SOLITARY EAGLE CONSERVATION PROJECT

Belize Raptor Research Institute

2011-2012 Report

BELIZE RAPTOR RESEARCH INSTITUTE

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Submitted to:
Belize Forest Department
Submitted by:
Belize Raptor Research Institute
Ryan Phillips | Executive Director

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Abstract

The enigmatic Solitary Eagle *Harpyhaliaetus solitarius* (SOEA), in acute need of research and conservation measures, is listed as Critically Endangered in Belize (Meerman 2005) and Near Threatened by the International Union for Conservation of Nature (IUCN) with global population estimates of 250-1000 individuals (Birdlife International 2012). This project has and will continue to gain vital data on the Solitary Eagle through nest monitoring and radio-telemetry, the first such study for the species, with assessment and recommendations for impending conservation action. In mid-2011, our Belize Raptor Research Institute (BRRI) Field Manager, Roni Martinez, with assistance from personnel working for The Peregrine Fund discovered the only known active nest for this species, presenting us with a rare and urgent opportunity. Following this discovery, three months of data was collected at the nest-site during the end of the nestling period to the dispersal period of the juvenile. Information on nesting behaviors, prey, habitat usage, nestling period and fledging period were collected establishing baseline knowledge of this virtually unknown species. While this represents an important start, in the future Belizeans and international students will be trained in field research and stewardship, while using this charismatic keystone species in conservation education and outreach to local communities.

Introduction

Neotropical raptors are in critical need of study as basic natural history information on the nests, eggs, home range, area requirements, demographics and movements of over half are unknown (Cade 1989, Bierregaard 1995, Bildstein et al. 1998). The Solitary Eagle, *Harpyhaliaetus solitarius*, has a patchy distribution from western Mexico to northwest Argentina where it is a very rare and local resident throughout (Ferguson-Lees and Christie 2001). It is among the least known raptors found in Central America and therefore a priority species.

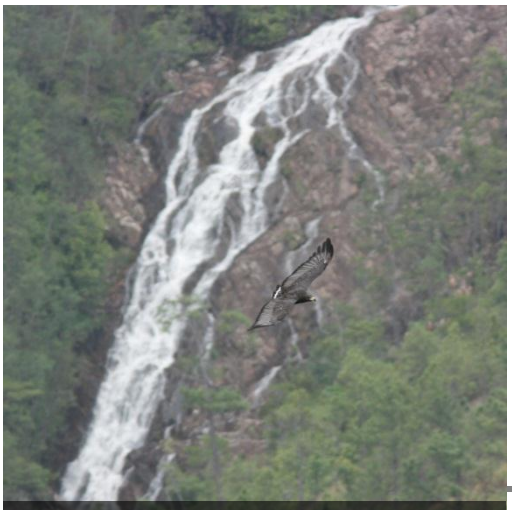


Figure 1. Adult female Solitary Eagle soaring over nest. Ryan Phillips

Throughout the Solitary Eagle's distribution, there are fewer than 80 confirmed records between the 1800's and today. It is currently classified as "Near Threatened" by the IUCN due to its modestly small population size, which is estimated to be between 250-999 individuals (Birdlife International 2012). Based on further evidence of population trends, the species may be up-listed to "Vulnerable". However, currently there is no data on the species to properly assess its status (Birdlife International 2012). In Belize it is listed as "Critically Endangered", which means it is vulnerable to becoming extinct (Meerman 2005). Although there have

been numerous reports from Belize, all but a few are from the Mountain Pine Ridge area where the first well-documented record occurred in 1997 by Steve Howell. This sighting, in 2004, was followed by the first photo documentation. While there have been numerous records from Belize, all but a few are from the Mountain Pine Ridge area. Outside of single records, only a few papers have ever been published on this species further exemplifying the importance of any studies on this vulnerable eagle.

The Belize Raptor Research Institute (BRRI) Solitary Eagle Conservation Project is centered in the Mountain Pine Ridge region of Belize in the Cayo District. The overarching goal of this project is to obtain data on the breeding biology and movements of this rare Neotropical eagle, as well as engaging local communities in raptor conservation, while giving them opportunities to study and protect their country's biodiversity.

