

## **An Integrated Community-Based Harpy Eagle and Avian Conservation Program for the Maya Mountains Massif**

### **2007 Results submitted by:**

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### **Results of Project (Deliverables - Addendum):**

From part 2 of Project Report:

“A GIS database for BNR of Neo-tropical migratory and resident birds”

## Results:

We identified 271 bird species during year one of the project (five-month field season: Jan-May 2007). These species included both neotropical migratory and resident species, some of which were previously un-documented in the reserve. This intensive bird survey was the first of its kind in the Bladen Nature Reserve (BNR), and validated the previous bird studies that were done on a limited basis in this area in the past. Bird species were surveyed and identified by three methods: point counts, mist-net capture with mark-and-release (banding), and general observations. Table 1 provides a comprehensive list in taxonomical order of all bird species identified and also denotes species detected by mist-net and point count surveys. Table 2 contains the bird species detected by point counts and mist-nets only in alphabetical order. The 271 bird species identified during the project also includes three species designated as “near threaten” by the IUCN Red List of Threaten Species for Belize and the Maya Mountains. These species are: Harpy Eagle (*Harpia harpyja*), Great Curassow (*Crax rubra*), and Painted Bunting (*Passerina ciris*).

### *Species Diversity*

Bird species diversity was calculated by the Shannon Index from point count survey data using total bird detections across our three sites: Blue Pool, Cabrada de Oro, and Richardson Creek. The Blue Pool site had the highest species diversity at  $H = 3.99$ , followed by Cabrada de Oro with  $H = 3.64$ , and Richardson Creek with  $H = 3.47$ . To examine how evenly distributed species were at each site versus an uneven distribution (i.e., having several bird species that may have dominated, or been more common at a particular site) we calculated a measure for Evenness (E). A measure of 1.0 would indicate a site that is completely even in both the number of species and the abundance of those species. The Cabrada de Oro site had the highest Evenness score with  $E = 0.909$ , followed by both nearly equivalent scores at Richardson Creek,  $E = 0.879$  and Cabrada de Oro,  $E = 0.876$ .

### *Species Richness*

Bird species richness was also highest at our Blue Pool site with 95 bird species identified during our point count surveys. This was followed by Cabrada de Oro with 55 species and Richardson Creek with 52 species. To compare species richness over the three sites, we calculated mean bird species richness as the total number of species detected per point count station per site. This comparison showed that the three sites differed statistically by analysis of variance (ANOVA) with the Blue Pool site having the highest species richness ( $x = 36$ ) and differing from the Cabrada de Oro site ( $x = 15.2$ ), but not from our Richardson Creek site ( $x = 27$ )(Figure 1).

### *Species Abundances*

Relative Abundance was calculated from our point count data on a per site basis. The 10 most abundant species for each site comprised 42-54% of the birds detected. These species were from two major bird guilds, frugivores and insectivores, with some frugivores also seedeaters. Insectivores were approximately 1.5x more common than frugivores at both Blue Pool and Cabrada de Oro, while these guilds were detected in nearly equal numbers at Richardson Creek (Figure 2).

### *Species Accumulation Curves*

Species Accumulation Curves give an indication of how well one has sampled a particular site. The graph should begin with a steep curve initially as bird species are first identified, and gradually level off as fewer new birds are added to the site list. Eventually, when no new species can be added (i.e., all or nearly all species have been detected) this indicates that an accurate measure of the bird community has taken place. Our species accumulation curves indicate that we have only just begun to detect bird species at our site locations. Figure 3 shows curves for all three sites still rising and not leveling off. (Note: No sampling was done for the month of April at Cabrada and Richardson due to logistical constraints; therefore, those curves reflect missing data where they level off, and then rise again in May.) A good example of a constant rise in species accumulation is at the Blue Pool site (Figure 4). These curves all show a continual rise in species detection. This indicates that although our sampling went well this first year, we still need more data collection to better characterize the rich bird communities at these sites.

### *Banding Data*

One way to supplement our point count survey data is with data collected from our mark-recapture banding surveys. Our first year of banding yielded 453 birds captured, and we added an additional 36 species that were not detected by our point count surveys. During our two most productive months, we captured 102 migrants and 195 resident species. As a measure of how successful our banding was, it is typical to measure effort in birds captured per net-hour, where a net-hour equals one net open for one hour. For example if there are 5 nets open for 5 hours, this would equal 25 net-hours. We captured from 0.26 to 1.38 birds/net-hour. This is comparable with past monitoring efforts in the region.

### *Conclusion*

For our first year of data collection, we were able to detect several trends, including high bird species richness and species diversity at our monitoring sites, and differences in those levels among sites. Since Harpy Eagles are a top predator, and they have been

identified in areas which support high levels of biodiversity, we predicted that the BNR would have a rich bird community. So far our data show this; however, this is only our first year, and much more data still needs to be collected. For example, more surveys will enable us to detect a greater number of species, and our accumulation curves will show how well we are describing the bird community. Next, our mark-recapture data from our banding will allow us to determine a variety of demographic patterns such as survivorship and productivity, only possible with at least three seasons worth of data. Already, we have recaptured a good percentage of individuals at our sites, indicating site fidelity among wintering migrants, at least for this season, and residents as well. As we collect more data, we will be able to track species and determine species distribution in the landscape, and then directly relate these data to our Harpy Eagle monitoring and surveys.

Figure 1. Mean bird species richness calculated as the total number of species detected per point count station per site. Mean bird species richness: Blue Pool (x = 36), Richardson Creek (x = 27), Cabrada de Oro (x = 15.2). Sites differed significantly by ANOVA.

