



**AVIAN INVENTORY AND MONITORING
 REPORT
 OSA CONSERVATION PROPERTIES
 CERRO OSA
 PIRO
 NEENAH PAPER
 OSA PENINSULA, COSTA RICA**

PREPARED BY: KAREN M. LEAVELLE
 FOR: OSA CONSERVATION
 APRIL 2013

TABLE OF CONTENTS

INTRODUCTION	2
METHODS	3
Study Site	3
Bird Surveys	5
RESULTS	
Community Composition and Density	6
Neotropical Migratory and Indicator Species	6
Habitat and Elevation Associations	
Neenah Paper	12
LITERATURE CITED	14
Table 1: Osa Priority Species	3
Table 2: Species Richness	6
Table 3: Cumulative list of resident bird species	7
Table 4: Cumulative list of Neotropical migratory birds	10
Table 5: BCAT by elevation	11
Table 6: BCAT by forest type	12
Table 7: Neenah Paper species richness	12
Appendix A: Bird species densities Osa Conservation	15
Appendix B: Bird species densities Neenah Paper	16
Appendix C: Threatened or endemic species	17
Appendix D: Comprehensive list of all OC bird species	18
Appendix E: Comprehensive list of all Osa Peninsula species	24

RECOMMENDED CITATION

Leavelle, K.M. 2013. Avian Inventory and Monitoring Report for Osa Conservation Properties at Cerro Osa and Piro Research Stations, Osa Peninsula, Costa Rica. Technical Report for Osa Conservation. p 36. Washington, DC.

INTRODUCTION

The Osa Peninsula of Costa Rica is home to over 460 tropical year round resident and overwintering neotropical migratory bird species blanketing one of the most biologically diverse corners of the planet. The Osa harbors eight regional endemic species, five of which are considered to be globally threatened or endangered (Appendix C), and over 100 North American Nearctic or passage migrants found within all 13 ecosystems that characterize the peninsula. Currently there are five Nearctic migratory bird species of global conservation concern (Table 1). Because the Osa Peninsula accounts for less than 8% of Costa Rican territory yet holds ½ of its biodiversity makes the Osa extremely important for its large and diverse avian community. Osa Conservation properties account for nearly 5,000 acres and play an important role in the biological connectedness between Matapalo and Corcovado National Park, and maintain a vital link as well between Piedras Blancas National Park and the Sierpe National Wetlands to the north. This report provides results from two years of monitoring of bird populations on all Osa Conservation properties with the documentation of monitoring abundance, community composition in varying habitat types and long-term health of bird species as the primary goal.

The following avian monitoring point count protocol was established by the U. S. Fish and Wildlife Service and has been adapted for use by Osa Conservation. Osa Conservation works in partnership with the Wisconsin Department of Natural Resources and the Southern Wings Program, The Wisconsin Natural Resources Foundation (NRF), the American Bird Conservancy (ABC), and the South East region of Partners in Flight (PIF) for the purposes of avian research and conservation. Data is available for all resident and neotropical migratory species especially those species of local and global conservation concern. Osa Conservation data is available at Ebird and at www.osaconservation.org.

This report mainly serves to update the previous Avian Monitoring report prepared for Osa Conservation by Leavelle (2012). Study objectives and study site descriptions remain the same and are included here for easy reference. Please see Leavelle (2012) for details outlining methods including protocol and sampling design.

OBJECTIVES

The following are Osa Conservation avian monitoring objectives applied towards primary forest and varying degrees of secondary forest ecosystems located at Piro, Cerro Osa, Arbolito and Lomas de Sierpe properties. The Neenah Paper restoration plot located on the Cerro Osa property is also included here. (the NRDC restoration plot and Lomas de Sierpe are filed as separate reports).

- 1. Inventory:** Conduct an inventory of all landbird species found on Osa Conservation properties, estimating *species density* across elevational bands and forest type. The objective is to estimate the status of all landbird species in the target habitat which are primary forest and varying degrees of secondary successional rainforest growth.
- 2. Habitat and elevation associations** Estimate species density where possible by habitat type and by elevational band. This process is in its beginning stages as several years of data will be necessary to derive density estimates with some certainty.

PRIORITY/INDICATOR SPECIES

A subset of landbird species have been defined *a priori* as both priority and indicator species that will serve as focal species for monitoring even when the entire landbird community is being surveyed (Table 1). This list of species will also serve as a functional list of species for all observers especially volunteers

that don't otherwise have avian identification skills and will allow them to participate in scheduled point count surveys and still pool together important information on specific priority or indicator species whose bird call are easily learned. These species may have one or more of these attributes:

1. Closely associated with major habitat types under management (habitat specialist or indicator species).
2. Classified as a species of conservation concern due to decreases in population size by the International Union for the Conservation of Nature (IUCN), BirdLife International, Partners in Flight (PIF), or USFWS Migratory Birds (Priority species).
3. Detected with sufficient frequency that the sampling objectives are likely to be attainable with available resources over an extended period of time.

Table 1: Osa priority resident & neotropical migratory species & (IUCN) conservation status 2012.

Species	Scientific Name	Breeding Status	Global Status
Great Curassow	<i>Crax rubra</i>	Resident	VU
Mangrove Hummingbird	<i>Amazilia boucardi</i>	Resident	EN
Baird's Trogon	<i>Trogon bairdii</i>	Resident	NT
Olive-sided Flycatcher*	<i>Contopus cooperi</i>	Migrant	NT
Turquoise Cotinga	<i>Cotinga ridgwayi</i>	Resident	VU
Yellow-billed Cotinga	<i>Carpodectes antoniae</i>	Resident	EN
Wood Thrush*	<i>Hylocichla mustelina</i>	Migrant	LC
Golden-winged Warbler*	<i>Vermivora chrysoptera</i>	Migrant	EN
Prothonotary Warbler*	<i>Protonotaria citrea</i>	Migrant	VU
Kentucky Warbler*	<i>Oporornis formosus</i>	Migrant	VU
Black-cheeked Ant-Tanager	<i>Habia atrimaxillaris</i>	Resident	EN

*All migrant species are listed as Partners in Flight (PIF) priority species for 2012.

METHODS

Study Site

Osa Conservation properties are located on the southern tip of the Osa Peninsula of Costa Rica (Fig 1). Osa Conservation properties are comprised of over 2,000 hectares of tropical rainforest and maintain pristine primary forest and varying degrees of secondary forest at several stages of regeneration and/or restoration. Piro property (8°24'13.01"N; 83°20'11.77"W) and the Piro Research Station are located ~5km west northwest of Cabo Matapalo covering an elevational band of 0 – 170 meters. Piro is bounded to the Cerro Osa property and to the north, and runs along the beach to the south for approximately 1.2km. The road between Puerto Jimenez and Carate runs in an east west direction through the property. The Cerro Osa Property (8°24'40.07"N; 83°19'14.29"W) and the Greg Gund Conservation Center continue the elevational climb from ~170 – 330 meters. The mountain rim and its highest elevational points run through the center of the property which has been known to receive considerably more rainfall during the winter season than its lower elevational neighbor Piro to the south. Cerro Arbolito (8°26'51.09"N; 83°21'38.56"W) is located just to the north of the Piro property; the two property borders nearly touching with only ~200 meters separating the two (Fig 1).

The Neenah Paper restoration plot (8°24'49.04"N; 83°18'58.75"W) is located just up the road from the Greg Gund Conservation Center (Fig. 2) and encompasses four different sections of old Pochote and Terminalia plantations all undergoing initial restoration efforts as of 2011. A lot of natural regeneration

is taking place in these areas slowly replacing the monocultures once planted. Restoration efforts are currently underway to assist in the process of forest restoration through Osa Conservations Land Stewardship Program. A variety of native tree seedlings are being planted and no plantation wood has been slated for harvest.

All properties are composed mainly of both primary forest (never cut) and differing degrees of secondary forest succession (having been cut at one time) from very early dense understory vegetation to later mature forest with sparse ground cover. Succession was classified as either early successional (0-10 years) or late successional (10 years plus). Early succession has greater understory vegetation at some times densely covered while late succession is typically characterized as having less understory vegetation and older fewer trees. At times a late successional forest could be mistaken for primary forest.

All three major Osa Conservation properties are located within the Osa Conservation Area (ACOSA), a vast majority of which falls within the Golfo Dulce Forest Reserve, and form more than 70% of the Osa Peninsula Wildlife Refuge. These protected areas form a large part of the biological corridor that runs between Cabo Matapalo and Corcovado National Park making its conservation value extremely important to all terrestrial animals due to its connectivity and contiguous forest cover and provides vital habitat for its hundreds of resident and migratory bird species year-round.

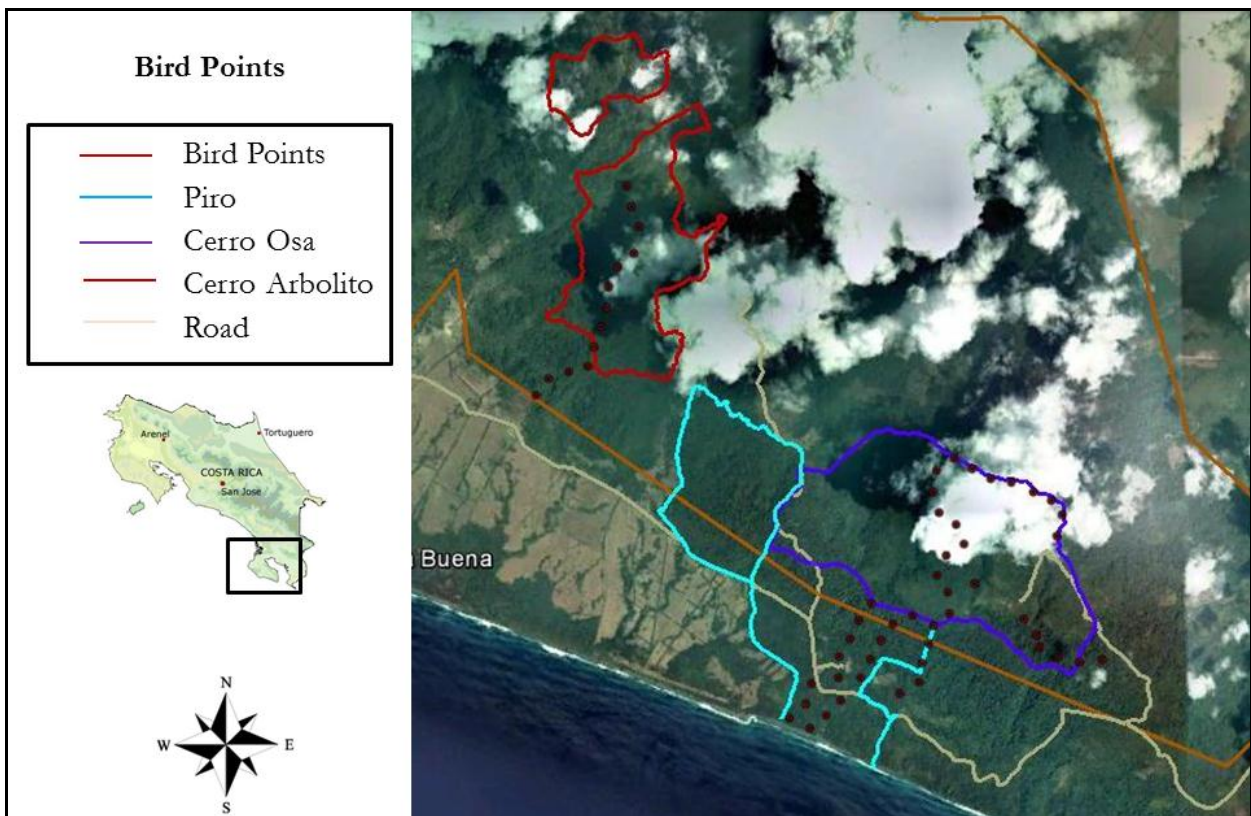


Fig. 1: Sample bird points at Piro, Cerro Osa and Cerro Arbolito properties 2010-2012, Osa Conservation, Osa Peninsula, Costa Rica.