Figure 2. Solitary Eagle nest discovered on 30 June 2011 with nestling. Roni Martinez

On 30 June 2011, Roni Martinez, BRRI Board member and Field Manager and Blancaneaux Lodge Conservation Officer, led a nest search team with assistance from The Peregrine Fund Orange-breasted Falcon Release Team members, Camille Meyers, Matt Allhouse, Stacia Novy, Audrey Martin, and Jonathan Urbina. They successfully located the only known, currently active, nest for this species, which according to the literature represents only the fourth discovered for the species across its entire distribution (one was found in 1947 and a second in 1956, but the adult birds were shot for museum specimens; a third nest was found in 2010 in Ecuador, but was deemed to be inactive in May 2012 by Manuel Sanchez, contracted by BRRI to observe the nest).

As the pair had a single chick (Fig. 2), this gave BRRI personnel the opportunity to collect the first breeding biology data on the species. This nest was monitored for 3 months from July through September 2011, which coincided with the end of the nestling and post-fledging periods. This was the first data collected on the nesting biology for the species. However, since the nest was located 1 month before the chick fledged, data on a full breeding cycle was not obtained. In 2013, upon approval from the Belize Forest Department, BRRI researchers will conduct observations on a full breeding cycle of this nest collecting over 3000 hours of observations, which will give us a good understanding of its breeding biology.

This long-term project seeks to obtain breeding biology data through nest monitoring during a full 9 month breeding cycle (January through September 2013) and radio-telemetry tracking for 3-5 years, or however long the transmitter's battery life span is. Additionally, data collection on

dispersal movements, populations in neighboring countries and identifying threats to the species, validates the Mesoamerican Biological Corridor and assists in multi-national conservation efforts, ultimately conserving viable Solitary Eagle populations. Recognizing that long-term success is dependent on local community engagement, a priority was given to train Belizeans in advanced field techniques and stewardship.

This information is critically necessary to inform resource managers about the urgent need to designate and conserve Belize's priority landscape. In 2011, the Belize Raptor Research Institute (BRRI) informed Programme for Belize (PFB) of the find and suggested working to preserve this land where the nest is located and also reached out to the World Land Trust (WLT) for assistance in establishing the first Solitary Eagle Nature Reserve. Preserving this land is a high priority for both conservation organizations, including BRRI. Obtaining data from this nest may assist in its preservation, as well as the protection of its habitat and the biodiversity within this region. This would be the first protected area designated for the preservation of the Solitary Eagle.

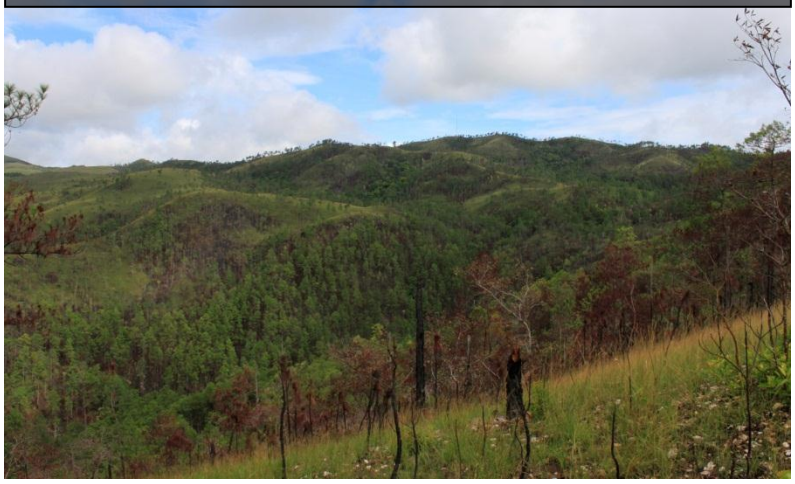
The BRRI is an established environmental non-profit that has the capacity for ongoing project management: including training and organizing personnel: and has a proven track record of successful outreach collaborations. One example of our effectiveness occurred after a fatal shooting of a juvenile Solitary Eagle in December 2011 (Fig. 3). Though an unfortunate incident, it proved to be a sad but fortuitous vehicle for BRRI and its partners (The Belize Zoo, Belize Bird Rescue and the Belize Forest Department) to reach out to the farming community to provide education about the value of apex carnivores and flagship species, as well as providing a means to engage the local, regional and international communities. This experience exhibited this species' potential for being an umbrella species for the Neotropical region.