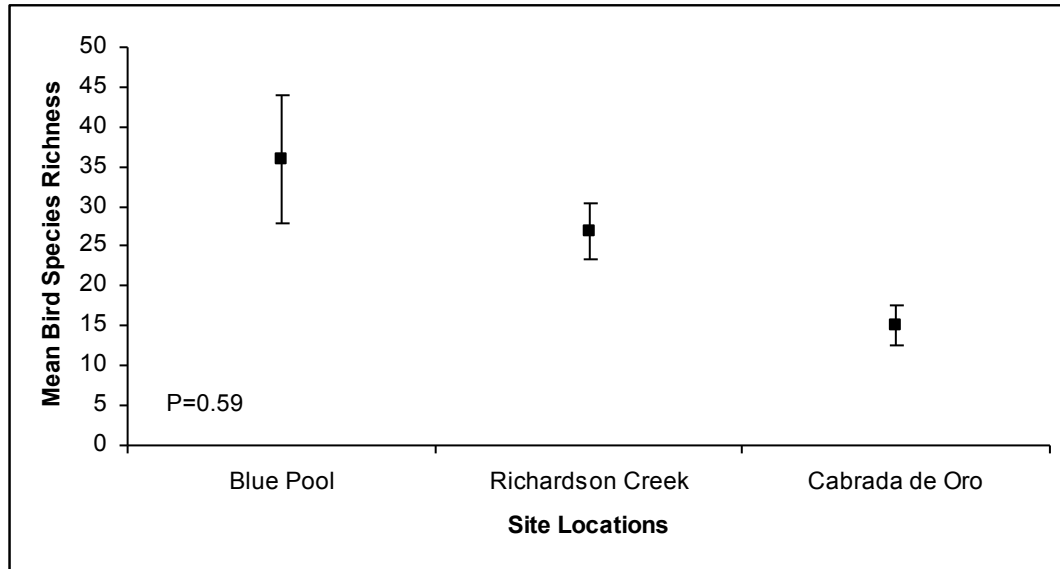


Figure 2.

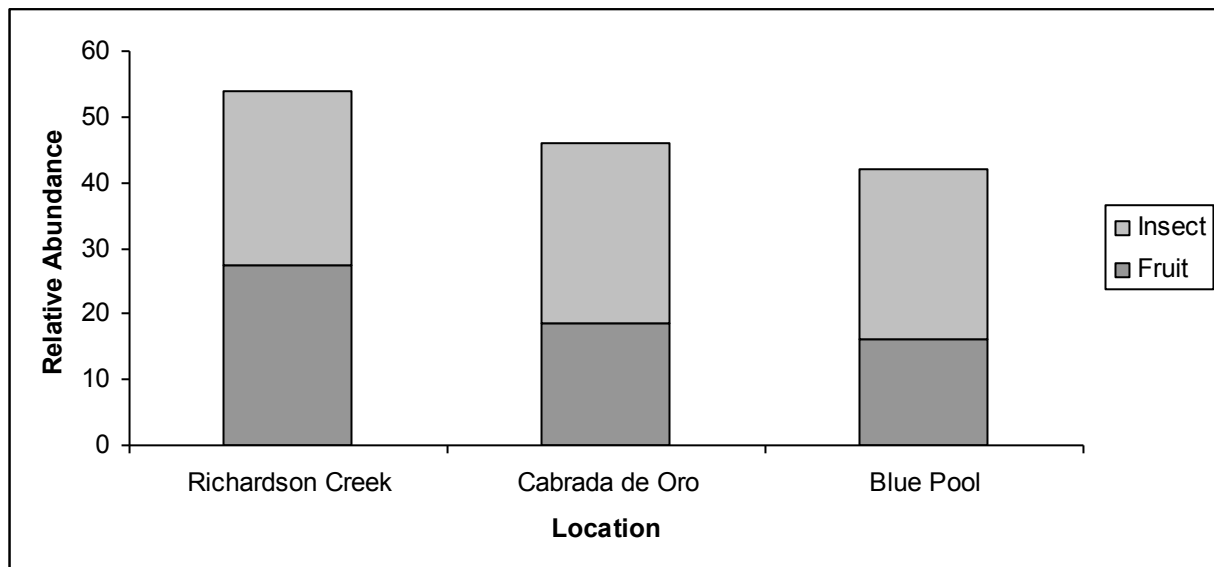


Figure 3.

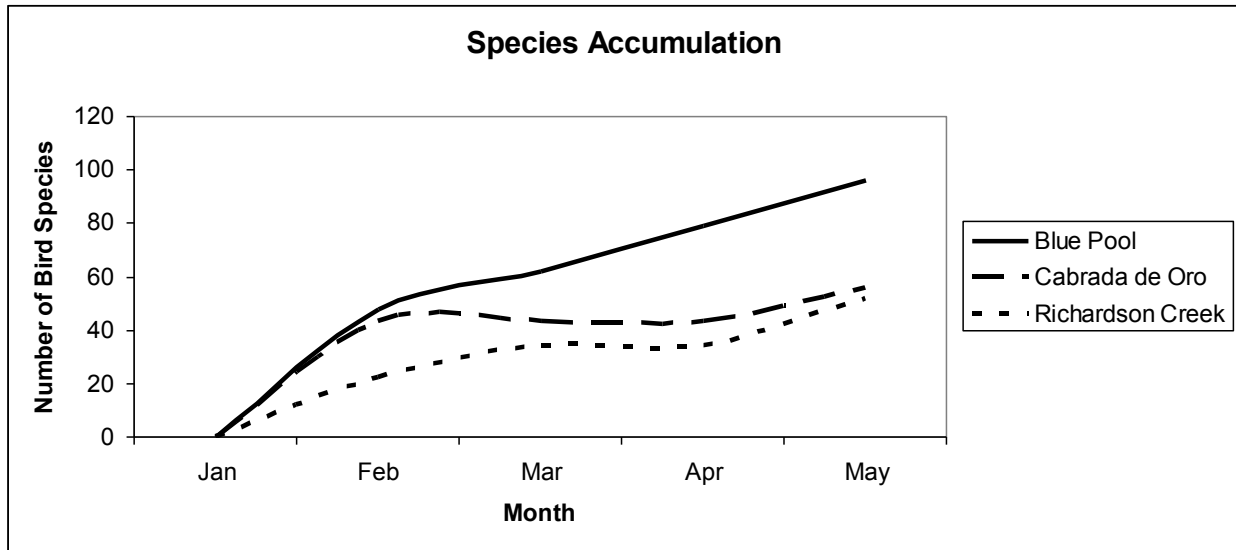


Figure 4.

