. These new findings have conservation implications due to the fact that original habitat degradation is rapidly occurring, not only due to cattle pastures, croplands, orchards, and human settlements, but also to a fast growing wind farm and highway development projects in the region.
Keywords: Mexican birds, breeding, Sierra de Tolistoque, Oaxaca.

Contribuciones adicionales para la descripción del nido, huevos y hábitat de anidación del colorín vientre rosado (*Passerina rositae*), una especie mexicana micro endémica y amenazada

Resumen
Durante un estudio sobre densidad, abundancia y distribución del colorín vientre rosado (*Passerina rositae*), una especie amenazada, a través de registros por trayecto y puntos de conteo, encontramos dos nidos activos en dos laderas dentro de la selva tropical caducifolia, en la vertiente oeste de la Sierra de Tolistoque en el Istmo de Tehuantepec, Oaxaca, México. En ambos nidos, no encontramos evidencia de disturbios humanos, ni de senderos de acceso cercanos. Esta descripción aporta nueva información sobre lo descrito anteriormente y tiene implicaciones en la conservación de la especie debido a la rápida degradación de su hábitat que ocurre, no solo debido al pastoreo, agricultura de temporal, huertos y asentamientos humanos, sino también por el incremento acelerado de proyectos de desarrollo de parques eólicos y autopistas en la región.
Palabras claves: aves mexicanas, reproducción, Sierra de Tolistoque, Oaxaca.

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Introduction

The Rose-bellied Bunting (*Passerina rositae*) is a micro-endemic cardinalid bird found only in a small range in southeastern Mexico (Howell and Webb 1995, AOU 1998). It inhabits swamp forest, denser portions of deciduous forests, arid to semiarid thorn forests, and semi humid deciduous gallery woodlands within hilly areas at 150-800 m a.s.l. in the southern part of the Isthmus of Tehuantepec region. Its distribution range is from west of the areas of Chivela, Matías Romero, and Juchitán including the Sierra Tolistoque in Oaxaca and extreme southwestern Chiapas (Binford 1989, Howell and Webb 1995, González-Ortega *et al*. 2002, IUCN 2012). According to IUCN the species is classified as near threatened (IUCN 2012). The Mexican legislation (SEMARNAT 2010) acknowledges the pressure that adversely affects the species and classified it as threatened. The criteria used to designate it as threatened include its small range and the possibility that its populations may be in decline owing to habitat degradation, human extraction, hurricane side-effects, and infrastructure development (Arizmendi 2006).

Due to concerns about the present and future conservation of the species and following recommendations of the IUCN (2012), we initiated a survey to assess species density, abundance, and distribution of the Rose-bellied Bunting in the Sierra Tolistoque, as well as a study of the ecology and habitat use by this species. During the surveys, we incidentally found two nests on a hillside characterized by tropical dry deciduous forest.

Crossin and Petit (1962) published a short note with the first description of the nest and eggs of the species, and recently Pérez-Sánchez *et al.* (2011) gave detailed characteristics of 15 nests found in the same area, including additional information on the eggs and nesting habitat. Here, we provide further contributions on details not previously described of the nest, eggs, and nesting habitat of the Rose-bellied Bunting.

Methods

Study area

We conducted transects and point counts in the western part of the distributional range of the Rose-bellied Bunting, specifically in the Sierra Tolistoque (altitudinal range 150-800 m a.s.l.; Binford 1989), in the Isthmus of Tehuantepec, Oaxaca, municipality of Juchitán. This region is characterized by a warm sub-humid climate (Aw, Cwa), with average annual temperature of 27.4°C. Tropical dry deciduous forests and semi-deciduous forest along effluents and alluvial plains originally covered the area. Tropical dry deciduous forests are present along hills and have an average canopy height of 7 m. The majority of trees drop their leaves for five to eight months of the year (Rzedowski 2006, Pérez-Sánchez *et al.* 2011). In the area, tropical dry semi-deciduous forests exist in the lower proportion, restricted mainly to ravines and alluvial plains where relative humidity is higher (INEGI 2000, Rzedowski 2006). Original vegetation in the region is being transformed into cattle pastures, croplands, orchards, human settlements, and wind farms, resulting in its loss and fragmentation (INEGI 2000, Trejo and Dirzo 2002, Flores-Mondragón 2007).