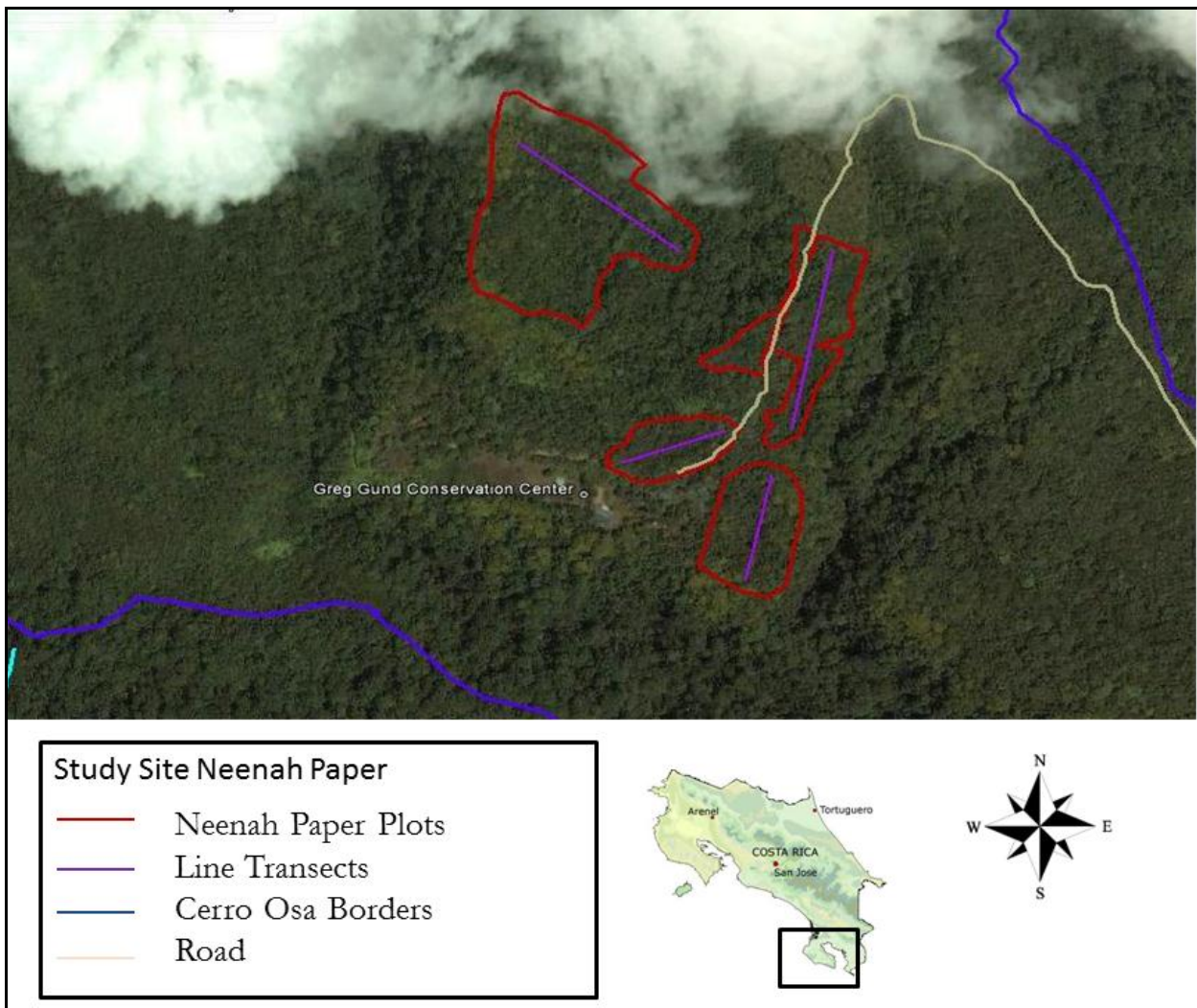


FIG. 2: Neenah Paper study plots 2010-1012 located at Cerro Osa and the Greg Gund Conservation Center, Osa Peninsula, Costa Rica.

BIRD SURVEYS

Point Counts

We sampled birds in September to November 2010, January to March 2012 and February 2013 using standard fixed radius point count methodology (Hutto et al. 1986) at point count stations (58 count stations from 2010-12 and 39 points in 2013) placed systematically throughout Piro, Cerro Osa and Arbolito Properties. (Fig. 1). The radial distance of a point was 100 m, and each point was separated by at least 250 m in order to avoid double counting individual birds (Verner 1988; Ralph et al. 1993). We estimated the radial distance from the observer to the bird from the center point out to 100 meters.

Neenah Paper

We sampled Neenah Paper restoration plots in March 2012 and February 2013 using line transects (2012 = 3 lines and 2013 = 2 lines) due to the narrow linear nature of the sample plots. The number of lines was reduced to 2 lines in 2013 as the House Teak Lot was cut for internet signal access in 2012. Transect counts should be resumed when the plot begins to mature (three to five years). Each Neenah Paper restoration plot is a different length (Plot S = 200 m, Terminalia = 500 m and House Teak Lot = 300 m) and analysed as such. We walked each Neenah Paper transect slowly (5 min/25 m) observing and

recording birds at and a maximum perpendicular distance of 25 meters from the center line on all transects.

Observers recorded all species seen or heard and the distance to each bird detected during 10-minute count periods at each station from 5:30am – 8:30am when birds are most active. We also recorded all birds seen or heard within the project area outside of the 10-minute count periods. These sightings are also included in our species list for the project area (Table 2). We recorded flyovers separately as birds may not be directly using the habitat (Ralph et al. 1993; Johnson in press). We did not conduct surveys during periods of heavy rain or strong wind because bird activity is suppressed and the observer's ability to detect birds is reduced under these conditions. Cicada outbreaks were high in 2013 causing surveys to be delayed and conducted during the earliest morning hours prior to cicada activity.

We used Distance estimation methods (Buckland *et al.* 1993, 2001) to define an area for estimates of relative abundance or density and to estimate the probability of detecting a bird species. We used program Distance 6.0 (Thomas et al. 2009) to estimate species density (birds/ha) for species with significant numbers of detections, and the probability of detecting a species (p) from the observer to the object of interest across all sample points. As per 2010 results, a total of 4 visits were conducted which meets with Tyre et al. (2003) recommendations allowing for an increase in species density estimation. Years were pooled as there was no difference in species densities between years.

RESULTS

Community Composition and Density

A total of 94 species (13 Neotropical migratory species and 81 resident species) representing 25 families were observed on Osa Conservation properties to include Piro and Cerro Osa from in February 2013. A cumulative total of 158 species (22 Neotropical migratory species and 136 resident species) representing 34 families (Tables 2-4) were observed over the three year study period. Estimates of density and detection are given for 46 species (4 Neotropical migratory species and 42 resident species) (Appendix A) where sufficient data allowed. The pooled data set from all years permitted data convergence on a greater number species with the inclusion of 2013 in the analysis.

Table 2: Species richness, number of bird species detected and family representation on Osa Conservation properties from 2010 -2013.

Year	# Species Detected	# Neotropical Migratory Bird Species	# Resident Bird Species	# Families
2010-2012	157	21	133	34
2013	94	13	81	25
Cumulative	158	22	136	34

Neotropical migratory species & all Indicator Species

No new neotropical migratory species were observed at point count stations in 2013. The number of observed indicator species either at point count stations or outside of the sample period is eight out of the 11 species on Osa Conservation properties over the three year study period. The Wood Thrush was observed at Lomas de Sierpe property in 2013 which is the first observation of this particular species for any of Osa Conservation properties between 2010 and 2013. The Kentucky Warbler and Prothonotary Warblers have not been observed at Cerro Osa or Piro since 2010, however, two Kentucky Warblers were observed at Lomas de Sierpe during line transect counts near the Rio Esquinas in 2013 (see full report). The Golden-winged Warbler has been observed once in 2010 and again in 2012 on the NRDC restoration plot and in the Neenah Paper restoration plot right outside of transect counts at the Greg Gund Conservation Center in all years. The Olive-sided Flycatcher was not seen during point counts or

outside of the sample period in 2013 however it was observed several times in 2010, 2011 and 2012. The Turquoise Cotinga was observed along the Northern Border in 2010 and at Lomas de Sierpe in 2013 during point and transect counts. Otherwise it has been observed outside of the sample period at the Piro Research Station and up near the cell tower at Cerro Osa feeding on Mistletoe berries.

Of all indicator species we only obtained sufficient observations for the Black-cheeked Ant-Tanager to estimate species density ($D = 2.896$, $SE = 0.393$). All other indicator species are generally rare and may appear in greater numbers in some years while not in others. Migratory birds with sufficient observation to obtain a density estimate were the Chestnut-sided Warbler ($D = 3.733$, $SE = 0.774$), the Tennessee Warbler ($D = 1.484$, $SE = 0.328$), the Summer Tanager ($D = 0.561$, $SE = 0.091$) and the Yellow-throated Vireo ($D = 0.323$, $SE = 0.067$) (Appendix A). Overall, observations for all species were down in 2013 resulting in a slight reduction in pooled density estimates over the three years. The migratory birds for which a density estimate has been obtained remains consistent in all years. The Chestnut-sided Warbler consistently remains the most abundant migrant found on Osa Conservation properties and across the peninsula.

The most abundant resident species continue to be the same 3 to 4 species as well; The Lesser Greenlet ($D = 3.3348$, $SE = 0.70218$), The Chestnut-backed Antbird ($D = 3.967$, $SE = 0.526$) followed by the Black-cheeked Ant-Tanager. Two novel species were added to the list of resident birds for 2013; The White Hawk was observed along the Ocelote trail and the Gray-headed Kite was seen on the Chicle Trail up at at the Cerro Osa Property.

Table 3: Cumulative list of resident bird species observed within Osa Conservation Properties Piro & Cerro Osa, Costa Rica from 2010 to 2013. The standardized common names of bird species are used (A.O.U. Check-list of North American Birds 2013).

Common Name	Family	Scientific Name
Great Tinamou	Tinamidae	Tinamus major
Little Tinamou	Tinamidae	Crypturellus soui
Great Curassow	Cracidae	Crax rubra
Gray-headed Chachalaca	Cracidae	Ortalis cinereiceps
Crested Guan	Cracidae	Penelope purpurascens
Marbled Wood-Quail	Odontophoridae	Odontophorus gujanensis
Black Vulture	Cathartidae	Coragyps atratus
Turkey Vulture	Cathartidae	Cathartes aura
King Vulture	Cathartidae	Sarcoramphus papa
Gray-headed Kite	Accipitridae	Leptodon cayanensis
Double-toothed Kite	Accipitridae	Harpagus bidentatus
Swallow-tailed Kite	Accipitridae	Elanoides forficatus
White Hawk	Accipitridae	Leucopternis albicollis
Roadside Hawk	Accipitridae	Buteo magnirostris
Black Hawk-Eagle	Accipitridae	Spizaetus tyrannus
Bat Falcon	Falconidae	Falco ruficularis
Laughing Falcon	Falconidae	Herpetotheres cachinnans
Collared Forest-Falcon	Falconidae	Micrastur semitorquatus
Gray-necked Wood-Rail	Rallidae	Aramides cajanea
Short-billed Pigeon	Columbidae	Patagioenas nigrirostris

Blue Ground-Dove	Columbidae	<i>Claravis pretiosa</i>
White-tipped Dove	Columbidae	<i>Leptotila verreauxi</i>
Gray-chested Dove	Columbidae	<i>Leptotila cassini</i>
Ruddy Quail-Dove	Columbidae	<i>Geotrygon montana</i>
Orange-chinned Parakeet	Psittacidae	<i>Brotogeris jugularis</i>
Brown-hooded Parrot	Psittacidae	<i>Pionopsitta haematotis</i>
White-crowned Parrot	Psittacidae	<i>Pionus senilis</i>
Scarlet Macaw	Psittacidae	<i>Ara macao</i>
Red-Lored Parrot	Psittacidae	<i>Amazona autumnalis</i>
Mealy Parrot	Psittacidae	<i>Amazona farinosa</i>
Mangrove Cuckoo	Cuculidae	<i>Coccyzus minor</i>
Striped Cuckoo	Cuculidae	<i>Tapera naevia</i>
Squirrel Cuckoo	Cuculidae	<i>Piaya cayana</i>
Black Swift	Apodidae	<i>Cypseloides niger</i>
White-collared Swift	Apodidae	<i>Streptoprocne zonaris</i>
Costa Rican Swift	Apodidae	<i>Chaetura fumosa</i>
Lesser Swallow-tailed Swift	Apodidae	<i>Panyptila cayennensis</i>
Stripe-throated Hermit	Trochilidae	<i>Phaethornis striigularis</i>
Long-billed Hermit	Trochilidae	<i>Phaethornis longirostris</i>
Bronzy Hermit	Trochilidae	<i>Glaucis aenea</i>
Band-tailed Barbthroat	Trochilidae	<i>Threnetes ruckeri</i>
White-tipped Sicklebill	Trochilidae	<i>Eutoxeres aquila</i>
Violet Sabrewing	Trochilidae	<i>Campylopterus hemileucurus</i>
Purple-crowned Fairy	Trochilidae	<i>Heliostyris barroti</i>
Charming Hummingbird	Trochilidae	<i>Amazilia decora</i>
White-necked Jacobin	Trochilidae	<i>Florisuga mellivora</i>
Violet-crowned Woodnymph	Trochilidae	<i>Thalurania colombica</i>
Blue-throated Goldentail	Trochilidae	<i>Hylocharis eliciae</i>
Rufous-tailed Hummingbird	Trochilidae	<i>Amazilia tzactl</i>
Gartered Trogon	Trogonidae	<i>Trogon caligatus</i>
Black-throated Trogon	Trogonidae	<i>Trogon rufus</i>
Baird's Trogon	Trogonidae	<i>Trogon bairdii</i>
Slaty-tailed Trogon	Trogonidae	<i>Trogon massena</i>
Blue-crowned Motmot	Momotidae	<i>Momotus momota</i>
White-necked Puffbird	Bucconidae	<i>Notharchus macrorhynchos</i>
Rufous-tailed Jacamar	Galbulidae	<i>Galbula ruficauda</i>
Black-mandibled Toucan	Ramphastidae	<i>Ramphastos ambiguus</i>
Golden-naped Woodpecker	Picidae	<i>Melanerpes chrysauchen</i>
Red-crowned Woodpecker	Picidae	<i>Melanerpes rubricapillus</i>
Rufous-winged Woodpecker	Picidae	<i>Piculus simplex</i>
Pale-billed Woodpecker	Picidae	<i>Campephilus guatemalensis</i>
Lineated Woodpecker	Picidae	<i>Dryocopus lineatus</i>
Buff-throated Foliage-gleaner	Furnariidae	<i>Automolus ochrolaemus</i>