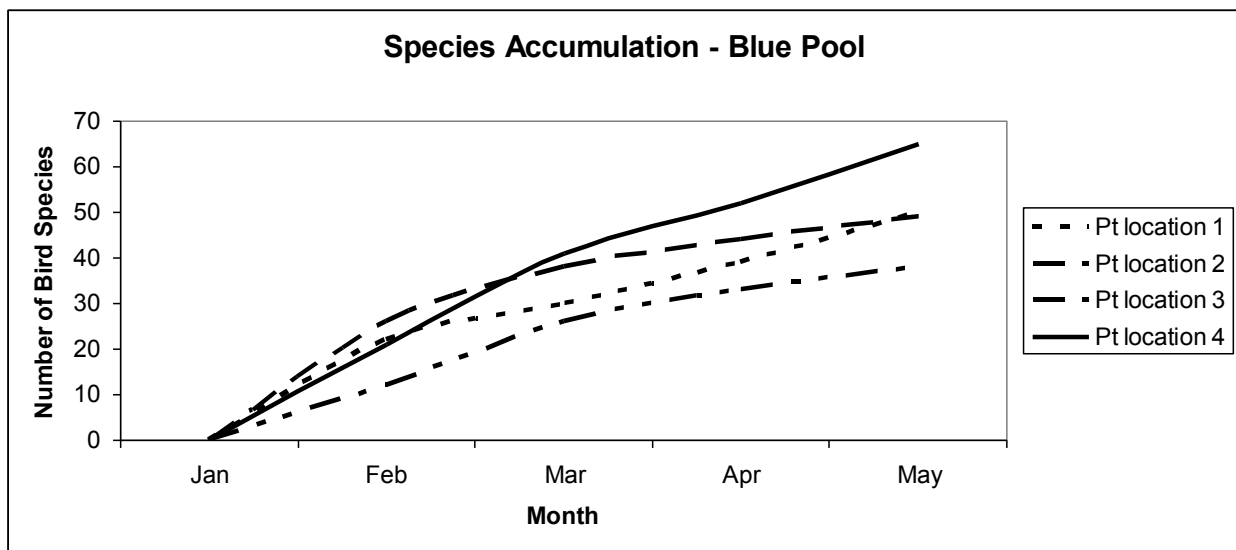


Table 1. Taxonomical list of all bird species detected. Those detected specifically by banding and/or point count surveys are indicated as well as the IUCN species.

Genus	Species	Common Name	Banding	Point Count	IUCN
<i>Tinamus</i>	<i>major</i>	Great Tinamou		x	
<i>Crypturellus</i>	<i>soui</i>	Little Tinamou		x	
<i>Crypturellus</i>	<i>boucardi</i>	Slaty-breasted Tinamou			
<i>Anhinga</i>	<i>anhinga</i>	Anhinga			
<i>Tigrisoma</i>	<i>mexicanum</i>	Bare-throated Tiger-Heron			
<i>Ardea</i>	<i>herodias</i>	Great Blue Heron			
<i>Ardea</i>	<i>alba</i>	Great Egret			
<i>Egretta</i>	<i>thula</i>	Snowy Egret			
<i>Egretta</i>	<i>caerulea</i>	Little Blue Heron			
<i>Bubulcus</i>	<i>ibis</i>	Cattle Egret			
<i>Butorides</i>	<i>virescens</i>	Green Heron			
<i>Agamia</i>	<i>agami</i>	Agami Heron			
<i>Nyctanassa</i>	<i>violacea</i>	Yellow-crowned Night-Heron			
<i>Cochlearius</i>	<i>cochlearius</i>	Boat-billed Heron			
<i>Mycteria</i>	<i>americana</i>	Wood Stork			
<i>Coragyps</i>	<i>atratus</i>	Black Vulture			
<i>Cathartes</i>	<i>aura</i>	Turkey Vulture			
<i>Sarcoramphus</i>	<i>papa</i>	King Vulture			
<i>Cairina</i>	<i>moschata</i>	Muscovy Duck			
<i>Anas</i>	<i>discors</i>	Blue-winged Teal			
<i>Pandion</i>	<i>haliaetus</i>	Osprey			
<i>Chondrohierax</i>	<i>uncinatus</i>	Hook-billed Kite			
<i>Elanoides</i>	<i>forficatus</i>	Swallow-tailed Kite			
<i>Harpagus</i>	<i>bidentatus</i>	Double-toothed Kite			
<i>Ictinia</i>	<i>plumbea</i>	Plumbeous Kite			
<i>Geranoospiza</i>	<i>caerulescens</i>	Crane Hawk			
<i>Leucopternis</i>	<i>albicollis</i>	White Hawk			
<i>Asturina</i>	<i>nitida</i>	Gray Hawk			
<i>Accipiter</i>	<i>striatus</i>	Sharp-shinned Hawk			
<i>Buteogallus</i>	<i>anthracinus</i>	Common Black-Hawk			
<i>Buteogallus</i>	<i>urubitinga</i>	Great Black-Hawk			
<i>Harpyhaliaetus</i>	<i>solitarius</i>	Solitary Eagle			
<i>Buteo</i>	<i>magnirostris</i>	Roadside Hawk	x		
<i>Harpia</i>	<i>harpyja</i>	Harpy Eagle			
<i>Spizastur</i>	<i>melanoleucus</i>	Black-and-white Hawk-Eagle			
<i>Spizaetus</i>	<i>tyrannus</i>	Black Hawk-Eagle			
<i>Spizaetus</i>	<i>ornatus</i>	Ornate Hawk-Eagle			
<i>Micrastur</i>	<i>ruficollis</i>	Barred Forest-Falcon			
<i>Micrastur</i>	<i>semitorquatus</i>	Collared Forest-Falcon			
<i>Herpetotheres</i>	<i>cachinnans</i>	Laughing Falcon		x	
<i>Falco</i>	<i>femoralis</i>	Aplomado Falcon			
<i>Falco</i>	<i>rufifularis</i>	Bat Falcon			
<i>Ortalis</i>	<i>vetula</i>	Plain Chachalaca			
<i>Penelope</i>	<i>purpurascens</i>	Crested Guan			
<i>Crax</i>	<i>rubra</i>	Great Curassow		x	x