Sampling

Between late May and June 2012, we conducted point counts (n=209) throughout the Sierra Tolistoque. We sampled different vegetation types and topographic features including plains (n=27), foothills (n=29), hillsides (n=86) and ravines (n=67). We sampled based on the area of each topographic feature of the Sierra. We assessed the density and abundance of several resident species with no active protocol incorporated for nest searching. Even when the main objective was not focused on locating nests, we brought callipers, metric tape, and a photographic camera in the event one was discovered.

The nests found coincided with the line transect that the observer was following. Since the adopted sampling method did not allow the observer to return to the site where the nests had been located, the observer recorded nest measurements as quickly as possible to minimize the effect of human presence on the adult birds. The observer manipulated neither the nests nor the eggs.

Measurements

In an attempt to replicate methods used by Pérez-Sánchez *et al.* (2011), we recorded all materials used for nest construction. Using a manual calliper, we measured internal depth, internal diameter and external height. Using metric tape, we measured the height of the plant on which the nest was constructed, diameter at the base of the plant and distance from the upper part of the nest to the ground. For habitat description purposes, we estimated the percentage of exposed rock in a plot of 10 x 10 m and recorded the slope exposure, type of vegetation, and elevation.

While recording the nests, we did not take leaves or fruits of the plant where the nest was constructed to avoid leaving some sort of odour that could attract potential predators. The nests and plants were photographed and plant samples of nearby individuals of the same species were collected. Samples aided in the identification of the materials used in the construction of the nests, as well as the plants on which the nests were constructed.

Results

We discovered the first nest on June 6th, 2012. We found it on a hillside (16º35'43"N, 94º51'59"W; 312 m a.s.l.), constructed on the branch bifurcation of a dead plant (Figure 1; <www.youtube.com/watch?v=6lsdFkpv3mE>). We could not identify the plant species where the nest was constructed because it had no leaves, flowers or seeds. The diameter at the base of the plant was 2.5 cm and it had an approximate height of 1 m. The nest was located 44 cm above the ground and half a meter above it was a large trunk of a fallen tree providing the nest with some shade. No dense vegetation in the understory gave special shelter to the nest. The hillside where the nest was found had an east exposure with a pronounced slope (30-45%). Both the internal and external aspects of the nest resembled a slightly elliptical shape. The nest dimensions were: internal diameter 52.4 mm x 55.2 mm, 65.6 mm internal depth, and 123.5 mm external height. An acute angle was formed between the nest mouth and the ground surface, counteracting the descending slope of the terrain. The nest contained four eggs. The eggs had a whitish coloration with light brown spots mainly concentrated on the broader base. The nest was active and both assumed parents were observed vocalizing in the proximity.

We found the second nest on June 7th, 2012. It was also located on another hillside (16º35'48"N, 94º51'38"W; 285 m a.s.l.) 757 m west to the first nest in straight line. It was constructed on a branch bifurcation of a jacquinia shrub (*Jacquinia nervosa*, Theophrastaceae) (Figure 2). The diameter at the base of the jacquinia was 8.5 cm and it had an approximate height of 3.4 m. The nest was located 1.5 m above the ground. The hard, tough and needle-like tips of the leaves of the jacquinia gave a

dense shelter to the nest. No other dense vegetation in the understory surrounded the nest. The hillside where the nest was found had a southwest exposure with a slight slope (5-15%). Within a 50 m radius from the nest, there were several ponytail palms (*Beaucarnea recurvata*), measuring on average 7 m in height. Both the internal and external aspects of the nest resembled an almost perfect circle. The dimensions were: internal diameter 57.1 mm x 55.3 mm, 67.9 mm internal depth, and 111.1 mm external height. The nest mouth formed a perpendicular angle to the ground surface in accordance to the slight slope of the terrain. The nest contained three eggs, very similar in size and coloration to those found in the first nest. The nest was active and both assumed parents were observed vocalizing in the proximity. We did not observed potential predators while measuring the nests.