Figure 3. Deceased juvenile Solitary Eagle from a gunshot wound. Nikki Buxton

Study Area

Located on the Caribbean coast and bordered by Mexico and Guatemala, Belize is home to a large number of rare and endangered species including the Jaguar, Baird's Tapir, and Harpy Eagle. With approximately 65% of its native forest still intact, this small Central American country is an ideal location for research and conservation efforts. Although the country currently has a small human population of fewer than 350,000 people, its various native habitats are coming under a greater threat of destruction now than ever before. Over the past 10 years, outside corporations have targeted pristine habitat for construction of dams and other large-scale projects that have had a very detrimental effect on wildlife. And this trend continues. Because of this, there is the risk that habitat for many rare or little studied species, such as the Solitary Eagle, will be destroyed before scientific and conservation efforts can be implemented. This study will be conducted within Belize's Mountain Pine Ridge Forest Reserve and surrounding private lands. The Mountain Pine Ridge Forest Reserve is managed by the Forest Department and consists of over 120,000 acres of sub-montane pine forest bordered by sub-montane broadleaf forest (Fig. 4).

Figure 4. Solitary Eagle habitat in the Mountain Pine Ridge. Ryan Phillips



Methods

Nest Monitoring

The SOEA nest discovered in June 2011 was monitored for 3 months between July and September 2011, until the juvenile left the nest area. Infrequent nest visits were made and the juvenile was last observed in November. A blind was set-up 70 meters from the nest, well camouflaged and concealed, to avoid any disturbance (Fig. 5). Nest-site attendants recorded all behaviors, including: prey exchanges, feedings, prey species, date chick fledges, adult/juvenile interactions, and juvenile behavior after fledging.

Figure 5. Nest monitoring blind. Ryan Phillips

Results

Since the discovery of the Solitary Eagle nest on 30 June 2011, we made 97 hours of observations of the nestling, fledgling, and dispersal periods. Prior to this study, there was only anecdotal information on the diet of the Solitary Eagle. Through direct observations of the nest we recorded twenty prey items brought to the nest by both the adult male and female (Fig. 7). Seventeen of the twenty prey items were snakes, and the other three were a single observation of a Nine-banded Armadillo, Striped Basalisk, and an unidentified mouse or rat (Fig. 8). This proves that they are specialized reptilian feeders, but will prey on the occasional mammal. The Tropical Rat Snake (*Spilotes pillatus*) and Brown Racer (*Dryadophis melanolomus*) were the two most abundant prey species, but a larger sample size is needed to determine how important these species are in their diet (Fig. 8).

Figure 6. Adult female Solitary Eagle soaring over nest. Ryan Phillips

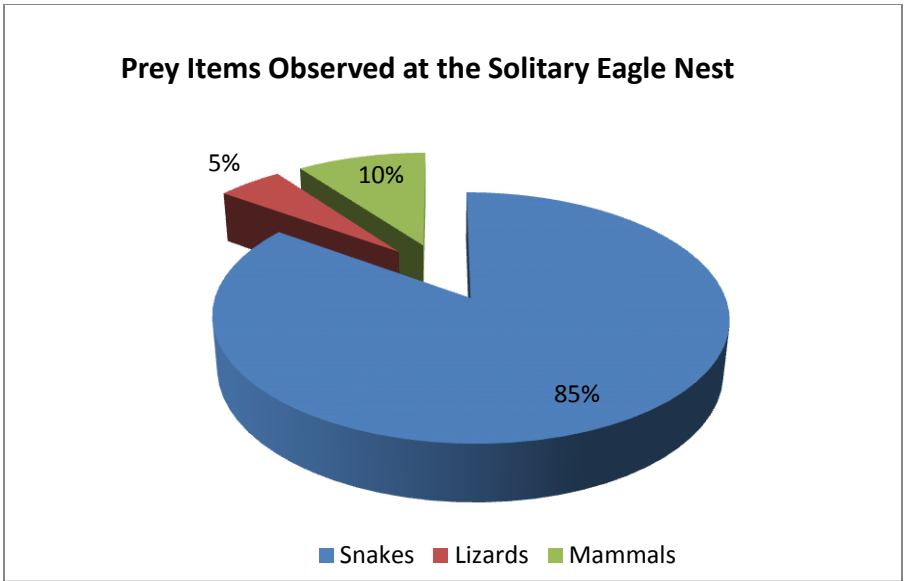


Figure 7. Prey items observed at the nest in 2011, n=20.