<i>Odontophorus</i>	<i>guttatus</i>	Spotted Wood-Quail		
<i>Dactylortyx</i>	<i>thoracicus</i>	Singing Quail		
<i>Laterallus</i>	<i>ruber</i>	Ruddy Crake		
<i>Aramides</i>	<i>cajanea</i>	Gray-necked Wood-Rail		
<i>Heliornis</i>	<i>fulica</i>	Sungrebe		
<i>Aramus</i>	<i>guarauna</i>	Limpkin		
<i>Jacana</i>	<i>spinosa</i>	Northern Jacana		
<i>Tringa</i>	<i>solitaria</i>	Solitary Sandpiper		
<i>Actitis</i>	<i>macularia</i>	Spotted Sandpiper		
<i>Patagioenas</i>	<i>cayennensis</i>	Pale-vented Pigeon		
<i>Patagioenas</i>	<i>nigrirostris</i>	Short-billed Pigeon		x
<i>Columbina</i>	<i>talpacoti</i>	Ruddy Ground-Dove		
<i>Claravis</i>	<i>pretiosa</i>	Blue Ground-Dove		
<i>Leptotila</i>	<i>verreauxi</i>	White-tipped Dove		
<i>Leptotila</i>	<i>rufaxilla</i>	Gray-fronted Dove		
<i>Leptotila</i>	<i>cassini</i>	Gray-chested Dove	x	
<i>Geotrygon</i>	<i>montana</i>	Ruddy Quail-Dove	x	
<i>Aratinga</i>	<i>nana</i>	Olive-throated Parakeet		
<i>Ara</i>	<i>macao</i>	Scarlet Macaw		
<i>Pionopsitta</i>	<i>haematotis</i>	Brown-hooded Parrot		x
<i>Pionus</i>	<i>senilis</i>	White-crowned Parrot		x
<i>Amazona</i>	<i>albifrons</i>	White-fronted Parrot		x
<i>Amazona</i>	<i>autumnalis</i>	Red-lored Parrot		
<i>Amazona</i>	<i>farinosa</i>	Mealy Parrot		x
<i>Amazona</i>	<i>oratrix</i>	Yellow-headed Parrot		
<i>Coccyzus</i>	<i>americanus</i>	Yellow-billed Cuckoo		
<i>Piaya</i>	<i>cayana</i>	Squirrel Cuckoo		x
<i>Otus</i>	<i>guatemalae</i>	Vermiculated Screech-Owl		
<i>Glaucidium</i>	<i>griseiceps</i>	Central American Pygmy-Owl		
<i>Ciccaba</i>	<i>virgata</i>	Mottled Owl		
<i>Chordeiles</i>	<i>acutipennis</i>	Lesser Nighthawk		
<i>Chordeiles</i>	<i>minor</i>	Common Nighthawk		
<i>Nyctidromus</i>	<i>albicollis</i>	Common Pauraque		
<i>Nyctibius</i>	<i>jamaicensis</i>	Northern Potoo		
<i>Streptoprocne</i>	<i>zonaris</i>	White-collared Swift		
<i>Chaetura</i>	<i>vauxi</i>	Vaux's Swift		
<i>Phaethornis</i>	<i>superciliosus</i>	Long-tailed Hermit		
<i>Phaethornis</i>	<i>longuemareus</i>	Little Hermit		
<i>Phaeochroa</i>	<i>cuvierii</i>	Scaly-breasted Hummingbird		
<i>Campylopterus</i>	<i>curvipennis</i>	Wedge-tailed Sabrewing	x	x
<i>Campylopterus</i>	<i>hemileucurus</i>	Violet Sabrewing		
<i>Florisuga</i>	<i>mellivora</i>	White-necked Jacobin		
<i>Anthracothorax</i>	<i>prevostii</i>	Green-breasted Mango		
<i>Chlorostilbon</i>	<i>canivetii</i>	Canivet's Emerald		
<i>Thalurania</i>	<i>colombica</i>	Violet-crowned Woodnymph	x	
<i>Amazilia</i>	<i>candida</i>	White-bellied Emerald	x	x
<i>Amazilia</i>	<i>tzacatl</i>	Rufous-tailed Hummingbird	x	x
<i>Heliophryx</i>	<i>barroti</i>	Purple-crowned Fairy		x
<i>Archilochus</i>	<i>colubris</i>	Ruby-throated Hummingbird		



<i>Trogon</i>	<i>melanocephalus</i>	Black-headed Trogon			
<i>Trogon</i>	<i>citreolus</i>	Citreoline Trogon			
<i>Trogon</i>	<i>violaceus</i>	Violaceous Trogon		x	
<i>Trogon</i>	<i>collaris</i>	Collared Trogon			
<i>Trogon</i>	<i>massena</i>	Slaty-tailed Trogon		x	
<i>Momotus</i>	<i>momota</i>	Blue-crowned Motmot	x	x	
<i>Electron</i>	<i>carinatum</i>	Keel-billed Motmot			
<i>Ceryle</i>	<i>torquata</i>	Ringed Kingfisher			
<i>Ceryle</i>	<i>alcyon</i>	Belted Kingfisher			
<i>Chloroceryle</i>	<i>amazona</i>	Amazon Kingfisher	x		
<i>Chloroceryle</i>	<i>americana</i>	Green Kingfisher			
<i>Chloroceryle</i>	<i>aenea</i>	American Pygmy Kingfisher	x		
<i>Notharchus</i>	<i>macrorhynchus</i>	White-necked Puffbird			
<i>Malacoptila</i>	<i>panamensis</i>	White-whiskered Puffbird		x	
<i>Galbula</i>	<i>ruficauda</i>	Rufous-tailed Jacamar	x	x	
<i>Aulacorhynchus</i>	<i>prasinus</i>	Emerald Toucanet			
<i>Pteroglossus</i>	<i>torquatus</i>	Collared Aracari		x	
<i>Ramphastos</i>	<i>sulfuratus</i>	Keel-billed Toucan		x	
<i>Melanerpes</i>	<i>pucherani</i>	Black-cheeked Woodpecker		x	
<i>Melanerpes</i>	<i>aurifrons</i>	Golden-fronted Woodpecker			
<i>Picoides</i>	<i>scalaris</i>	Ladder-backed Woodpecker			
<i>Veniliornis</i>	<i>fumigatus</i>	Smoky-brown Woodpecker		x	
<i>Piculus</i>	<i>rubiginosus</i>	Golden-olive Woodpecker			
<i>Celeus</i>	<i>castaneus</i>	Chestnut-colored Woodpecker			
<i>Dryocopus</i>	<i>lineatus</i>	Lineated Woodpecker			
<i>Campephilus</i>	<i>guatemalensis</i>	Pale-billed Woodpecker		x	
<i>Synallaxis</i>	<i>erythrothorax</i>	Rufous-breasted Spinetail			
<i>Automolus</i>	<i>ochrolaemus</i>	Buff-throated Foliage-gleaner	x		
<i>Xenops</i>	<i>minutus</i>	Plain Xenops			
<i>Sclerurus</i>	<i>guatemalensis</i>	Scaly-throated Leaf-tosser			
<i>Dendrocincla</i>	<i>anabatina</i>	Tawny-winged Woodcreeper	x	x	
<i>Dendrocincla</i>	<i>homochroa</i>	Ruddy Woodcreeper	x	x	
<i>Sittasomus</i>	<i>griseicapillus</i>	Olivaceous Woodcreeper			
<i>Glyphorhynchus</i>	<i>spirurus</i>	Wedge-billed Woodcreeper	x	x	
<i>Dendrocolaptes</i>	<i>sanctithomae</i>	Northern Barred-Woodcreeper	x	x	
<i>Xiphorhynchus</i>	<i>flavigaster</i>	Ivory-billed Woodcreeper	x	x	
<i>Lepidocolaptes</i>	<i>souleyetii</i>	Streak-headed Woodcreeper	x		
<i>Taraba</i>	<i>major</i>	Great Antshrike			
<i>Thamnophilus</i>	<i>doliatus</i>	Barred Antshrike			
<i>Dysithamnus</i>	<i>mentalis</i>	Plain Antwren			
<i>Microrhophias</i>	<i>quixensis</i>	Dot-winged Antwren		x	
<i>Cercomacra</i>	<i>tyrannina</i>	Dusky Antbird	x		
<i>Formicarius</i>	<i>analisis</i>	Black-faced Antthrush	x	x	
<i>Ornithion</i>	<i>semiflavum</i>	Yellow-bellied Tyrannulet			
<i>Camptostoma</i>	<i>imberbe</i>	Northern Beardless-Tyrannulet		x	
<i>Myiopagis</i>	<i>viridicata</i>	Greenish Elaenia		x	
<i>Elaenia</i>	<i>flavogaster</i>	Yellow-bellied Elaenia			