Scaly-throated Leaf-tosser	Furnariidae	<i>Sclerurus guatemalensis</i>
Plain Xenops	Furnariidae	<i>Xenops minutus</i>
Northern Barred-Woodcreeper	Furnariidae	<i>Dendrocolaptes sanctithomae</i>
Tawny-winged Woodcreeper	Furnariidae	<i>Dendrocincla anabatina</i>
Wedge-billed Woodcreeper	Furnariidae	<i>Glyphorhynchus spirurus</i>
Cocoa Woodcreeper	Furnariidae	<i>Xiphorhynchus susurrans</i>
Black-striped Woodcreeper	Furnariidae	<i>Xiphorhynchus lachrymosus</i>
Great Antshrike	Thamnophilidae	<i>Taraba major</i>
Black-hooded Antshrike	Thamnophilidae	<i>Thamnophilus bridgesi</i>
Russet Antshrike	Thamnophilidae	<i>Thamnistes anabatinus</i>
Chestnut-backed Antbird	Thamnophilidae	<i>Myrmeciza exsul</i>
Bicolored Antbird	Thamnophilidae	<i>Gymnopithys leucaspis</i>
Plain Antvireo	Thamnophilidae	<i>Dysithamnus mentalis</i>
Dot-winged Antwren	Thamnophilidae	<i>Microrhopias quixensis</i>
Streak-chested Antpitta	Thamnophilidae	<i>Hylopezus perspicillatus</i>
Black-faced Antthrush	Thamnophilidae	<i>Formicarius analis</i>
Golden-crowned Spadebill	Tyrannidae	<i>Platyrrinchus coronatus</i>
Paltry Tyrannulet	Tyrannidae	<i>Zimmerius vilissimus</i>
Southern Beardless-Tyrannulet	Tyrannidae	<i>Camptostoma obsoletum</i>
Piratic Flycatcher	Tyrannidae	<i>Legatus leucophaeus</i>
Yellow-olive Flycatcher	Tyrannidae	<i>Tolmomyias sulphurescens</i>
Common Tody-Flycatcher	Tyrannidae	<i>Todirostrum cinereum</i>
Scale-crested Pygmy-Tyrant	Tyrannidae	<i>Lophotriccus pileatus</i>
Northern Bentbill	Tyrannidae	<i>Oncostoma cinereigulare</i>
Ochre-bellied Flycatcher	Tyrannidae	<i>Mionectes oleagineus</i>
Sulphur-rumped Flycatcher	Tyrannidae	<i>Myiobius sulphureipygius</i>
Bright-rumped Attila	Tyrannidae	<i>Attila spadiceus</i>
Rufous Mourner	Tyrannidae	<i>Rhytipterna holerythra</i>
Eye-ringed Flatbill	Tyrannidae	<i>Rhynchocyclus brevirostris</i>
Tropical Pewee	Tyrannidae	<i>Contopus cinereus</i>
Streaked Flycatcher	Tyrannidae	<i>Myiodynastes maculatus</i>
Thrushlike Schiffornis	Tityridae	<i>Schiffornis turdinus</i>
Rose-throated Becard	Tityridae	<i>Pachyramphus aglaiae</i>
White-winged Becard	Tityridae	<i>Pachyramphus polychopterus</i>
Masked Tityra	Tityridae	<i>Tityra semifasciata</i>
Black-crowned Tityra	Tityridae	<i>Tityra inquisitor</i>
Turquoise Cotinga	Cotingidae	<i>Cotinga ridgwayi</i>
Rufous Piha	Cotingidae	<i>Lipaugus unirufus</i>
Orange-collared Manakin	Pipridae	<i>Manacus aurantiacus</i>
Blue-crowned Manakin	Pipridae	<i>Pipra coronata</i>
Red-capped Manakin	Pipridae	<i>Pipra mentalis</i>
Yellow-green Vireo	Vireonidae	<i>Vireo flavoviridis</i>
Tawny-crowned Greenlet	Vireonidae	<i>Hylophilus ochraceiceps</i>

Lesser Greenlet	Vireonidae	<i>Hylophilus decurtatus</i>
Green Shrike-Vireo	Vireonidae	<i>Vireolanius pulchellus</i>
Long-billed Gnatwren	Sylviidae	<i>Ramphocaenus melanurus</i>
Tropical Gnatcatcher	Sylviidae	<i>Polioptila plumbea</i>
Riverside Wren	Troglodytidae	<i>Thryothorus semibadius</i>
Black-bellied Wren	Troglodytidae	<i>Thryothorus fasciatoventris</i>
Scaly-breasted Wren	Troglodytidae	<i>Microcerculus marginatus</i>
Buff-rumped Warbler	Parulidae	<i>Phaeothlypis fulvicauda</i>
Bananaquit	Parulidae	<i>Coereba flaveola</i>
Black-cheeked Ant-Tanager	Thraupidae	<i>Habia atrimaxillaris</i>
White-shouldered Tanager	Thraupidae	<i>Tachyphonus luctuosus</i>
White-lined Tanager	Thraupidae	<i>Tachyphonus rufus</i>
Gray-headed Tanager	Thraupidae	<i>Eucometis penicillata</i>
White-throated Shrike-Tanager	Thraupidae	<i>Lanio leucothorax</i>
Cherrie's Tanager	Thraupidae	<i>Ramphocelus costaricensis</i>
Golden-hooded Tanager	Thraupidae	<i>Tangara larvata</i>
Bay-headed Tanager	Thraupidae	<i>Tangara gyrola</i>
Green Honeycreeper	Thraupidae	<i>Chlorophanes spiza</i>
Shining Honeycreeper	Thraupidae	<i>Cyanerpes lucidus</i>
Red-legged Honeycreeper	Thraupidae	<i>Cyanerpes cyaneus</i>
Blue Dacnis	Thraupidae	<i>Dacnis cayana</i>
Orange-billed Sparrow	Emberizidae	<i>Arremon aurantiirostris</i>
Black-striped Sparrow	Emberizidae	<i>Arremonops conirostris</i>
Buff-throated Saltator	Cardinalidae	<i>Saltator maximus</i>
Rose-breasted Grosbeak	Cardinalidae	<i>Pheucticus ludovicianus</i>
Blue-black Grosbeak	Cardinalidae	<i>Cyanocompsa cyanoides</i>
Scarlet-rumped Caciue	Icteridae	<i>Cacicus uropygialis</i>
Yellow-crowned Euphonia	Fringillidae	<i>Euphonia luteicapilla</i>
White-vented Euphonia	Fringillidae	<i>Euphonia minuta</i>
Spot-crowned Euphonia	Fringillidae	<i>Euphonia imitans</i>

Table 4: Cumulative list of Neotropical Migratory bird species observed within Osa Conservation properties Piro & Cerro Osa, Costa Rica from 2010 to 2013. The standardized common names of bird species are used (A.O.U. Check-list of North American Birds 2013).

Common Name	Family	Scientific Name
Broad-winged Hawk	Accipitridae	<i>Buteo platypterus</i>
Olive-sided Flycatcher	Tyrannidae	<i>Contopus cooperi</i>
Eastern Wood-Pewee	Tyrannidae	<i>Contopus virens</i>
Yellow-bellied Flycatcher	Tyrannidae	<i>Empidonax flaviventris</i>
Great Crested Flycatcher	Tyrannidae	<i>Myiarchus crinitus</i>
Yellow-throated Vireo	Vireonidae	<i>Vireo flavifrons</i>
Philadelphia Vireo	Vireonidae	<i>Vireo philadelphicus</i>

Red-eyed Vireo	Vireonidae	Vireo olivaceus
Swainson's Thrush	Turdidae	Catharus ustulatus
Tennessee Warbler	Parulidae	Vermivora peregrina
Golden-winged Warbler	Parulidae	Vermivora chrysoptera
Yellow Warbler	Parulidae	Dendroica petechia
Chestnut-sided Warbler	Parulidae	Dendroica pensylvanica
Black-and-white Warbler	Parulidae	Mniotilta varia
American Redstart	Parulidae	Setophaga ruticilla
Ovenbird	Parulidae	Seiurus aurocapilla
Worm-eating Warbler	Parulidae	Helmitheros vermivorum
Mourning Warbler	Parulidae	Oporornis philadelphia
Kentucky Warbler	Parulidae	Oporornis formosus
Summer Tanager	Thraupidae	Piranga rubra
Baltimore Oriole	Icteridae	Icterus galbula

Habitat and Elevation Associations

Density estimates for elevation (Table 5) and habitat (Table 6) are given for the Black-cheeked Ant-Tanager. Observations are low for all other indicator species to conduct an analysis that include multiple covariates. The Black-cheeked Ant-Tanager continues to show an indication that there is an association with higher elevations with the highest density estimate at the 300-400 meters elevation band and primary forest indicating that they may prefer cooler habitats over warmer lower elevation microclimates or may be associated with a particular food source found higher up. Density is also higher in early successional forest than in late successional. Most early successional forest is located up at the higher elevation in and around the Greg Gund Conservation at Cerro Osa which strengthens the possibility that the link is with habitats higher up and the associated cooler climate.

Table 5: Black-cheeked Ant-Tanager densities (birds/hectare) (D), detection probability (p), standard error (SE) and 95% Confidence Intervals over stratified elevations at BCAT observed points on Osa Conservation properties, Osa Peninsula, Costa Rica from 2010 - 2013. Program Distance 6.0 was used for analysis.

Elevation	Parameter	Estimate	SE	95% LCI	95% UCI
300-400 meters	D	0.692	0.088	0.536	0.892
	p	0.107	0.014	0.083	0.138
200-300 meters	D	0.575	0.073	0.446	0.740
	p	0.127	0.016	0.099	0.164
100-200 meters	D	0.267	0.052	0.180	0.396
	p	0.119	0.023	0.080	0.177
0-100 meters	D	0.103	0.026	0.060	0.178
	p	0.167	0.043	0.097	0.290

Table 6: Black-cheeked Ant-Tanager densities (birds/hectare) (D), detection probability (p), standard error (SE) and 95% Confidence Intervals over stratified forest types at BCAT observed points on Osa Conservation properties, Osa Peninsula, Costa Rica from 2010-2013. Program Distance 6.0 was used for analysis.

Forest Type	Parameter	Estimate	SE	95% LCI	95% UCI
Primary	D	0.882	0.110	0.688	1.131
	p	0.098	0.012	0.076	0.125
Early Secondary	D	0.642	0.086	0.491	0.840
	p	0.107	0.014	0.082	0.141
Late Secondary	D	0.223	0.039	0.157	0.319
	p	0.184	0.032	0.129	0.263

Neenah Paper

A total 47 species (10 Neotropical migratory species and 37 resident species) representing 21 families were found on Neenah paper transects in 2013. A cumulative total of 59 species (11 Neotropical migratory species and 48 resident species) representing 24 families were found over the two study periods 2012 and 2013 (Tables 7 & 8). The species with the highest density found on the Neenah Paper restoration plots combined over the two years were the Riverside Wren (D = 3.258, SE = 1.395), Black-cheeked Ant-Tanager (D = 2.148, SE = 1.015), Northern Bentbill (D = 1.780, SE = 0.963) and the Lesser Greenlet (D = 1.719, SE = 0.354). The only Neotropical migratory species for which the density estimate was obtained was the Chestnut-sided Warbler (D = 0.344, SE = 0.123) (Appendix B). Additional years of data collection will reveal defined habitat associations to properly characterize the avian community in these restoration plots and changes over time

Table 7: Species richness, number of birds detected and family representation on the Neenah Paper restoration plot at the Cerro Osa property in 2012 & 2013.

Year	# Species Detected	# Neotropical Migratory Bird Species	# Resident Bird Species	# Families
2012	52	7	45	24
2013	47	10	37	21
Cumulative	59	11	48	24

Table 8: Cumulative list of resident & neotropical migratory bird species observed in 2012 & 2013 on Neenah Paper restoration plots at Cerro Osa within Osa Conservation property, Osa Peninsula, Costa Rica. The standardized common names of bird species are used. (A.O.U. Check-list of North American Birds 2011).

Common Name	Family	Scientific Name	2012	2013
Great Tinamou	Tinamidae	<i>Tinamus major</i>	*	*
Little Tinamou	Tinamidae	<i>Crypturellus soui</i>	*	*
Black Vulture	Cathartidae	<i>Coragyps atratus</i>	*	
Broad-winged Hawk*	Accipitridae	<i>Buteo platypterus</i>	*	*
Pale-vented Pigeon	Columbidae	<i>Patagioenas cayennensis</i>	*	*
Short-billed Pigeon	Columbidae	<i>Patagioenas nigrirostris</i>	*	*
Ruddy Ground-Dove	Columbidae	<i>Columbina talpacoti</i>	*	
Blue Ground-Dove	Columbidae	<i>Claravis pretiosa</i>	*	*