Figure 1. First Rose-bellied Bunting nest found in a hillside, Sierra de Tolistoque, Oaxaca.



Figure 2. Second Rose-bellied Bunting nest found in a hillside, Sierra de Tolistoque, Oaxaca.

In both nests, the main external materials consisted on different types of thin twigs, pony tail palm leaves (*B. recurvata*), grass stems, spider webs, tree bark of some species of *Bursera* (Burseraceae), snakeskin, among others. Thin twigs and a couple of feathers were the main components of the internal part of the nest. The interlaced twigs resembled an almost perfect inverted dome.

The main vegetation type along both hillsides was tropical dry deciduous forest (INEGI 2005). The area has a well-preserved status with no evidence of human disturbance and no proximate trail systems. The terrain had a land cover of approximately 30% exposed limestone rock. In both cases, the closest distance to the closest ravine was approximately 210 m.

Discussion

Compared to the descriptions provided by Pérez-Sánchez *et al.* (2011), our nest measurements and details of the eggs and nest materials are very similar, with the exception that we found that the species also uses ponytail palm leaves as an important nest material. Another difference is that they found all 15 nests in ravines with tropical semi deciduous forest, while we found the two nests on hillsides with tropical dry deciduous forest and none in ravines. Although the main objective of our study was not nest searching or nest description and nesting habitat, we did assess the densities of singing Rose-bellied Bunting males throughout the Sierra Tolistoque and found no major concentration of the species in ravines during the breeding season (unpublished data).

Pérez-Sánchez *et al.* (2011) suggested that the species prefers ravines for nesting habitat based on the number of nests they found. However, Pérez-Sánchez *et al.* (2011) focused mainly its nest searches on ravines (Ian MacGregor, pers. comm.).

Based on the fact of previous lack of prospection on other types of topographic features and our recent findings, we suggest that the Rose-bellied Bunting may use a broader range of topographical features for nesting sites, rather than mostly using ravines as advocated by Pérez-Sánchez *et al.* (2011). We state that due to the characteristics of the terrain, it is easier to sample ravines and therefore increasing the probabilities of finding nests there, biasing the perception of where concentrations of nests are found. We also suggest that the species prefers sites with high percentage of naturally exposed rock, as our observation might suggest.

Rose-bellied Bunting uses both major types of vegetation (tropical dry deciduous and semi deciduous forest) present in the Sierra Tolistoque for nesting, but the two nests that we found were located only in well-preserved sites. Considering the prevalent problems of forest loss and landscape transformation (Trejo and Dirzo 2002, Flores-Mondragón 2007), we support the idea that

conservation efforts in the area must include, not only ravines where habitat is well-preserved, but also, all remaining forested areas of the region, in order to ensure the protection of this species during the breeding season. This would also help protect other threatened and emblematic species, such as the ponytail palm (*B. recurvata*), amongst many others.

The natural habitat of the Rose-bellied Bunting is currently under pressure causing its rapid transformation as a result of the booming multiplication of wind farm projects in the region. For the sake of sound management and conservation, both for the habitat and for the species, it is important to have good information about the natural history and vital requirements of this endemic species, found only in a very restricted range in a particular habitat in the Isthmus of Tehuantepec of Oaxaca and Chiapas, Mexico. It is very important, not only to understand the real needs and habitat use of this species, but to have the information published for reference. Official guidelines for change of land use for infrastructure projects require environmental assessments, which in turn must refer to the literature published on the subject. If there is little or no such information available, or if the information available is misleading, the implications to the species may be catastrophic due to authorizations for the transformation and destruction of such vital habitat.

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