<i>Mionectes</i>	<i>oleagineus</i>	Ochre-bellied Flycatcher	x	x	
<i>Leptopogon</i>	<i>amaurocephalus</i>	Sepia-capped Flycatcher	x	x	
<i>Zimmerius</i>	<i>vilissimus</i>	Paltry Tyrannulet			
<i>Oncostoma</i>	<i>cinereigulare</i>	Northern Bentbill	x	x	
<i>Poecilotriccus</i>	<i>sylvia</i>	Slate-headed Tody-Flycatcher			
<i>Todirostrum</i>	<i>cinereum</i>	Common Tody-Flycatcher	x		
<i>Rhynchocyclus</i>	<i>brevirostris</i>	Eye-ringed Flatbill		x	
<i>Tolmomyias</i>	<i>sulphurescens</i>	Yellow-olive Flycatcher	x	x	
<i>Platyrinchus</i>	<i>cancrominus</i>	Stub-tailed Spadebill	x		
<i>Onychorhynchus</i>	<i>coronatus</i>	Royal Flycatcher	x	x	
<i>Terenotriccus</i>	<i>erythrus</i>	Ruddy-tailed Flycatcher	x	x	
<i>Myiobius</i>	<i>sulphureipygius</i>	Sulphur-rumped Flycatcher	x	x	
<i>Contopus</i>	<i>virens</i>	Eastern Wood-Pewee		x	
<i>Contopus</i>	<i>cinereus</i>	Tropical Pewee			
<i>Empidonax</i>	<i>flaviventris</i>	Yellow-bellied Flycatcher	x	x	
<i>Empidonax</i>	<i>minimus</i>	Least Flycatcher		x	
<i>Sayornis</i>	<i>nigricans</i>	Black Phoebe			
<i>Attila</i>	<i>spadiceus</i>	Bright-rumped Attila	x		
<i>Rhytipterna</i>	<i>holerythra</i>	Rufous Mourner		x	
<i>Myiarchus</i>	<i>tuberculifer</i>	Dusky-capped Flycatcher	x	x	
<i>Myiarchus</i>	<i>crinitus</i>	Great Crested Flycatcher		x	
<i>Myiarchus</i>	<i>tyrannulus</i>	Brown-crested Flycatcher			
<i>Pitangus</i>	<i>sulphuratus</i>	Great Kiskadee			
<i>Megarynchus</i>	<i>pitangua</i>	Boat-billed Flycatcher		x	
<i>Myiozetetes</i>	<i>similis</i>	Social Flycatcher	x		
<i>Myiodynastes</i>	<i>maculatus</i>	Streaked Flycatcher			
<i>Myiodynastes</i>	<i>luteiventris</i>	Sulphur-bellied Flycatcher			
<i>Legatus</i>	<i>leucophaeus</i>	Piratic Flycatcher			
<i>Tyrannus</i>	<i>melancholicus</i>	Tropical Kingbird			
<i>Tyrannus</i>	<i>couchii</i>	Couch's Kingbird			
<i>Tyrannus</i>	<i>tyrannus</i>	Eastern Kingbird			
<i>Schiffornis</i>	<i>turdinus</i>	Thrush-like Schiffornis	x	x	
<i>Lipaugus</i>	<i>unirufus</i>	Rufous Piha		x	
<i>Pachyramphus</i>	<i>cinnamomeus</i>	Cinnamon Becard			
<i>Pachyramphus</i>	<i>polychopterus</i>	White-winged Becard			
<i>Pachyramphus</i>	<i>major</i>	Gray-collared Becard			
<i>Pachyramphus</i>	<i>aglaiae</i>	Rose-throated Becard		x	
<i>Tityra</i>	<i>semifasciata</i>	Masked Tityra	x		
<i>Tityra</i>	<i>inquisitor</i>	Black-crowned Tityra		x	
<i>Manacus</i>	<i>candei</i>	White-collared Manakin	x	x	
<i>Pipra</i>	<i>mentalis</i>	Red-capped Manakin	x		
<i>Vireo</i>	<i>griseus</i>	White-eyed Vireo			
<i>Vireo</i>	<i>pallens</i>	Mangrove Vireo			
<i>Vireo</i>	<i>flavifrons</i>	Yellow-throated Vireo			
<i>Vireo</i>	<i>olivaceus</i>	Red-eyed Vireo			
<i>Vireo</i>	<i>flavoviridis</i>	Yellow-green Vireo	x		
<i>Hylophilus</i>	<i>ochraceiceps</i>	Tawny-crowned Greenlet	x	x	
<i>Hylophilus</i>	<i>decurtatus</i>	Lesser Greenlet		x	