White-tipped Dove	Columbidae	<i>Leptotila verreauxi</i>	*	*
Gray-chested Dove	Columbidae	<i>Leptotila cassini</i>	*	*
White-crowned Parrot	Psittacidae	<i>Pionus senilis</i>	*	*
Scarlet Macaw	Psittacidae	<i>Ara macao</i>		*
Red-lored Parrot	Psittacidae	<i>Amazona autumnalis</i>	*	*
Mealy Parrot	Psittacidae	<i>Amazona farinosa</i>	*	*
Mangrove Cuckoo	Cuculidae	<i>Coccyzus minor</i>	*	
Charming Hummingbird	Trochilidae	<i>Amazilia decora</i>	*	*
Blue-throated Goldentail	Trochilidae	<i>Hylocharis eliciae</i>	*	*
White-necked Jacobin	Trochilidae	<i>Florisuga mellivora</i>	*	
Black-throated Trogon	Trogonidae	<i>Trogon rufus</i>		*
Gartered Trogon	Trogonidae	<i>Trogon Caligatus</i>	*	*
Slaty-tailed Trogon	Trogonidae	<i>Trogon massena</i>	*	*
Golden-naped Woodpecker	Picidae	<i>Melanerpes chrysauchen</i>	*	*
Red-crowned Woodpecker	Picidae	<i>Melanerpes rubricapillus</i>	*	*
Pale-billed Woodpecker	Picidae	<i>Campephilus guatemalensis</i>	*	*
Plain Xenops	Furnariidae	<i>Xenops minutus</i>	*	*
Wedge-billed Woodcreeper	Furnariidae	<i>Glyphorhynchus spirurus</i>	*	*
Cocoa Woodcreeper	Furnariidae	<i>Xiphorhynchus susurrans</i>	*	*
Black-striped Woodcreeper	Furnariidae	<i>Xiphorhynchus lachrymosus</i>	*	*
Black-hooded Antshrike	Thamnophilidae	<i>Thamnophilus bridgesi</i>	*	*
Chestnut-backed Antbird	Thamnophilidae	<i>Myrmeciza exsul</i>	*	*
Dot-winged Antwren	Thamnophilidae	<i>Microrhopias quixensis</i>	*	*
Golden-crowned Spadebill	Tyrannidae	<i>Platyrrinchus coronatus</i>	*	*
Paltry Tyrannulet	Tyrannidae	<i>Zimmerius vilissimus</i>	*	*
Piratic Flycatcher	Tyrannidae	<i>Legatus leucophaeus</i>	*	*
Yellow-olive Flycatcher	Tyrannidae	<i>Tolmomyias sulphurescens</i>	*	
Scale-crested Pygmy-Tyrant	Tyrannidae	<i>Lophotriccus pileatus</i>	*	
Northern Bentbill	Tyrannidae	<i>Oncostoma cinereigulare</i>	*	*
Ochre-bellied Flycatcher	Tyrannidae	<i>Mionectes oleagineus</i>	*	
Bright-rumped Attila	Tyrannidae	<i>Attila spadiceus</i>	*	*
Eye-ringed Flatbill	Tyrannidae	<i>Rhynchocyclus brevirostris</i>	*	
Eastern Wood-Pewee*	Tyrannidae	<i>Contopus virens</i>	*	*
Great Crested Flycatcher*	Tyrannidae	<i>Myiarchus crinitus</i>	*	*
Dusky-capped Flycatcher	Tyrannidae	<i>Myiarchus tuberculifer</i>	*	*
Masked Tityra	Tityridae	<i>Tityra semifasciata</i>	*	*
Rufous Piha	Cotingidae	<i>Lipaugus unirufus</i>	*	*
Blue-crowned Manakin	Pipridae	<i>Pipra coronata</i>	*	*
Red-capped Manakin	Pipridae	<i>Pipra mentalis</i>	*	*
Philadelphia Vireo*	Vireonidae	<i>Vireo philadelphicus</i>	*	*
Red-eyed Vireo*	Vireonidae	<i>Vireo olivaceus</i>	*	
Tawny-crowned Greenlet	Vireonidae	<i>Hylophilus ochraceiceps</i>	*	*
Lesser Greenlet	Vireonidae	<i>Hylophilus decurtatus</i>	*	*

Tropical Gnatcatcher	Sylviidae	<i>Polioptila plumbea</i>	*	*
Riverside Wren	Troglodytidae	<i>Thryothorus semibadius</i>	*	*
Black-bellied Wren	Troglodytidae	<i>Thryothorus fasciatoventris</i>	*	*
Swainson's Thrush*	Turdidae	<i>Catharus ustulatus</i>	*	
Tennessee Warbler*	Parulidae	<i>Vermivora peregrina</i>	*	*
Golden-winged Warbler**	Parulidae	<i>Vermivora chrysoptera</i>	*	
Chestnut-sided Warbler*	Parulidae	<i>Dendroica pensylvanica</i>	*	*
American Redstart*	Parulidae	<i>Setophaga ruticilla</i>	*	*
Bananaquit	Parulidae	<i>Coereba flaveola</i>	*	*
Black-cheeked Ant-Tanager	Thraupidae	<i>Habia atrimaxillaris</i>	*	*
White-shouldered Tanager	Thraupidae	<i>Tachyphonus luctuosus</i>	*	
Gray-headed Tanager	Thraupidae	<i>Eucometis penicillata</i>	*	*
Golden-hooded Tanager	Thraupidae	<i>Tangara larvata</i>	*	*
Shining Honeycreeper	Thraupidae	<i>Cyanerpes lucidas</i>		*
Red-legged Honeycreeper	Thraupidae	<i>Cyanerpes cyaneus</i>	*	
Blue-black Grosbeak	Cardinalidae	<i>Cyanocopsa cyanooides</i>	*	*
Baltimore Oriole*	Icteridae	<i>Icterus galbula</i>	*	*
Spot-crowned Euphonia	Fringillidae	<i>Carduelis psaltria</i>		*
*Neotropical migratory bird species				
** Globally listed as Near Threatened (NT; IUCN), and is a US bird of conservation concern (PIF).				

LITERATURE CITED

- Buckland, S. T., D. R. Anderson, K. P. Burnham, J. L. Laake, D. L. Borchers, and L. Thomas. 2001. Introduction to distance sampling, estimating abundance of biological populations. Oxford University Press, Oxford and New York.
- Buckland, S. T., K. P. Burnham, D. R. Anderson, and J. L. Laake. 1993. Density estimation using distance sampling. Chapman and Hall, London, UK.
- IUCN 2010. IUCN Red List of Threatened Species. Version 2010.2. <www.iucnredlist.org>. Downloaded on **30 June 2010**.
- Hutto R. L., S. M. Pletschet, and P. Hendricks. 1986. A Fixed-Radius Point Count Method for Non-Breeding and Breeding Season Use. The Auk 103:593-602
- Johnson, D. H. in press. In defense of indices: the case of bird surveys. Journal of Wildlife Management.
- Ralph, C. J., G. R. Geupel, P. Pyle, T. E. Martin, and D. F. DeSante. 1993. Handbook of field methods for monitoring landbirds USDA Forest Service General Technical Report PSW-GTR-144, Albany, CA. (<http://www.fs.fed.us/psw/publications/documents/gtr-144/>)
- Thompson, C. D. 2010. Orioles to Ocelots: Wisconsin's Costa Rica Connection. The Passenger Pigeon. 72(2): 97-104.
- Verner, J. 1988. Optimizing the duration of point counts for monitoring trends in bird populations. Research Note PSW-395. Pacific Southwest Forest and Range Experiment Stations, Forest Service, U.S. Department of Agriculture, Berkeley, CA. 4 pp.

Appendix A: Bird species density, detection probability (p), standard errors (SE) and lower (LC) and upper (UC) confidence intervals for all species detected Osa Conservation properties Piro and Cerro Osa, Osa Peninsula, Costa Rica 2010-2013.

Program Distance 6.0 was used for analysis.

Species	Density	SE	LC	UC	p	SE	LC	UC
Chestnut-backed Antbird	3.967	0.526	3.059	5.145	0.087	0.011	0.067	0.112
Lesser Greenlet	3.335	0.702	2.157	5.951	0.155	0.025	0.113	0.213
Chestnut-sided Warbler*	3.734	0.775	2.478	4.626	0.179	0.037	0.119	0.269
Black-cheeked Ant-Tanager**	2.897	0.394	2.193	4.756	0.050	0.005	0.041	0.061
Red-capped Manakin	2.552	0.425	1.833	3.553	0.068	0.011	0.049	0.094
Blue-crowned Manakin	2.322	0.364	1.699	3.171	0.063	0.010	0.046	0.087
Northern Bentbill	2.326	0.250	1.877	2.884	0.071	0.008	0.057	0.088
Bananaquit	1.913	0.634	0.990	3.697	0.192	0.064	0.100	0.372
Dot-winged Antwren	1.989	0.353	1.401	2.824	0.149	0.026	0.105	0.212
Dusky-capped Flycatcher	1.481	0.140	1.228	1.786	0.159	0.015	0.131	0.191
Gray-headed Tanager	1.745	0.757	0.754	4.039	0.120	0.052	0.052	0.277
Tawny-crowned Greenlet	1.127	0.134	0.891	1.425	0.253	0.030	0.200	0.320
Tennessee Warbler*	1.485	0.328	0.941	2.342	0.393	0.087	0.249	0.621
Tropical Gnatcatcher	1.701	0.314	1.185	2.442	0.175	0.032	0.122	0.251
Wedge-billed Woodcreeper	1.100	0.181	0.792	1.527	0.326	0.054	0.235	0.452
Black-faced Antthrush	0.132	0.028	0.087	0.200	0.502	0.105	0.331	0.760
Black-hooded Antshrike	0.746	0.073	0.615	0.906	0.220	0.022	0.181	0.267
Black-mandibled Toucan	0.761	0.120	0.557	1.041	0.112	0.018	0.082	0.154
Black-striped Woodcreeper	0.563	0.070	0.440	0.721	0.200	0.025	0.156	0.256
Black-throated Trogon	0.650	0.120	0.451	0.937	0.146	0.027	0.101	0.210
Blue Ground-Dove	0.353	0.099	0.194	0.641	0.119	0.033	0.065	0.216
Blue-black Grosbeak	0.083	0.023	0.046	0.150	0.352	0.099	0.196	0.632
Bright-rumped Attila	0.396	0.044	0.317	0.495	0.254	0.028	0.204	0.318
Buff-throated Foliage-gleaner	0.178	0.047	0.104	0.305	0.422	0.111	0.246	0.725
Cocoa Woodcreeper	0.878	0.155	0.618	1.246	0.132	0.023	0.093	0.187
Gartered Trogon	0.091	0.023	0.055	0.151	0.471	0.117	0.285	0.781

Golden-crowned Spadebill	0.885	0.200	0.560	1.399	0.342	0.078	0.217	0.541
Great Tinamou	0.068	0.019	0.038	0.121	0.438	0.123	0.247	0.776
Green Shrike-Vireo	0.080	0.018	0.050	0.127	0.374	0.084	0.236	0.593
Little Tinamou	0.091	0.022	0.056	0.147	0.427	0.101	0.264	0.692
Long-billed Gnatwren	0.736	0.200	0.422	1.282	0.112	0.030	0.064	0.195
Mealy Parrot	0.425	0.086	0.285	0.635	0.187	0.038	0.125	0.279
Orange-billed Sparrow	0.338	0.095	0.192	0.593	0.500	0.141	0.284	0.878
Pale-billed Woodpecker	0.161	0.030	0.110	0.234	0.370	0.070	0.254	0.539
Red-crowned Woodpecker	0.276	0.061	0.177	0.431	0.374	0.083	0.240	0.582
Red-lored Parrot	0.474	0.049	0.386	0.582	0.225	0.023	0.183	0.276
Riverside Wren	0.566	0.157	0.330	0.972	0.279	0.077	0.163	0.479
Rufous Piha	0.339	0.049	0.255	0.453	0.266	0.038	0.200	0.355
Scarlet Macaw	0.348	0.087	0.213	0.569	0.189	0.047	0.115	0.309
Short-billed Pigeon	0.254	0.036	0.191	0.336	0.234	0.033	0.177	0.311
Slaty-tailed Trogon	0.207	0.039	0.142	0.302	0.286	0.054	0.196	0.417
Spot-crowned Euphonia	0.528	0.143	0.301	0.924	0.099	0.027	0.057	0.173
Summer Tanager*	0.561	0.092	0.406	0.777	0.379	0.062	0.274	0.524
White-crowned Parrot	0.256	0.134	0.094	0.698	0.202	0.105	0.074	0.550
White-shouldered Tanager	0.528	0.087	0.376	0.742	0.156	0.026	0.111	0.219
Yellow-throated Vireo	0.323	0.067	0.211	0.496	0.298	0.062	0.195	0.457
*Neotropical migratory species								
**IUCN Endangered species (EN)								

Appendix B: Bird species density, detection probability (p), standard errors (SE) and lower (LC) and upper (UC) confidence intervals for species detected in the Neenah Paper restoration plot at Cerro Osa, Osa Peninsula, Costa Rica 2012-2013. Program Distance 6.0 was used for analysis.

Species	Density	SE	LC	UC	p	SE	LC	UC
Riverside Wren	3.258	1.3958	1.3795	7.6948	0.38366	9.79E-02	0.22676	0.64911
Black-cheeked Ant-Tanager**	2.148	1.0148	0.82098	5.6202	0.65339	0.14497	0.40949	0.921
Northern Bentbill	1.780	0.96371	0.60055	5.2769	0.73561	0.19177	0.41545	0.961
Lesser Greenlet	1.719	0.35444	1.1329	2.6084	0.68131	0.10549	0.49622	0.93543
Blue Ground-Dove	1.699	0.79087	0.68311	4.2245	0.5326	0.2086	0.24002	0.784
Gray-headed Tanager	1.497	0.78719	0.52485	4.268	0.74238	0.21362	0.39904	0.917
Cocoa Woodcreeper	1.141	0.35602	0.60289	2.1592	0.64923	0.1246	0.43286	0.97377
Golden-hooded Tanager	1.111	0.40811	0.53326	2.3156	0.699	0.29409	0.54116	0.832
Gray-chested Dove	1.111	0.37073	0.56634	2.1803	0.742	0.24689	0.59117	0.903
Black-bellied Wren	0.935	0.38992	0.40283	2.1721	0.7127	0.17926	0.4132	0.875
Chestnut-sided Warbler*	0.344	0.12338	0.16442	0.71978	0.86059	0.2409	0.4568	0.925
Dusky-capped Flycatcher	0.297	0.20689	7.52E-02	1.1734	0.67849	0.17294	0.38465	0.767
*Neotropical migratory species								
**IUCN endangered species (EN)								

Appendix C: Threatened and/or Endemic species found on the Osa Peninsula, Costa Rica.**BirdLife International 2012.**

Common Name	Scientific Name	Season	Status
Mangrove Hummingbird	<i>Amazilia boucardi</i>	CR Endemic	Endangered
Bairds Trogon	<i>Trogon bairdii</i>	Regional Endemic	Near Threatened
Turquoise Cotinga	<i>Cotinga ridgwayi</i>	Regional Endemic	Vulnerable
Three-wattled Bellbird	<i>Procnias tricarunculatus</i>	Non-endemic	Vulnerable
Yellow-billed Cotinga	<i>Carpodectes antoniae</i>	Regional Endemic	Endangered
Black-cheeked Ant-Tanager	<i>Habia atrimaxillaris</i>	Osa endemic	Endangered
Charming Hummingbird	<i>Amazilia decora</i>	Regional Endemic	Least Concern
Golden-naped Woodpecker	<i>Melanerpes chrysauchen</i>	Regional Endemic	Least Concern
Fiery-billed Araçari	<i>Pteroglossus frantzii</i>	Regional Endemic	Least Concern

Appendix D. Comprehensive list of all bird species observed on Osa Conservation properties from 2010 - 2013. The standardized common names of bird species are used.