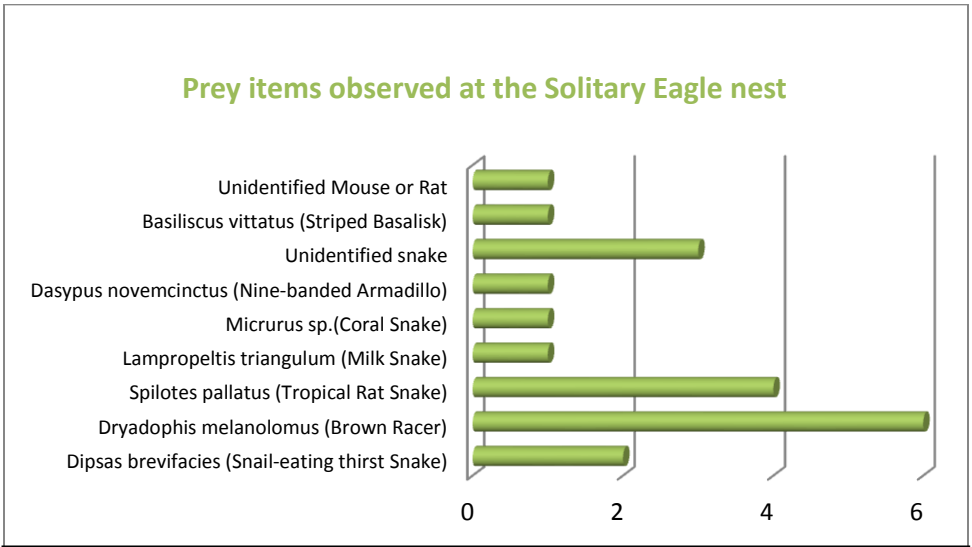


Figure 8. Prey items and number observed at the nest, n=20.

On the day the nest was discovered, the nestling appeared to be approximately two months old and was being fed by both parents. Adults would bring in prey to the nestling between 1-3 times per day, usually between 12:00 h-16:00 h. On one occasion, both the adult male and female came into the nest from the same direction at the same time each carrying a snake. On most occasions, the male and female would bring prey to the nest at different times; rarely were both adults observed at the nest at the same time. The female was observed near the nest more frequently.

Figure 9. Juvenile Solitary Eagle near fledging. Ryan Phillips

The nestling was first observed wing flapping, spreading its wings and lifting up off the nest, on 10 July. The nestling spent most of its day food begging or standing at the edge of the nest during the month of July (Fig. 9). On 4 August, the nestling made its first flight from the nest tree. We estimated the nestling fledged at approximately 3.5 months of age. For the next month, the juvenile was observed not more than 200 meters from the nest, frequently food begging. The adults continued to bring food to the nest, where the juvenile would fly once it heard the parents vocalizing. On 16 August, the juvenile began to look for prey. It was observed intently looking down at the ground at anything that moved. On 26 August, we observed its first attempt to catch prey when it attacked a Striped Basalisk, but it was unsuccessful. In September the juvenile moved about 1 kilometer from the nest and continued to be fed by the adults, but away from the nest. The juvenile was last observed in the area in November.

Discussion

Since a literature review suggests this was the first nest ever scientifically studied of this rare species, we decided not to radio-tag any of the individuals in 2011, in order not to disturb the nesting process as it was already late in the nesting cycle. Like other forest eagles of the Neotropics, we assume that the dependency period is at least 6 months after fledging, so we suspect they will not nest again until 2013. We observed no activity during multiple visits to the nest in 2012, suggesting that this eagle nests every other year, at most. In March 2012, with assistance from the Wildlife Conservation Society-Guatemala, we installed two security cameras, so that the nest can be monitored via a video surveillance system in 2013 when it is expected to be active again (Fig 10).

Figure 10. Marcial Cordova, WCS-Guatemala, climbing into the Solitary Eagle nest to install camera. Roni Martinez

Upon in-depth research, we learned that the owners of the land where the Solitary Eagle nest is located on is the Programme for Belize (PFB). The property was donated to PFB and is called Vachel Keene. We contacted PFB and are currently working with them and the World Land Trust-US to establish this land as the first Solitary Eagle Reserve to protect this critically endangered species, as well as its habitat and the many other species living there.

In 2013, we plan to radio-tag at least one adult from this nesting pair and a juvenile from the nest if this pair is successful when nesting again. The BRRI Advisory Board with over 300 years combined experience of raptor biology will be consulted on this endeavor.

Acknowledgements

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