<i>Vireolanius</i>	<i>pulchellus</i>	Green Shrike-Vireo		x	
<i>Cyanocorax</i>	<i>morio</i>	Brown Jay		x	
<i>Progne</i>	<i>chalybea</i>	Gray-breasted Martin			
<i>Tachycineta</i>	<i>albilinea</i>	Mangrove Swallow			
<i>Thryothorus</i>	<i>maculipectus</i>	Spot-breasted Wren	x	x	
<i>Troglodytes</i>	<i>aedon</i>	House Wren	x		
<i>Henicorhina</i>	<i>leucosticta</i>	White-breasted Wood-Wren	x	x	
<i>Microcerculus</i>	<i>philomela</i>	Nightingale Wren			
<i>Ramphocaenus</i>	<i>melanurus</i>	Long-billed Gnatwren		x	
<i>Polioptila</i>	<i>caerulea</i>	Blue-gray Gnatcatcher			
<i>Polioptila</i>	<i>plumbea</i>	Tropical Gnatcatcher		x	
<i>Catharus</i>	<i>minimus</i>	Gray-cheeked Thrush			
<i>Catharus</i>	<i>ustulatus</i>	Swainson's Thrush	x		
<i>Hylocichla</i>	<i>mustelina</i>	Wood Thrush	x	x	
<i>Turdus</i>	<i>grayi</i>	Clay-colored Robin	x		
<i>Dumetella</i>	<i>carolinensis</i>	Gray Catbird	x	x	
<i>Mimus</i>	<i>gilvus</i>	Tropical Mockingbird			
<i>Dendroica</i>	<i>petechia</i>	Yellow Warbler			
<i>Dendroica</i>	<i>pensylvanica</i>	Chestnut-sided Warbler	x	x	
<i>Dendroica</i>	<i>magnolia</i>	Magnolia Warbler	x	x	
<i>Dendroica</i>	<i>caerulescens</i>	Black-throated Blue Warbler			
<i>Dendroica</i>	<i>coronata</i>	Yellow-rumped Warbler	x		
<i>Dendroica</i>	<i>virens</i>	Black-throated Green Warbler		x	
<i>Dendroica</i>	<i>dominica</i>	Yellow-throated Warbler			
<i>Mniotilta</i>	<i>varia</i>	Black-and-white Warbler		x	
<i>Setophaga</i>	<i>ruticilla</i>	American Redstart	x		
<i>Protonotaria</i>	<i>citrea</i>	Prothonotary Warbler			
<i>Helmitheros</i>	<i>vermivorus</i>	Worm-eating Warbler	x	x	
<i>Limnothlypis</i>	<i>swainsonii</i>	Swainson's Warbler			
<i>Seiurus</i>	<i>aurocapillus</i>	Ovenbird	x		
<i>Seiurus</i>	<i>noveboracensis</i>	Northern Waterthrush	x		
<i>Seiurus</i>	<i>motacilla</i>	Louisiana Waterthrush	x	x	
<i>Oporornis</i>	<i>formosus</i>	Kentucky Warbler	x	x	
<i>Oporornis</i>	<i>philadelphia</i>	Mourning Warbler			
<i>Geothlypis</i>	<i>trichas</i>	Common Yellowthroat	x		
<i>Wilsonia</i>	<i>citrina</i>	Hooded Warbler	x	x	
<i>Wilsonia</i>	<i>pusilla</i>	Wilson's Warbler			
<i>Icteria</i>	<i>virens</i>	Yellow-breasted Chat	x		
<i>Eucometis</i>	<i>penicillata</i>	Gray-headed Tanager	x		
<i>Lanio</i>	<i>aurantius</i>	Black-throated Shrike-Tanager			
<i>Habia</i>	<i>rubica</i>	Red-crowned Ant-Tanager	x	x	
<i>Habia</i>	<i>fuscicauda</i>	Red-throated Ant-Tanager	x	x	
<i>Piranga</i>	<i>roseogularis</i>	Rose-throated Tanager			
<i>Piranga</i>	<i>flava</i>	Hepatic Tanager			
<i>Piranga</i>	<i>rubra</i>	Summer Tanager	x	x	
<i>Piranga</i>	<i>olivacea</i>	Scarlet Tanager			
<i>Ramphocelus</i>	<i>sanguinolentus</i>	Crimson-collared Tanager			
<i>Ramphocelus</i>	<i>passerini</i>	Passerini's Tanager			

<i>Thraupis</i>	<i>episcopus</i>	Blue-gray Tanager			
<i>Thraupis</i>	<i>abbas</i>	Yellow-winged Tanager			
<i>Euphonia</i>	<i>affinis</i>	Scrub Euphonia		x	
<i>Euphonia</i>	<i>hirundinacea</i>	Yellow-throated Euphonia	x	x	
<i>Euphonia</i>	<i>gouldi</i>	Olive-backed Euphonia		x	
<i>Tangara</i>	<i>larvata</i>	Golden-hooded Tanager			
<i>Chlorophanes</i>	<i>spiza</i>	Green Honeycreeper			
<i>Cyanerpes</i>	<i>cyaneus</i>	Red-legged Honeycreeper		x	
<i>Sporophila</i>	<i>americana</i>	Variable Seedeater	x		
<i>Sporophila</i>	<i>torqueola</i>	White-collared Seedeater	x		
<i>Oryzoborus</i>	<i>funereus</i>	Thick-billed Seed-Finch	x		
<i>Arremon</i>	<i>aurantiirrostris</i>	Orange-billed Sparrow	x		
<i>Arremonops</i>	<i>chloronotus</i>	Green-backed Sparrow	x		
<i>Saltator</i>	<i>coerulescens</i>	Grayish Saltator			
<i>Saltator</i>	<i>maximus</i>	Buff-throated Saltator	x		
<i>Saltator</i>	<i>atriceps</i>	Black-headed Saltator			
<i>Caryothraustes</i>	<i>poliogaster</i>	Black-faced Grosbeak			
<i>Pheucticus</i>	<i>ludovicianus</i>	Rose-breasted Grosbeak			
<i>Cyanocompsa</i>	<i>cyanooides</i>	Blue-black Grosbeak	x	x	
<i>Cyanocompsa</i>	<i>parellina</i>	Blue Bunting			
<i>Passerina</i>	<i>caerulea</i>	Blue Grosbeak	x		
<i>Passerina</i>	<i>cyanea</i>	Indigo Bunting	x	x	
<i>Passerina</i>	<i>ciris</i>	Painted Bunting	x		x
<i>Dives</i>	<i>dives</i>	Melodious Blackbird	x		
<i>Quiscalus</i>	<i>mexicanus</i>	Great-tailed Grackle			
<i>Molothrus</i>	<i>oryzivorus</i>	Giant Cowbird			
<i>Icterus</i>	<i>prothemelas</i>	Black-cowled Oriole		x	
<i>Icterus</i>	<i>spurius</i>	Orchard Oriole			
<i>Icterus</i>	<i>mesomelas</i>	Yellow-tailed Oriole			
<i>Icterus</i>	<i>graduacauda</i>	Audubon's Oriole			
<i>Icterus</i>	<i>galbula</i>	Baltimore Oriole			
<i>Amblycercus</i>	<i>holosericeus</i>	Yellow-billed Cacique			
<i>Psarocolius</i>	<i>wagleri</i>	Chestnut-headed Oropendola			
<i>Psarocolius</i>	<i>montezuma</i>	Montezuma Oropendola		x	

Table 2. Alphabetical list of species detected by banding and/or point count surveys, including IUCN species.