(A.O.U. Check-list of North American Birds 2011).

Common Name	Scientific Name	Alpha Code
Great Tinamou	<i>Tinamus major</i>	GRTI
Little Tinamou	<i>Crypturellus soui</i>	LITI
Great Curassow	<i>Crax rubra</i>	GRCU
Gray-headed Chachalaca	<i>Ortalis cinereiceps</i>	GHEC
Crested Guan	<i>Penelope purpurascens</i>	CRGU
Marbled Wood-Quail	<i>Odontophorus gujanensis</i>	MAWQ
Bare-throated Tiger-Heron	<i>Tigrisoma mexicanum</i>	BTTH
Little Blue Heron	<i>Egretta caerulea</i>	LBHE
Green Heron	<i>Butorides virescens</i>	GRHE
White Ibis	<i>Eudocimus albus</i>	WHIB
Black Vulture	<i>Coragyps atratus</i>	BLVU
Turkey Vulture	<i>Cathartes aura</i>	TUVU
King Vulture	<i>Sarcoramphus papa</i>	KIVU
Gray-headed Kite	<i>Leptodon cayanensis</i>	GHKI
Double-toothed Kite	<i>Harpagus bidentatus</i>	DTKI
Swallow-tailed Kite	<i>Elanoides forficatus</i>	STKI
Tiny Hawk	<i>Accipiter superciliosus</i>	TIHA
White Hawk	<i>Leucopternis albicollis</i>	WHHA
Gray Hawk	<i>Asturina nitidus</i>	GRHA
Roadside Hawk	<i>Buteo magnirostris</i>	ROHA
Broad-winged Hawk	<i>Buteo platypterus</i>	BWHA
Zone-tailed Hawk	<i>Buteo albonotatus</i>	ZTHA
Great Black-Hawk	<i>Buteogallus urubitinga</i>	GRBH
Common Black-Hawk	<i>Buteogallus anthracinus</i>	COBH
Bat Falcon	<i>Falco ruficularis</i>	BAFA
Peregrine Falcon	<i>Falco peregrinus</i>	PEFA
Yellow-headed Caracara	<i>Milvago chimachima</i>	YHCA
Laughing Falcon	<i>Herpetotheres cachinnans</i>	LAFA
Barred Forest-Falcon	<i>Micrastur ruficollis</i>	BAFF
Collared Forest-Falcon	<i>Micrastur semitorquatus</i>	COFF
Gray-necked Wood-Rail	<i>Aramides cajanea</i>	GNWR
Purple Gallinule	<i>Porphyrio martinica</i>	PUGA
Northern Jacana	<i>Jacana spinosa</i>	NOJA
Willet	<i>Tringa semipalmata</i>	WILL
Spotted Sandpiper	<i>Actitis macularia</i>	SPSA
Pale-vented Pigeon	<i>Patagioenas cayennensis</i>	PVPI
Short-billed Pigeon	<i>Patagioenas nigrirostris</i>	SBPI
Ruddy Ground-Dove	<i>Columbina talpacoti</i>	RUGD
Blue Ground-Dove	<i>Claravis pretiosa</i>	BLGD

White-tipped Dove	<i>Leptotila verreauxi</i>	WTDO
Gray-chested Dove	<i>Leptotila cassini</i>	GCDO
Ruddy Quail-Dove	<i>Geotrygon montana</i>	RUQD
Crimson-fronted Parakeet	<i>Aratinga finschi</i>	CFPA
Orange-chinned Parakeet	<i>Brotogeris jugularis</i>	OCPA
Brown-hooded Parrot	<i>Pionopsitta haematotis</i>	BHOP
White-crowned Parrot	<i>Pionus senilis</i>	WCPA
Scarlet Macaw	<i>Ara macao</i>	SCMA
Red-lored Parrot	<i>Amazona autumnalis</i>	RLPA
Mealy Parrot	<i>Amazona farinosa</i>	MEAP
Mangrove Cuckoo	<i>Coccyzus minor</i>	MACU
Striped Cuckoo	<i>Tapera naevia</i>	STCU
Squirrel Cuckoo	<i>Piaya cayana</i>	SQCU
Smooth-billed Ani	<i>Crotophaga ani</i>	SBAN
Spectacled Owl	<i>Pulsatrix perspicillata</i>	SPEO
Crested Owl	<i>Lophotrix cristata</i>	CROW
Black-and-white Owl	<i>Ciccaba nigrolineata</i>	BLWO
Tropical Screech Owl	<i>Otus Choliba</i>	TRSO
Vermiculated Screech-Owl	<i>Megascops guatemalae</i>	VESO
Common Pauraque	<i>Nyctidromus albicollis</i>	COPA
Chuck-will's-widow	<i>Caprimulgus carolinensis</i>	CWWI
Common Potoo	<i>Nyctibius griseus</i>	CPOT
Black Swift	<i>Cypseloides niger</i>	BLSW
Chestnut-collared Swift	<i>Streptoprocne rutila</i>	CCSW
White-collared Swift	<i>Streptoprocne zonaris</i>	WCSW
Costa Rican Swift	<i>Chaetura fumosa</i>	CRSW
Lesser Swallow-tailed Swift	<i>Panyptila cayennensis</i>	LASW
Stripe-throated Hermit	<i>Phaethornis striigularis</i>	SRTH
Long-billed Hermit	<i>Phaethornis longirostris</i>	LBIH
Bronzy Hermit	<i>Glaucis aenea</i>	BRHE
Band-tailed Barbthroat	<i>Threnetes ruckeri</i>	BTBA
White-tipped Sicklebill	<i>Eutoxeres aquila</i>	WTSI
Purple-crowned Fairy	<i>Heliothryx barroti</i>	PCFA
Charming Hummingbird	<i>Amazilia decora</i>	CHHU
White-necked Jacobin	<i>Florisuga mellivora</i>	WNJA
Violet-crowned Woodnymph	<i>Thalurania colombica</i>	VCWO
Blue-throated Goldentail	<i>Hylocharis eliciae</i>	BTRG
Rufous-tailed Hummingbird	<i>Amazilia tzactl</i>	RTAH
Brown Violet-ear	<i>Colibri delphinae</i>	BRVI
Long-billed Starthroat	<i>Heliomaster longirostris</i>	LBST
White-crested Coquette	<i>Lophornis adorabilis</i>	WCCO
Gartered Trogon	<i>Trogon Caligatus</i>	GATR
Black-throated Trogon	<i>Trogon rufus</i>	BTHT

Baird's Trogon	<i>Trogon bairdii</i>	BATR
Slaty-tailed Trogon	<i>Trogon massena</i>	STTR
Blue-crowned Motmot	<i>Momotus momota</i>	BCMO
Ringed Kingfisher	<i>Ceryle torquata</i>	RIKI
Green Kingfisher	<i>Chloroceryle americana</i>	GKIN
American Pygmy Kingfisher	<i>Chloroceryle aenea</i>	APKI
Amazon Kingfisher	<i>Chloroceryle amazona</i>	AMKI
White-necked Puffbird	<i>Notharchus macrorhynchos</i>	WNPU
White-whiskered Puffbird	<i>Malacoptila panamensis</i>	WWPU
Rufous-tailed Jacamar	<i>Galbula ruficauda</i>	RTJA
Chestnut-mandibled Toucan	<i>Ramphastos swainsonii</i>	CMTO
Fiery-billed Araçari	<i>Pteroglossus frantzii</i>	FBAR
Golden-naped Woodpecker	<i>Melanerpes chrysauchen</i>	GNWO
Red-crowned Woodpecker	<i>Melanerpes rubricapillus</i>	RCRW
Rufous-winged Woodpecker	<i>Piculus simplex</i>	RCRW
Red-rumped Woodpecker	<i>Veniliornis kirkii</i>	RRWO
Olivaceous Piculet	<i>Picumnus olivaceus</i>	OLPI
Pale-billed Woodpecker	<i>Campephilus guatemalensis</i>	PBIW
Lineated Woodpecker	<i>Dryocopus lineatus</i>	LIWO
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>	YBSA
Buff-throated Foliage-gleaner	<i>Automolus ochrolaemus</i>	BFFG
Plain Xenops	<i>Xenops minutus</i>	PLXE
Northern Barred-Woodcreeper	<i>Dendrocolaptes sanctithomae</i>	NOBW
Tawny-winged Woodcreeper	<i>Dendrocincla anabatina</i>	TWWO
Long-tailed Woodcreeper	<i>Deconychura longicauda</i>	LTWO
Wedge-billed Woodcreeper	<i>Glyphorhynchus spirurus</i>	WBWO
Streak-headed Woodcreeper	<i>Lepidocolaptes souleyetii</i>	SHWO
Cocoa Woodcreeper	<i>Xiphorhynchus susurrans</i>	COWO
Black-striped Woodcreeper	<i>Xiphorhynchus lachrymosus</i>	BSWO
Great Antshrike	<i>Taraba major</i>	GANT
Black-hooded Antshrike	<i>Thamnophilus bridgesi</i>	BHOA
Russet Antshrike	<i>Thamnistes anabatinus</i>	RUAN
Dusky Antbird	<i>Cercomacra tyrannina</i>	DUAN
Chestnut-backed Antbird	<i>Myrmeciza exsul</i>	CBAN
Bicolored Antbird	<i>Gymnopithys leucaspis</i>	BIAN
Dot-winged Antwren	<i>Microrhopias quixensis</i>	DWAN
Streak-chested Antpitta	<i>Hylopezus perspicillatus</i>	SCHA
Black-faced Antthrush	<i>Formicarius analis</i>	BFAN
Golden-crowned Spadebill	<i>Platyrrinchus coronatus</i>	GCRS
Paltry Tyrannulet	<i>Zimmerius vilissimus</i>	PATY
Southern Beardless-Tyrannulet	<i>Camptostoma obsoletum</i>	SOBT
Yellow-bellied Eleania	<i>Elaenia flavogaster</i>	YBEL
Piratic Flycatcher	<i>Legatus leucophauius</i>	PIFL

Yellow-olive Flycatcher	<i>Tolmomyias sulphurescens</i>	YOFL
Common Tody-Flycatcher	<i>Todirostrum cinereum</i>	COTF
Slate-headed Tody-Flycatcher	<i>Poecilatriccus sylvia</i>	SHTF
Scale-crested Pygmy-Tyrant	<i>Lophotriccus pileatus</i>	SCPT
Northern Bentbill	<i>Oncostoma cinereigulare</i>	NOBE
Ochre-bellied Flycatcher	<i>Mionectes oleagineus</i>	OBFL
Sulphur-rumped Flycatcher	<i>Myiobius sulphureipygius</i>	SRFL
Bright-rumped Attila	<i>Attila spadiceus</i>	BRAT
Rufous Mourner	<i>Rhytipterna holerythra</i>	RMOU
Eye-ringed Flatbill	<i>Rhynchocyclus brevirostris</i>	ERFL
Olive-sided Flycatcher	<i>Contopus cooperi</i>	OSFL
Eastern Wood-Pewee	<i>Contopus virens</i>	EAWP
Tropical Pewee	<i>Contopus cinereus</i>	TRPE
Yellow-bellied Flycatcher	<i>Empidonax flaviventris</i>	YBFL
Least Flycatcher	<i>Empidonax minimus</i>	LEFL
Scissor-tailed Flycatcher	<i>Tyrannus forficatus</i>	STFL
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	GCFL
Dusky-capped Flycatcher	<i>Myiarchus tuberculifer</i>	DCFL
Boat-billed Flycatcher	<i>Megarhynchus pitangua</i>	BOBF
Great Kiskadee	<i>Pitangus sulphuratus</i>	GKIS
Social Flycatcher	<i>Myiozetetes similis</i>	SOFL
Gray-capped Flycatcher	<i>Myiozetetes granadensis</i>	GCAF
Streaked Flycatcher	<i>Myiodynastes maculatus</i>	STRF
Tropical Kingbird	<i>Tyrannus melancholicus</i>	TRKI
Rufous Piha	<i>Lipaugus unirufus</i>	RUFP
Thrushlike Schiffornis	<i>Schiffornis turdinus</i>	TLSC
Rose-throated Becard	<i>Pachyramphus aglaiae</i>	RTBE
White-winged Becard	<i>Pachyramphus polychopterus</i>	WWBE
Masked Tityra	<i>Tityra semifasciata</i>	MATI
Black-crowned Tityra	<i>Tityra inquisitor</i>	BCRT
Turquoise Cotinga	<i>Cotinga ridgwayi</i>	TUCO
Orange-collared Manakin	<i>Manacus aurantiacus</i>	WCOM
Blue-crowned Manakin	<i>Pipra coronata</i>	BCRM
Red-capped Manakin	<i>Pipra mentalis</i>	RCMA
Yellow-throated Vireo	<i>Vireo flavifrons</i>	YTVI
Philadelphia Vireo	<i>Vireo philadelphicus</i>	PHVI
Yellow-green Vireo	<i>Vireo flavoviridis</i>	YGVI
Red-eyed Vireo	<i>Vireo olivaceus</i>	REVI
Tawny-crowned Greenlet	<i>Hylophilus ochraceiceps</i>	TCGR
Lesser Greenlet	<i>Hylophilus decurtatus</i>	LESG
Green Shrike-Vireo	<i>Vireolanius pulchellus</i>	GRSV
Mangrove Swallow	<i>Tachycineta albilinea</i>	MANS
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	CLSW

Gray-breasted Martin	<i>Progne chalybea</i>	GYBM
Bank Swallow	<i>Riparia raria</i>	BANS
Northern Rough-winged	<i>Stelgidopteryx serripennis</i>	NRWS
Southern Rough-winged	<i>Stelgidopteryx ruficollis</i>	SRWS
Barn Swallow	<i>Hirundo rustica</i>	BANS
Long-billed Gnatwren	<i>Ramphocaenus melanurus</i>	LBGN
Tropical Gnatcatcher	<i>Polioptila plumbea</i>	TRGN
Riverside Wren	<i>Thryothorus semibadius</i>	RIWR
Plain Wren	<i>Thryothorus modestus</i>	PLWR
Black-bellied Wren	<i>Thryothorus fasciatoventris</i>	BBEW
House Wren	<i>Troglodytes aedon</i>	HOWR
Scaly-breasted Wren	<i>Microcerculus marginatus</i>	SCBW
Swainson's Thrush	<i>Catharus ustulatus</i>	SWTH
White-throated Thrush	<i>Turdus assimilis</i>	WTTH
Clay-colored Thrush	<i>Turdus grayi</i>	CCTH
Tennessee Warbler	<i>Vermivora peregrina</i>	TEWA
Golden-winged Warbler	<i>Vermivora chrysoptera</i>	GWWA
Yellow Warbler	<i>Dendroica petechia</i>	YWAR
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>	CSWA
Black-and-white Warbler	<i>Mniotilta varia</i>	BAWW
American Redstart	<i>Setophaga ruticilla</i>	AMRE
Prothonotary Warbler	<i>Protonotaria citrea</i>	PROW
Ovenbird	<i>Seiurus aurocapilla</i>	OVEN
Worm-eating Warbler	<i>Helmitheros vermivorum</i>	WEWA
Northern Waterthrush	<i>Seiurus noveboracensis</i>	NOWA
Hooded Warbler	<i>Wilsonia citrina</i>	HOWA
Mourning Warbler	<i>Oporornis philadelphia</i>	MOWA
Kentucky Warbler	<i>Oporornis formosus</i>	KEWA
Buff-rumped Warbler	<i>Phaeothlypis fulvicauda</i>	BURW
Bananaquit	<i>Coereba flaveola</i>	BANA
Black-cheeked Ant-Tanager	<i>Habia atrimaxillaris</i>	BCAT
White-shouldered Tanager	<i>Tachyphonus luctuosus</i>	WSTA
White-lined Tanager	<i>Tachyphonus rufus</i>	WLTA
Gray-headed Tanager	<i>Eucometis penicillata</i>	GHET
White-throated Shrike-Tanager	<i>Lanio leucothorax</i>	WTST
Summer Tanager	<i>Piranga rubra</i>	SUTA
Scarlet Tanager	<i>Piranga olivacea</i>	SCTA
Cherrie's Tanager	<i>Ramphocelus costaricensis</i>	CHET
Golden-hooded Tanager	<i>Tangara larvata</i>	GHOT
Bay-headed Tanager	<i>Tangara gyrola</i>	BHTA
Blue-gray Tanager	<i>Thraupis episcopus</i>	BGTA
Palm Tanager	<i>Thraupis palmarum</i>	PALT
Green Honeycreeper	<i>Chlorophanes spiza</i>	GRHO

Shining Honeycreeper	<i>Cyanerpes lucidus</i>	SHHO
Red-legged Honeycreeper	<i>Cyanerpes cyaneus</i>	RLHO
Blue Dacnis	<i>Dacnis cayana</i>	BLDA
Thick-billed Seed-Finch	<i>Oryzoborus funereus</i>	TBSF
Variable Seedeater	<i>Sporophila americana</i>	VASE
Ruddy-breasted Seedeater	<i>Sporophila minuta</i>	RBSE
Orange-billed Sparrow	<i>Arremon aurantiirostris</i>	OBSP
Black-striped Sparrow	<i>Arremonops conirostris</i>	BSTS
Buff-throated Saltator	<i>Saltator maximus</i>	BTSA
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	RBGR
Blue-black Grosbeak	<i>Cyanocompsa cyanooides</i>	BGRO
Eastern Meadowlark	<i>Sturnella magna</i>	EAME
Great-tailed Grackle	<i>Quiscalus mexicanus</i>	GTGR
Baltimore Oriole	<i>Icterus galbula</i>	BAOR
Scarlet-rumped Cacique	<i>Cacicus uropygialis</i>	SRCA
Yellow-billed Cacique	<i>Amblycercus holosericeus</i>	YBIC
Yellow-crowned Euphonia	<i>Euphonia luteicapilla</i>	YCEU
White-vented Euphonia	<i>Euphonia minuta</i>	WVEU
Spot-crowned Euphonia	<i>Euphonia imitans</i>	SPCE

Appendix E. Comprehensive list of all bird species observed on the Osa Peninsula. The standardized common names of bird species are used. (A.O.U. Check-list of North American Birds 2011).

Common Name	Scientific Name	Alpha Code
Great Tinamou	<i>Tinamus major</i>	GRTI
Little Tinamou	<i>Crypturellus soui</i>	LITI
Black-bellied Whistling-Duck	<i>Dendrocygna autumnalis</i>	BBWD
Muscovy Duck	<i>Cairina moschata</i>	MUDU
Masked Duck	<i>Nomonyx dominicus</i>	MADU
Blue-winged Teal	<i>Anas discors</i>	BWTE
Ring-necked Duck	<i>Aythya collaris</i>	RNDU
Lesser Scaup	<i>Aythya affinis</i>	LESC
Least Grebe	<i>Tachybaptus dominicus</i>	LEGR
Pied-billed Grebe	<i>Podilymbus podiceps</i>	PBGR
Great Curassow	<i>Crax rubra</i>	GRCU
Gray-headed Chachalaca	<i>Ortalis cinereiceps</i>	GHEC
Crested Guan	<i>Penelope purpurascens</i>	CRGU
Marbled Wood-Quail	<i>Odontophorus gujanensis</i>	MAWQ
Brown Booby	<i>Sula leucogaster</i>	BRBO
Masked Booby	<i>Sula dactylatra</i>	MABO
Blue-footed Booby	<i>Sula nebouxii</i>	BFBO
Red-footed Booby	<i>Sula sula</i>	RFBO
Brown Pelican	<i>Pelecanus occidentalis</i>	BRPE
Neotropic Cormorant	<i>Phalacrocorax brasilianus</i>	NECO
Anhinga	<i>Anhinga anhinga</i>	ANHI
Magnificent Frigatebird	<i>Fregata magnificens</i>	MAFR
Jabiru	<i>Jabiru mycteria</i>	JABI
Wood Stork	<i>Mycteria americana</i>	WOST
Bare-throated Tiger-Heron	<i>Tigrisoma mexicanum</i>	BTTH
Fasciated Tiger-Heron	<i>Tigrisoma fasciatum</i>	FTHE
Pinnated Bittern	<i>Botaurus pinnatus</i>	PIBI
Agami Heron	<i>Agamia agami</i>	AGHE
Little Blue Heron	<i>Egretta caerulea</i>	LBHE
Great Egret	<i>Ardea alba</i>	GREG
Great Blue Heron	<i>Ardea herodias</i>	GBHE
Cattle Egret	<i>Bubulcus ibis</i>	CAEG
Snowy Egret	<i>Egretta thula</i>	SNEG
Reddish Egret	<i>Egretta rufescens</i>	REEG
Least Bittern	<i>Ixobrychus exilis</i>	LEBI
Green Heron	<i>Butorides virescens</i>	GRHE
Tricolored Heron	<i>Egretta tricolor</i>	TRHE
Boat-billed Heron	<i>Cochlearius cochlearius</i>	BBHE

Yellow-crowned Night-Heron	<i>Nyctanassa violacea</i>	YCNH
Roseate Spoonbill	<i>Platalea ajaja</i>	ROSP
White Ibis	<i>Eudocimus albus</i>	WHIB
Sunbittern	<i>Eurypyga helias</i>	SUNB
Black Vulture	<i>Coragyps atratus</i>	BLVU
Turkey Vulture	<i>Cathartes aura</i>	TUVU
King Vulture	<i>Sarcoramphus papa</i>	KIVU
Osprey	<i>Pandion haliaetus</i>	OSPR
Gray-headed Kite	<i>Leptodon cayanensis</i>	GHKI
Black-collared Hawk	<i>Busarellus nigricollis</i>	BCHA
Hook-billed Kite	<i>Chondrohierax uncinatus</i>	HBKI
Double-toothed Kite	<i>Harpagus bidentatus</i>	DTKI
Swallow-tailed Kite	<i>Elanoides forficatus</i>	STKI
Pearl Kite	<i>Gampsonyx swainsonii</i>	PEKI
White-tailed Kite	<i>Elanus leucurus</i>	WTKI
Plumbeous Kite	<i>Ictinia plumbea</i>	PLKI
Mississippi Kite	<i>Ictinia mississippiensis</i>	MIKI
Bicolored Hawk	<i>Accipiter bicolor</i>	BIHA
Tiny Hawk	<i>Accipiter superciliosus</i>	TIHA
Northern Harrier	<i>Circus cayaneus</i>	NOHA
Crane Hawk	<i>Geranospiza caerulescens</i>	CRHA
White Hawk	<i>Leucopternis albicollis</i>	WHHA
Barred Hawk	<i>Leucopternis princeps</i>	BAHA
Gray Hawk	<i>Asturina nitidus</i>	GRHA
Roadside Hawk	<i>Buteo magnirostris</i>	ROHA
Broad-winged Hawk	<i>Buteo platypterus</i>	BWHA
Short-tailed Hawk	<i>Buteo brachyurus</i>	STHA
White-tailed Hawk	<i>Buteo albicaudatus</i>	WTHA
Zone-tailed Hawk	<i>Buteo albonotatus</i>	ZTHA
Great Black-Hawk	<i>Buteogallus urubitinga</i>	GRBH
Common Black-Hawk	<i>Buteogallus anthracinus</i>	COBH
Mangrove Black-Hawk	<i>Buteogallus subtilis</i>	MABH
Solitary Eagle	<i>Harpyhaliaetus solitarius</i>	SOEA
Swainson's Hawk	<i>Buteo swainsoni</i>	SWHA
Red-tailed Hawk	<i>Buteo jamaicensis</i>	RTHA
Harpy Eagle	<i>Harpia harpyja</i>	HAEA
Crested Eagle	<i>Morphnus guianensis</i>	CREA
Black-and-white Hawk Eagle	<i>Spizastur melanoleucus</i>	BAWH
Ornate Hawk-Eagle	<i>Spizaetus ornatus</i>	ORHE
Black Hawk-Eagle	<i>Spizaetus tyrannus</i>	BLHE
Red-throated Caracara	<i>Daptrius americanus</i>	RTCA
American Kestrel	<i>Falco sparverius</i>	MAKE
Merlin	<i>Falco columbarius</i>	MERL

Bat Falcon	<i>Falco ruficularis</i>	BAFA
Peregrine Falcon	<i>Falco peregrinus</i>	PEFA
Crested Caracara	<i>Caracara plancus</i>	CRCA
Yellow-headed Caracara	<i>Milvago chimachima</i>	YHCA
Laughing Falcon	<i>Herpetotheres cachinnans</i>	LAFA
Barred Forest-Falcon	<i>Micrastur ruficollis</i>	BAFF
Collared Forest-Falcon	<i>Micrastur semitorquatus</i>	COFF
Gray-necked Wood-Rail	<i>Aramides cajanea</i>	GNWR
Uniform Crake	<i>Amaurolimnas concolor</i>	UNCR
White-throated Crake	<i>Laterallus albigularis</i>	WTCR
Gray -breasted Crake	<i>Laterallus exilis</i>	GBCR
Black Rail	<i>Laterallus Jamaicensis</i>	BLRA
Sora	<i>Porzana carolina</i>	SORA
Paint-billed Crake	<i>Neocrex eeythrops</i>	PBCR
Purple Gallinule	<i>Porphyrio martinica</i>	PUGA
American Coot	<i>Fulica americana</i>	AMCO
Common Moorhen	<i>Gallinula cholopus</i>	COMO
Wattled Jacana	<i>Jacana jacana</i>	WAJA
Northern Jacana	<i>Jacana spinosa</i>	NOJA
Sungrebe	<i>Heliornis fulica</i>	SUNG
Limpkin	<i>Aramus guarauna</i>	LIMP
Collared Plover	<i>Charadrius collaris</i>	COPL
Snowy Plover	<i>Charadrius alexandrinus</i>	SNPL
Wilson's Plover	<i>Charadrius wilsonia</i>	WIPL
Semipalmated Plover	<i>Charadrius semipalmatus</i>	SEPL
Killdeer	<i>Charadrius vociferus</i>	KILL
Black-bellied Plover	<i>Pluvialis squatarola</i>	BBPL
American Golden-Plover	<i>Pluvialis dominica</i>	AMGP
Southern Lapwing	<i>Vanellus chilensis</i>	SOLA
American Oystercatcher	<i>Haematopus palliatus</i>	AMOY
Black-necked Stilt	<i>Himantopus mexicanus</i>	BNST
Marbled Godwit	<i>Limosa fedoa</i>	MAGO
Whimbrel	<i>Numenius phaeopus</i>	WHIM
Willet	<i>Tringa semipalmata</i>	WILL
Solitary Sandpiper	<i>Tringa solitaria</i>	SOSA
Greater Yellowlegs	<i>Tringa melanoleuca</i>	GRYE
Lesser Yellowlegs	<i>Tringa flavipes</i>	LEYE
Wandering Tattler	<i>Tringa inacana</i>	WATA
Spotted Sandpiper	<i>Actitis macularia</i>	SPSA
Upland Sandpiper	<i>Bartramia longicauda</i>	UPSA
Ruddy Turnstone	<i>Arenaria interpres</i>	RUTU
Surfbird	<i>Aphriza virgata</i>	SURF
Sanderling	<i>Calidris alba</i>	SAND