Common Name	Genus	species	Banding	Point Count	IUCN
Amazon Kingfisher	<i>Chloroceryle</i>	<i>amazona</i>	x		
American Pygmy Kingfisher	<i>Chloroceryle</i>	<i>aenea</i>	x		
American Redstart	<i>Setophaga</i>	<i>ruticilla</i>	x		
Band-tailed Barbthroat	<i>Threnetes</i>	<i>ruckeri</i>	x		
Black-and-white Warbler	<i>Mniotilta</i>	<i>varia</i>		x	
Black-cheeked Woodpecker	<i>Melanerpes</i>	<i>pucherani</i>		x	
Black-cowled Oriole	<i>Icterus</i>	<i>prosthemelas</i>		x	
Black-crowned Tityra	<i>Tityra</i>	<i>inquisitor</i>		x	
Black-faced Antthrush	<i>Formicarius</i>	<i>analisis</i>	x	x	
Black-throated Green Warbler	<i>Dendroica</i>	<i>virens</i>		x	
Blue Grosbeak	<i>Passerina</i>	<i>caerulea</i>	x		
Blue-black Grosbeak	<i>Cyanocompsa</i>	<i>cyanooides</i>	x	x	
Blue-crowned Motmot	<i>Momotus</i>	<i>momota</i>	x	x	
Boat-billed Flycatcher	<i>Megarynchus</i>	<i>pitangua</i>		x	
Bright-rumped Attila	<i>Attila</i>	<i>spadiceus</i>	x		
Brown-hooded Parrot	<i>Pionopsitta</i>	<i>haematotis</i>		x	
Brown Jay	<i>Cyanocorax</i>	<i>morio</i>		x	
Buff-throated Foliage-gleaner	<i>Automolus</i>	<i>ochrolaemus</i>	x		
Buff-throated Saltator	<i>Saltator</i>	<i>maximus</i>	x		
Chestnut-sided Warbler	<i>Dendroica</i>	<i>pennsylvanica</i>	x	x	
Clay-colored Robin	<i>Turdus</i>	<i>grayi</i>	x		
Collared Aracari	<i>Pteroglossus</i>	<i>torquatus</i>		x	
Common Tody-Flycatcher	<i>Todirostrum</i>	<i>cinereum</i>	x		
Common Yellowthroat	<i>Geothlypis</i>	<i>trichas</i>	x		
Dot-winged Antwren	<i>Microrhopias</i>	<i>quixensis</i>		x	
Dusky Antbird	<i>Cercomacra</i>	<i>tyrannina</i>	x		
Dusky-capped Flycatcher	<i>Myiarchus</i>	<i>tuberculifer</i>	x	x	
Eastern Wood-Pewee	<i>Contopus</i>	<i>virens</i>		x	
Eye-ringed Flatbill	<i>Rhynchocyclus</i>	<i>brevirostris</i>		x	
Gray Catbird	<i>Dumetella</i>	<i>carolinensis</i>	x	x	
Gray-chested Dove	<i>Leptotila</i>	<i>cassini</i>	x		
Gray-fronted Dove	<i>Leptotila</i>	<i>rufaxilla</i>	x		
Gray-headed Tanager	<i>Eucometis</i>	<i>penicillata</i>	x		
Great Curassow	<i>Crax</i>	<i>rubra</i>		x	x
Great Tinamou	<i>Tinamus</i>	<i>major</i>		x	
Great Crested Flycatcher	<i>Myiarchus</i>	<i>crinitus</i>		x	
Green Shrike-Vireo	<i>Vireolanius</i>	<i>pulchellus</i>		x	
Green-backed Sparrow	<i>Arremonops</i>	<i>chloronotus</i>	x		
Greenish Elaenia	<i>Myiopagis</i>	<i>viridicata</i>		x	
Hooded Warbler	<i>Wilsonia</i>	<i>citrina</i>	x	x	
House Wren	<i>Troglodytes</i>	<i>aedon</i>	x		
Indigo Bunting	<i>Passerina</i>	<i>cyanea</i>	x	x	
Ivory-billed Woodcreeper	<i>Xiphorhynchus</i>	<i>flavigaster</i>	x	x	
Keel-billed Toucan	<i>Ramphastos</i>	<i>sulfuratus</i>		x	
Kentucky Warbler	<i>Oporornis</i>	<i>formosus</i>	x	x	

Laughing Falcon	<i>Herpetotheres</i>	<i>cachinnans</i>		x	
Least Flycatcher	<i>Empidonax</i>	<i>minimus</i>		x	
Lesser Greenlet	<i>Hylophilus</i>	<i>decurtatus</i>		x	
Little Tinamou	<i>Crypturellus</i>	<i>soui</i>		x	
Long-billed Gnatwren	<i>Ramphocaenus</i>	<i>melanurus</i>		x	
Long-billed Hermit	<i>Phaethornis</i>	<i>longirostris</i>	x	x	
Louisiana Waterthrush	<i>Seiurus</i>	<i>motacilla</i>	x	x	
Magnolia Warbler	<i>Dendroica</i>	<i>magnolia</i>	x	x	
Masked Tityra	<i>Tityra</i>	<i>semifasciata</i>	x		
Mealy Parrot	<i>Amazona</i>	<i>farinosa</i>		x	
Melodious Blackbird	<i>Dives</i>	<i>dives</i>	x		
Montezuma Oropendola	<i>Psarocolius</i>	<i>montezuma</i>		x	
Northern Barred-Woodcreeper	<i>Dendrocolaptes</i>	<i>sanctithomae</i>	x	x	
Northern Beardless-Tyrannulet	<i>Camptostoma</i>	<i>imberbe</i>		x	
Northern Bentbill	<i>Oncostoma</i>	<i>cinereigulare</i>	x	x	
Northern Waterthrush	<i>Seiurus</i>	<i>noveboracensis</i>	x		
Ochre-bellied Flycatcher	<i>Mionectes</i>	<i>oleagineus</i>	x	x	
Olive-backed Euphonia	<i>Euphonia</i>	<i>gouldi</i>		x	
Orange-billed Sparrow	<i>Arremon</i>	<i>aurantiirrostris</i>	x		
Ovenbird	<i>Seiurus</i>	<i>aurocapilla</i>	x		
Painted Bunting	<i>Passerina</i>	<i>ciris</i>	x		x
Pale-billed Woodpecker	<i>Campephilus</i>	<i>guatemalensis</i>		x	
Purple-crowned Fairy	<i>Heliophryx</i>	<i>barroti</i>		x	
Red-capped Manakin	<i>Pipra</i>	<i>mentalis</i>	x		
Red-crowned Ant-Tanager	<i>Habia</i>	<i>rubica</i>	x	x	
Red-legged Honeycreeper	<i>Cyanerpes</i>	<i>cyaneus</i>		x	
Red-throated Ant-Tanager	<i>Habia</i>	<i>fuscicauda</i>	x	x	
Roadside Hawk	<i>Buteo</i>	<i>magnirostris</i>	x		
Rose-throated Becard	<i>Pachyramphus</i>	<i>aglaiae</i>		x	
Royal Flycatcher	<i>Onychorhynchus</i>	<i>coronatus</i>	x	x	
Ruddy Quail-Dove	<i>Geotrygon</i>	<i>montana</i>	x		
Ruddy Woodcreeper	<i>Dendrocincla</i>	<i>homochroa</i>	x	x	
Ruddy-tailed Flycatcher	<i>Terentriacus</i>	<i>erythrurus</i>	x	x	
Rufous Mourner	<i>Rhytipterna</i>	<i>holerythra</i>		x	
Rufous Piha	<i>Lipaugus</i>	<i>unirufus</i>		x	
Rufous-tailed Hummingbird	<i>Amazilia</i>	<i>tzacatl</i>	x	x	
Rufous-tailed Jacamar	<i>Galbula</i>	<i>ruficauda</i>	x	x	
Scrub Euphonia	<i>Euphonia</i>	<i>affinis</i>		x	
Sepia-capped Flycatcher	<i>Leptopogon</i>	<i>amaurocephalus</i>	x	x	
Short-billed Pigeon	<i>Patagioenas</i>	<i>nigrirostris</i>		x	
Short-tailed Hawk	<i>Buteo</i>	<i>brachyurus</i>		x	
Slaty-tailed Trogon	<i>Trogon</i>	<i>massena</i>		x	
Smoky-brown Woodpecker	<i>Veniliornis</i>	<i>fumigatus</i>		x	
Social Flycatcher	<i>Myiozetetes</i>	<i>similis</i>	x		
Spot-breasted Wren	<i>Thryothorus</i>	<i>maculipectus</i>	x	x	
Squirrel Cuckoo	<i>Piaya</i>	<i>cayana</i>		x	
Streak-headed Woodcreeper	<i>Lepidocolaptes</i>	<i>souleyetii</i>	x		
Stripe-throated Hermit	<i>Phaethornis</i>	<i>striigularis</i>	x	x	

Stub-tailed Spadebill	<i>Platyrinchus</i>	<i>cancrominus</i>	x		
Sulphur-rumped Flycatcher	<i>Myiobius</i>	<i>sulphureipygius</i>	x	x	
Summer Tanager	<i>Piranga</i>	<i>rubra</i>	x	x	
Swainson's Thrush	<i>Catharus</i>	<i>ustulatus</i>	x		
Tawny-crowned Greenlet	<i>Hylophilus</i>	<i>ochraceiceps</i>	x	x	
Tawny-winged Woodcreeper	<i>Dendrocincla</i>	<i>anabatina</i>	x	x	
Thick-billed Seed-Finch	<i>Oryzoborus</i>	<i>funereus</i>	x		
Thrush-like Schiffornis	<i>Schiffornis</i>	<i>turdina</i>	x	x	
Tropical Gnatcatcher	<i>Polioptila</i>	<i>plumbea</i>		x	
Variable Seedeater	<i>Sporophila</i>	<i>americana</i>	x		
Violaceous Trogon	<i>Trogon</i>	<i>violaceus</i>		x	
Violet-crowned Woodnymph	<i>Thalurania</i>	<i>colombica</i>	x		
Wedge-billed Woodcreeper	<i>Glyphorhynchus</i>	<i>spirurus</i>	x	x	
Wedge-tailed Sabrewing	<i>Campylopterus</i>	<i>curvipennis</i>	x	x	
White-bellied Emerald	<i>Amazilia</i>	<i>candida</i>	x	x	
White-breasted Wood-Wren	<i>Henicorhina</i>	<i>leucosticta</i>	x	x	
White-collared Manakin	<i>Manacus</i>	<i>candei</i>	x	x	
White-collared Seedeater	<i>Sporophila</i>	<i>torqueola</i>	x		
White-crowned Parrot	<i>Pionus</i>	<i>senilis</i>		x	
White-fronted Parrot	<i>Amazona</i>	<i>albifrons</i>		x	
White-whiskered Puffbird	<i>Malacoptila</i>	<i>panamensis</i>		x	
Wood Thrush	<i>Hylocichla</i>	<i>mustelina</i>	x	x	
Worm-eating Warbler	<i>Helmitheros</i>	<i>vermivorum</i>	x	x	
Yellow-bellied Flycatcher	<i>Empidonax</i>	<i>flaviventris</i>	x	x	
Yellow-breasted Chat	<i>Icteria</i>	<i>virens</i>	x		
Yellow-faced Grassquit	<i>Tiaris</i>	<i>olivaceus</i>	x		
Yellow-green Vireo	<i>Vireo</i>	<i>flavoviridis</i>	x		
Yellow-olive Flycatcher	<i>Tolmomyias</i>	<i>sulphurescens</i>	x	x	
Yellow-rumped Warbler	<i>Dendroica</i>	<i>coronata</i>	x		
Yellow-throated Euphonia	<i>Euphonia</i>	<i>hirundinacea</i>	x	x	