Semipalmated Sandpiper	<i>Calidris pusilla</i>	SESA
Western Sandpiper	<i>Calidris mauri</i>	WESA
Least Sandpiper	<i>Calidris minutilla</i>	LESA
Pectoral Sandpiper	<i>Calidris melanotos</i>	PESA
White-rumped Sandpiper	<i>Calidris fuscicollis</i>	WRSA
Baird's Sanpiper	<i>Calidris bairdii</i>	BASA
Stilt Sandpiper	<i>Calidris himantopus</i>	STSA
Red Knot	<i>Calidris canutus</i>	REKN
Short-billed Dowitcher	<i>Limnodromus griseus</i>	SBDO
Long-billed Dowitcher	<i>Limnodromus scolopaceus</i>	LBDO
Wilson's Snipe	<i>Gallinago delicata</i>	WISN
Wilson's Phalarope	<i>Phalaropus tricolor</i>	WIPH
Red-necked Phalarope	<i>Phalaropus lobatus</i>	RNPH
Laughing Gull	<i>Larus articilla</i>	LAGU
Franklin's Gull	<i>Larus pipixcan</i>	FRGU
Caspian Tern	<i>Hydroprogne caspia</i>	CATE
Royal Tern	<i>Thalasseus maximus</i>	ROYT
Elegant Tern	<i>Thalasseus elegans</i>	ELTE
Gull-billed Tern	<i>Gelochelidon nilotica</i>	GBTE
Sanwich Tern	<i>Thalasseus sandivicensis</i>	SATE
Common Tern	<i>Sterna hirundo</i>	COTE
Least Tern	<i>Sternula antillarum</i>	LETE
Bridled Tern	<i>Onychoprion anaethetus</i>	BRTE
Black Tern	<i>Chlidonias niger</i>	BRTE
Brown Noddy	<i>Anous stolidus</i>	BRNO
Black Skimmer	<i>Rynchops niger</i>	BLSK
Rock Pigeon	<i>Columba livia</i>	ROPI
Pale-vented Pigeon	<i>Patagioenas cayennensis</i>	PVPI
Short-billed Pigeon	<i>Patagioenas nigrirostris</i>	SBPI
Mourning Dove	<i>Zenaida macroura</i>	MODO
Plain-breasted Ground-Dove	<i>Columbina minuta</i>	PBGD
Ruddy Ground-Dove	<i>Columbina talpacoti</i>	RUGD
Blue Ground-Dove	<i>Claravis pretiosa</i>	BLGD
Gray-headed Dove	<i>Leptotila plumbeiceps</i>	GHDO
White-tipped Dove	<i>Leptotila verreauxi</i>	WTDO
Gray-chested Dove	<i>Leptotila cassini</i>	GCDO
Ruddy Quail-Dove	<i>Geotrygon montana</i>	RUQD
Crimson-fronted Parakeet	<i>Aratinga finschi</i>	CFPA
Orange-chinned Parakeet	<i>Brotogeris jugularis</i>	OCPA
Brown-hooded Parrot	<i>Pionopsitta haematotis</i>	BHOP
Blue-headed Parrot	<i>Pionus menstruus</i>	BHEP
White-crowned Parrot	<i>Pionus senilis</i>	WCPA
Scarlet Macaw	<i>Ara macao</i>	SCMA

Red-lored Parrot	<i>Amazona autumnalis</i>	RLPA
Mealy Parrot	<i>Amazona farinosa</i>	MEAP
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	BBCU
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	YBCU
Mangrove Cuckoo	<i>Coccyzus minor</i>	MACU
Pheasant Cuckoo	<i>Dromococcyx phasianellus</i>	PHCU
Striped Cuckoo	<i>Tapera naevia</i>	STCU
Squirrel Cuckoo	<i>Piaya cayana</i>	SQCU
Groove-billed Ani	<i>Crotophaga sulcirostris</i>	GBAN
Smooth-billed Ani	<i>Crotophaga ani</i>	SBAN
Barn Owl	<i>Tyto alba</i>	BANO
Spectacled Owl	<i>Pulsatrix perspicillata</i>	SPEO
Crested Owl	<i>Lophotrix cristata</i>	CROW
Striped Owl	<i>Pseudoscops Clamator</i>	STRO
Black-and-white Owl	<i>Ciccaba nigrolineata</i>	BLWO
Mottled Owl	<i>Ciccaba virgata</i>	MOOW
Tropical Screech Owl	<i>Otus Choliba</i>	TRSO
Vermiculated Screech-Owl	<i>Megascops guatemalae</i>	VESO
Common Pauraque	<i>Nyctidromus albicollis</i>	COPA
Chuck-will's-widow	<i>Caprimulgus carolinensis</i>	CWWI
Rufous Nightjar	<i>Caprimulgus rufus</i>	RUNI
Eastern Whip-poor-will	<i>Caprimulgus vociferus</i>	EWPW
White-tailed Nightjar	<i>Caprimulgus cayennensis</i>	WTNI
Lesser Nighthawk	<i>Chordeiles acutipennis</i>	LENI
Common Nighthawk	<i>Chordeiles minor</i>	CONI
Short-tailed Nighthawk	<i>Chordeiles minor</i>	SHTN
Great potoo	<i>Nyctibius grandis</i>	GRPO
Common Potoo	<i>Nyctibius griseus</i>	CPOT
Black Swift	<i>Cypseloides niger</i>	BLSW
Spot-fronted Swift	<i>Cypseloides cherriei</i>	SFSW
Chestnut-collared Swift	<i>Streptoprocne rutila</i>	CCSW
White-collared Swift	<i>Streptoprocne zonaris</i>	WCSW
Costa Rican Swift	<i>Chaetura fumosa</i>	CRSW
Lesser Swallow-tailed Swift	<i>Panyptila cayennensis</i>	LASW
Stripe-throated Hermit	<i>Phaethornis striigularis</i>	SRTH
Long-billed Hermit	<i>Phaethornis longirostris</i>	LBIH
Bronzy Hermit	<i>Glaucis aenea</i>	BRHE
Band-tailed Barbthroat	<i>Threnetes ruckeri</i>	BTBA
White-tipped Sicklebill	<i>Eutoxeres aquila</i>	WTSI
Violet Sabrewing	<i>Campylopterus hemileucurus</i>	VISA
Scaly-breasted Hummingbird	<i>Phaeochroa cuvieri</i>	SBRH
Purple-crowned Fairy	<i>Heliothryx barroti</i>	PCFA
Charming Hummingbird	<i>Amazilia decora</i>	CHHU

White-necked Jacobin	<i>Florisuga mellivora</i>	WNJA
Garden Emerald	<i>Chlorostilbon assimilis</i>	GAEM
Violet-crowned Woodnymph	<i>Thalurania colombica</i>	VCWO
Blue-throated Goldentail	<i>Hylocharis eliciae</i>	BTRG
Rufous-tailed Hummingbird	<i>Amazilia tzactl</i>	RTAH
Veraguan Mango	<i>Anthracothorax veraguensis</i>	VEMA
Mangrove Hummingbird	<i>Amazilia boucardi</i>	MANH
Ruby-throated Hummingbird	<i>Archilochus colubris</i>	RTHU
Brown Violet-ear	<i>Colibri delphinae</i>	BRVI
Long-billed Starthroat	<i>Helioaster longirostris</i>	LBST
Green-fronted Lancebill	<i>Doryfera ludoviciae</i>	GFRL
Violet-headed Hummingbird	<i>Klais guimeti</i>	VHHU
White-crested Coquette	<i>Lophornis adorabilis</i>	WCCO
Black-headed Trogon	<i>Trogon melanocephalus</i>	BHTR
Gartered Trogon	<i>Trogon Caligatus</i>	GATR
Black-throated Trogon	<i>Trogon rufus</i>	BTHT
Baird's Trogon	<i>Trogon bairdii</i>	BATR
Orange-bellied Trogon	<i>Trogon aurantiiventris</i>	OBTR
Slaty-tailed Trogon	<i>Trogon massena</i>	STTR
Blue-crowned Motmot	<i>Momotus momota</i>	BCMO
Ringed Kingfisher	<i>Ceryle torquata</i>	RIKI
Green Kingfisher	<i>Chloroceryle americana</i>	GKIN
Belted Kingfisher	<i>Ceryle alcyon</i>	BEKI
American Pygmy Kingfisher	<i>Chloroceryle aenea</i>	APKI
Amazon Kingfisher	<i>Chloroceryle amazona</i>	AMKI
White-necked Puffbird	<i>Notharchus macrorhynchos</i>	WNPU
White-whiskered Puffbird	<i>Malacoptila panamensis</i>	WWPU
Rufous-tailed Jacamar	<i>Galbula ruficauda</i>	RTJA
Chestnut-mandibled Toucan	<i>Ramphastos swainsonii</i>	CMTO
Fiery-billed Araçari	<i>Pteroglossus frantzii</i>	FBAR
Golden-naped Woodpecker	<i>Melanerpes chrysauchen</i>	GNWO
Red-crowned Woodpecker	<i>Melanerpes rubricapillus</i>	RCRW
Rufous-winged Woodpecker	<i>Piculus simplex</i>	RCRW
Red-rumped Woodpecker	<i>Veniliornis kirkii</i>	RRWO
Olivaceous Piculet	<i>Picumnus olivaceus</i>	OLPI
Pale-billed Woodpecker	<i>Campephilus guatemalensis</i>	PBIW
Lineated Woodpecker	<i>Dryocopus lineatus</i>	LIWO
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>	YBSA
Pale-breasted Spinetail	<i>Synallaxis albescens</i>	PBSP
Slaty Spinetail	<i>Synallaxis brachyura</i>	SLSP
Striped Woodhaunter	<i>Hyloctistes subulatus</i>	STPW
Buff-throated Foliage-gleaner	<i>Automolus ochrolaemus</i>	BFFG
Scaly-throated Leaf Tosser	<i>Sclerurus guatemalensis</i>	STLE

Plain Xenops	<i>Xenops minutus</i>	PLXE
Northern Barred-Woodcreeper	<i>Dendrocolaptes sanctithomae</i>	NOBW
Ruddy Woodcreeper	<i>Dendrocincla homochroa</i>	RUWO
Tawny-winged Woodcreeper	<i>Dendrocincla anabatina</i>	TWWO
Long-tailed Woodcreeper	<i>Deconychura longicauda</i>	LTWO
Wedge-billed Woodcreeper	<i>Glyphorhynchus spirurus</i>	WBWO
Streak-headed Woodcreeper	<i>Lepidocolaptes souleyetii</i>	SHWO
Cocoa Woodcreeper	<i>Xiphorhynchus susurrans</i>	COWO
Black-striped Woodcreeper	<i>Xiphorhynchus lachrymosus</i>	BSWO
Spotted Woodcreeper	<i>Xiphorhynchus erythropygius</i>	SPWO
Strong-billed Woodcreeper	<i>Xiphocolaptes promeropirhynchus</i>	SNBW
Brown-billed Scythebill	<i>Campylorhamphus pusillus</i>	BBSC
Barred Antshrike	<i>Thamnophilus doliatus</i>	BAAN
Great Antshrike	<i>Taraba major</i>	GANT
Black-hooded Antshrike	<i>Thamnophilus bridgesi</i>	BHOA
Russet Antshrike	<i>Thamnistes anabatinus</i>	RUAN
Dusky Antbird	<i>Cercomacra tyrannina</i>	DUAN
Chestnut-backed Antbird	<i>Myrmeciza exsul</i>	CBAN
Bare-crowned Antbird	<i>Gymnocichla nudiceps</i>	BIAN
Bicolored Antbird	<i>Gymnopithys leucaspis</i>	BIAN
Plain Antwreio	<i>Dysithamnus mentalis</i>	PLAN
Slaty Antwren	<i>Myrmotherula schisticolor</i>	SLAN
Dot-winged Antwren	<i>Microrhopias quixensis</i>	DWAN
Streak-chested Antpitta	<i>Hylopezus perspicillatus</i>	SCHA
Black-faced Antthrush	<i>Formicarius analis</i>	BFAN
Yellow-bellied Tyrannulet	<i>Ornithion semiflavum</i>	YBTY
Yellow Tyrannulet	<i>Capsiempis flaveola</i>	YETY
Golden-crowned Spadebill	<i>Platyrinchus coronatus</i>	GCRS
Paltry Tyrannulet	<i>Zimmerius vilissimus</i>	PATY
Yellow-crowned Tyrannulet	<i>Tyrannulus elatus</i>	YCTY
Southern Beardless-Tyrannulet	<i>Camptostoma obsoletum</i>	SOBT
Yellow-bellied Eleania	<i>Elaenia flavogaster</i>	YBEL
Lesser Eleania	<i>Elaenia chiriquensis</i>	LEEL
Northern Scrub-Flycatcher	<i>Sublegatus arenarum</i>	NOSF
Piratic Flycatcher	<i>Legatus leucophaeus</i>	PIFL
Yellow-olive Flycatcher	<i>Tolmomyias sulphurescens</i>	YOFL
Greenish Eleania	<i>Myiopsis viridicata</i>	GREL
Common Tody-Flycatcher	<i>Todirostrum cinereum</i>	COTF
Slate-headed Tody-Flycatcher	<i>Poecilatriccus sylvia</i>	SHTF
Scale-crested Pygmy-Tyrant	<i>Lophotriccus pileatus</i>	SCPT
Northern Bentbill	<i>Oncostoma cinereigulare</i>	NOBE
Ruddy-tailed Flycatcher	<i>Terenotriccus erythrus</i>	RDTF
Ochre-bellied Flycatcher	<i>Mionectes oleagineus</i>	OBFL

Bran-colored Flycatcher	<i>Myiophobus fasciatus</i>	BCOF
Sulphur-rumped Flycatcher	<i>Myiobius sulphureipygius</i>	SRFL
Black-tailed Flycatcher	<i>Myiobius atricaudus</i>	BTFL
Bright-rumped Attila	<i>Attila spadiceus</i>	BRAT
Rufous Mourner	<i>Rhytipterna holerythra</i>	RMOU
Royal Flycatcher	<i>Onychorhynchus coronatus</i>	ROFL
Eye-ringed Flatbill	<i>Rhynchocyclus brevirostris</i>	ERFL
Olive-sided Flycatcher	<i>Contopus cooperi</i>	OSFL
Western Wood-Pewee	<i>Contopus sordidulus</i>	WEWP
Eastern Wood-Pewee	<i>Contopus virens</i>	EAWP
Tropical Pewee	<i>Contopus cinereus</i>	TRPE
Alder Flycatcher	<i>Empidonax alnorum</i>	ALFL
Willow Flycatcher	<i>Empidonax traillii</i>	WIFL
Acadian Flycatcher	<i>Empidonax Virescens</i>	ACFL
Yellow-bellied Flycatcher	<i>Empidonax flaviventris</i>	YBFL
Least Flycatcher	<i>Empidonax minimus</i>	LEFL
Fork-tailed Flycatcher	<i>Tyrannus savana</i>	FTFL
Scissor-tailed Flycatcher	<i>Tyrannus forficatus</i>	STFL
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	GCFL
Dusky-capped Flycatcher	<i>Myiarchus tuberculifer</i>	DCFL
Panama Flycatcher	<i>Myiarchus panamensis</i>	PAFL
Boat-billed Flycatcher	<i>Megarhynchus pitangua</i>	BOBF
Great Kiskadee	<i>Pitangus sulphuratus</i>	GKIS
Social Flycatcher	<i>Myiozetetes similis</i>	SOFL
Gray-capped Flycatcher	<i>Myiozetetes granadensis</i>	GCAF
Streaked Flycatcher	<i>Myiodynastes maculatus</i>	STRF
Sulphur-bellied Flycatcher	<i>Myiodynastes luteiventris</i>	SBFL
Tropical Kingbird	<i>Tyrannus melancholicus</i>	TRKI
Western Kingbird	<i>Tyrannus verticalis</i>	WEKI
Eastern Kingbird	<i>Tyrannus tyrannus</i>	EAKI
Rufous Piha	<i>Lipaugus unirufus</i>	RUFP
Thrushlike Schiffornis	<i>Schiffornis turdinus</i>	TLSC
Speckled Mourner	<i>Laniocera rufescens</i>	SPMO
Cinnamon Becard	<i>Pachyramphus cinnamomeus</i>	CIMB
Rose-throated Becard	<i>Pachyramphus aglaiae</i>	RTBE
White-winged Becard	<i>Pachyramphus polychopterus</i>	WWBE
Masked Tityra	<i>Tityra semifasciata</i>	MATI
Black-crowned Tityra	<i>Tityra inquisitor</i>	BCRT
Yellow-billed Cotinga	<i>Carpodectes antoniae</i>	YBCO
Turquoise Cotinga	<i>Cotinga ridgwayi</i>	TUCO
Three-wattled Bellbird	<i>Procnias tricarunculata</i>	TWBE
Orange-collared Manakin	<i>Manacus aurantiacus</i>	OCMA
White-ruffed Manakin	<i>Corapipo altera</i>	WRMA

Blue-crowned Manakin	<i>Pipra coronata</i>	BCRM
Red-capped Manakin	<i>Pipra mentalis</i>	RCMA
Yellow-throated Vireo	<i>Vireo flavifrons</i>	YTVI
Philadelphia Vireo	<i>Vireo philadelphicus</i>	PHVI
Yellow-green Vireo	<i>Vireo flavoviridis</i>	YGVI
Red-eyed Vireo	<i>Vireo olivaceus</i>	REVI
Scrub Greenlet	<i>Hylophilus flavipes</i>	SCRG
Tawny-crowned Greenlet	<i>Hylophilus ochraceiceps</i>	TCGR
Lesser Greenlet	<i>Hylophilus decurtatus</i>	LESG
Green Shrike-Vireo	<i>Vireolanius pulchellus</i>	GRSV
Mangrove Swallow	<i>Tachycineta albilinea</i>	MANS
Tree Swallow	<i>Tachycineta bicolor</i>	TRES
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	CLSW
Purple Martin	<i>Progne subis</i>	PUMA
Gray-breasted Martin	<i>Progne chalybea</i>	GYBM
Bank Swallow	<i>Riparia riaria</i>	BANS
Northern Rough-winged	<i>Stelgidopteryx serripennis</i>	NRWS
Southern Rough-winged	<i>Stelgidopteryx ruficollis</i>	SRWS
Barn Swallow	<i>Hirundo rustica</i>	BANS
Long-billed Gnatwren	<i>Ramphocaenus melanurus</i>	LBGN
Tropical Gnatcatcher	<i>Polioptila plumbea</i>	TRGN
Rufous-breasted Wren	<i>Thryothorus rutilus</i>	RBSW
Riverside Wren	<i>Thryothorus semibadius</i>	RIWR
Plain Wren	<i>Thryothorus modestus</i>	PLWR
Black-bellied Wren	<i>Thryothorus fasciatoventris</i>	BBEW
House Wren	<i>Troglodytes aedon</i>	HOWR
White-breasted Wood-Wren	<i>Henicorhina leucosticta</i>	WBWW
Scaly-breasted Wren	<i>Microcerculus marginatus</i>	SCBW
Swainson's Thrush	<i>Catharus ustulatus</i>	SWTH
Gray-cheeked Thrush	<i>Catharus minimus</i>	GCTH
Wood Thrush	<i>Hylocichla mustelina</i>	WOTH
White-throated Thrush	<i>Turdus assimilis</i>	WTTH
Clay-colored Thrush	<i>Turdus grayi</i>	CCTH
Gray Catbird	<i>Dumetella Carolinensis</i>	GRCA
Cedar Waxwing	<i>Bombycilla cedrorum</i>	CEDW
Tennessee Warbler	<i>Vermivora peregrina</i>	TEWA
Blue-winged Warbler	<i>Vermivora pinus</i>	BWWA
Golden-winged Warbler	<i>Vermivora chrysoptera</i>	GWWA
Northern Parula	<i>Parula americana</i>	NOPA
Tropical Parula	<i>Parula pitiayumi</i>	TRPA
Magnolia Warbler	<i>Dendroica magnolia</i>	MAWA
Yellow Warbler	<i>Dendroica petechia</i>	YWAR
Mangrove Warbler	<i>Dendroica petechia erithachorides</i>	MANW

Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>	CSWA
Blackburnian Warbler	<i>Dendroica fusca</i>	BLBW
Yellow-throated Warbler	<i>Dendroica dominica</i>	YTWA
Bay-breasted Warbler	<i>Dendroica Castan</i>	BBWA
Yellow-rumped Warbler	<i>Dendroica coronata</i>	YRWA
Cerulean Warbler	<i>Dendroica cerulea</i>	CERW
Black-and-white Warbler	<i>Mniotilta varia</i>	BAWW
American Redstart	<i>Setophaga ruticilla</i>	AMRE
Prothonotary Warbler	<i>Protonotaria citrea</i>	PROW
Ovenbird	<i>Seiurus aurocapilla</i>	OVEN
Worm-eating Warbler	<i>Helmitheros vermivorum</i>	WEWA
Northern Waterthrush	<i>Seiurus noveboracensis</i>	NOWA
Louisiana Waterthrush	<i>Seiurus motacilla</i>	LOWA
Wilson's Warbler	<i>Wilsonia pusilla</i>	WIWA
Hooded Warbler	<i>Wilsonia citrina</i>	HOWA
Canada Warbler	<i>Wilsonia canadensis</i>	CAWA
Mourning Warbler	<i>Oporornis philadelphia</i>	MOWA
Macgillivray's Warbler	<i>Oporornis tolmiei</i>	MGWA
Kentucky Warbler	<i>Oporornis formosus</i>	KEWA
Buff-rumped Warbler	<i>Phaeothlypis fulvicauda</i>	BURW
Gray-crowned Yellowthroat	<i>Geothlypis poliocephala</i>	GCYE
Common Yellowthroat	<i>Geothlypis trichas</i>	COYE
Yellow-breasted Chat	<i>Icteria virens</i>	YBCH
Bananaquit	<i>Coereba flaveola</i>	BANA
Black-cheeked Ant-Tanager	<i>Habia atrimaxillaris</i>	BCAT
White-shouldered Tanager	<i>Tachyphonus luctuosus</i>	WSTA
White-lined Tanager	<i>Tachyphonus rufus</i>	WLTA
Gray-headed Tanager	<i>Eucometis penicillata</i>	GHET
White-throated Shrike-Tanager	<i>Lanio leucothorax</i>	WTST
Western Tanager	<i>Piranga ludoviciana</i>	WETA
Summer Tanager	<i>Piranga rubra</i>	SUTA
Hepatic Tanager	<i>Piranga flava</i>	HETA
Scarlet Tanager	<i>Piranga olivacea</i>	SCTA
Cherrie's Tanager	<i>Ramphocelus costaricensis</i>	CHET
Speckled Tanager	<i>Tangara guttata</i>	SPTA
Golden-hooded Tanager	<i>Tangara larvata</i>	GHOT
Bay-headed Tanager	<i>Tangara gyrola</i>	BHTA
Silver-throated Tanager	<i>Tangara icterocephala</i>	STTA
Blue-gray Tanager	<i>Thraupis episcopus</i>	BGTA
Palm Tanager	<i>Thraupis palmarum</i>	PALT
Scarlet-thighed Dacnis	<i>Dacnis venusta</i>	STDA
Green Honeycreeper	<i>Chlorophanes spiza</i>	GRHO
Shining Honeycreeper	<i>Cyanerpes lucidus</i>	SHHO

Red-legged Honeycreeper	<i>Cyanerpes cyaneus</i>	RLHO
Blue Dacnis	<i>Dacnis cayana</i>	BLDA
Thick-billed Seed-Finch	<i>Oryzoborus funereus</i>	TBSF
Variable Seedeater	<i>Sporophila americana</i>	VASE
White-collared Seedeater	<i>Sporophila torqueola</i>	WCSE
Yellow-bellied Seedeater	<i>Sporophila nigricollis</i>	YBSE
Slate-colored Seedeater	<i>Sporophila schistacea</i>	SCSE
Ruddy-breasted Seedeater	<i>Sporophila minuta</i>	RBSE
Blue-black Grassquit	<i>Volatinia jacarina</i>	BGRA
Stripe-headed Brush Finch	<i>Buarremon torquatus</i>	SHBF
Orange-billed Sparrow	<i>Arremon aurantiirostris</i>	OBSP
Black-striped Sparrow	<i>Arremonops conirostris</i>	BSTS
House Sparrow	<i>Passer domesticus</i>	HOSP
Dickcissel	<i>Spiza americana</i>	DICK
Streaked Saltator	<i>Saltator striatipectus</i>	SSAL
Buff-throated Saltator	<i>Saltator maximus</i>	BTSA
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	RBGR
Blue-black Grosbeak	<i>Cyanocompsa cyanooides</i>	BGRO
Indigo Bunting	<i>Passerina cyanea</i>	INBU
Painted Bunting	<i>Passerina ciris</i>	PABU
Red-breasted Blackbird	<i>Sturnella militaris</i>	RBBL
Eastern Meadowlark	<i>Sturnella magna</i>	EAME
Melodios Blackbird	<i>Dives dives</i>	MEBL
Great-tailed Grackle	<i>Quiscalus mexicanus</i>	GTGR
Bronzed Cowbird	<i>Molothrus aeneus</i>	BROC
Giant Cowbird	<i>Molothrus oryzivorus</i>	GICO
Black-cowled Oriole	<i>Icterus prothemelas</i>	BCOR
Orchard Oriole	<i>Icterus spurius</i>	OROR
Baltimore Oriole	<i>Icterus galbula</i>	BAOR
Scarlet-rumped Cacique	<i>Cacicus uropygialis</i>	SRCA
Yellow-billed Cacique	<i>Amblycercus holosericeus</i>	YBIC
Elegant Euphonia	<i>Euphonia elegantissima</i>	ELEU
Thick-billed Euphonia	<i>Euphonia laniirostris</i>	TBEU
Yellow-throated Euphonia	<i>Euphonia hirundinacea</i>	YTEU
Yellow-crowned Euphonia	<i>Euphonia luteicapilla</i>	YCEU
White-vented Euphonia	<i>Euphonia minuta</i>	WVEU
Spot-crowned Euphonia	<i>Euphonia imitans</i>	SPCE

