

Results of Terrestrial Bird Studies on St. Martin: Winter of 2006

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Introduction

During the winter months of January and February 2006, Environmental Protection in the Caribbean (EPIC) banded passerines in two habitats on the Caribbean island of St. Martin. The two habitats were defined as secondary dry forest and thorn scrub forest. This was the fifth year banding in the secondary dry forest and third year banding in thorn scrub forest. Additionally, point count surveys were conducted in both habitats to detect birds which were not captured while banding.

There is little known regarding passerine overwintering requirements in the Lesser Antillean region of the Caribbean. Much has been studied on overwintering passerines in the Greater Antillean islands to the north of the Lesser Antilles, including the islands of Hispaniola, Puerto Rico, and Jamaica (Arendt and Faaborg 1989; Confer and Holmes 1993; Ewert and Askins 1991; Marra *et al.* 1993; Parrish and Sherry 1994; Wallace *et al.* 1996; Wunderle and Wade 1993). Habitat and diet requirements must be known in order to better conserve and protect the birds which overwinter in the Lesser Antilles.

Objectives

- Band both migrant birds and resident birds.
- Conduct area surveys for birds not accounted for while banding.
- Assess how many birds and which species of birds are using each habitat type: secondary dry forest and thorn scrub forest.
- For overwintering migrants: Assess length of stay in overwintering habitat.
- For overwintering migrants: Assess general health during overwintering period.
- For resident species: Assess general health over a two-month period as well as inter-annually.
- For resident species: Assess breeding cycles inter-annually.

Methods

Mist-netting: The objective of mist-netting was to collect information on the bird's age, sex, fat stores, molt, and plumage characteristics. Capture/re-capture analysis will give us additional insight into population estimates. Nets were placed within two separate habitats: secondary dry forest ("forest site") and thorn scrub forest ("scrub site"). Seventeen nets were used at both sites. Nets were arranged at a distance of three nets per two-hectare area. This distance assured biologists of covering all nets within a 15-minute time span. All nets used were six m or 12m long, 30mm mesh, 4-tier, tethered, nylon mist nets. Nets at the forest site were open from between 0600 and 1800 or less. Nets at the scrub site were open during morning hours, 0600-1200. Nets were placed in areas of high avian traffic. This assured us of high capture/re-capture rates. Finally, all birds were fitted with uniquely numbered leg bands. Banding dates were:

Banding Period	Secondary Dry Forest	Thorn Scrub Forest
Period One	1-5 January	7-11 January
Period Two	18-22 January	23-27 January
Period Three	2-5 February	6-8 February

Point Counts: Fixed radius point counts were run concurrently with mist-net sites during all banding periods. Surveys were done in two habitats on the island, secondary dry forest and thorn scrub forest. Each transect was done along pre-existing trails in each habitat. These trails were the only “breaks” in otherwise unbroken tracts of habitat, none of which border habitat edges.

Surveys started between 0600-0900 and ran for 70 minutes. Ten points were located along each transect. Points were located approximately 200 meters apart from each other, avoiding duplication of previously recorded birds, as more than 95% of individuals are detected within 125 meters of the observer (Ralph and Scott 1981). Five minutes were spent at each point. Data collected included all individuals seen or heard during the first three minutes and those individuals heard during the remaining two minutes. Counts only took place during stable weather conditions, not during rainy or exceptionally windy conditions. A single observer completed all surveys to reduce observer bias. During data collection, birds flying over the site were recorded separately from individuals detected in vegetation, as these birds may not have been associated with the habitat surrounding the station. A. Brown conducted all area surveys.

Results

We mist-netted for a total of 2914.5 net hours at both sites including 1678.5 hours at the forest site and 1236 at the scrub site.

We captured a combined total of 813 birds at both sites this year. We banded a combined total of 564 birds, recaptured 183 birds, and released 67 un-banded birds, including 157 migrants and 662 residents. We banded a total of 27 species including 12 species of overwintering migrants and 15 species of resident birds. During area searches of both study sites, we detected nine migrants and 15 resident species (Tables 1 and 2).

Secondary Dry Forest

The secondary dry forest site is located on Loterie Farm on the northeast side of St. Martin. The site is located at the 350 meter level on Pic Paradis. We banded at this site previously during the winters from 2002-2005.

We captured 328 birds of 17 species at the forest site this year, 204 birds banded, 72 recaptures, and 52 released un-banded. Of the 17 species captured, eight over-wintering migrant species (n=111) and nine resident species (n=191). The capture rate (birds/net hour) for migrant species was .066 while the capture rate for residents was .114 (Tables 5 and 6).

Our capture rate in this habitat (.195 birds/net hour) was below that of the thorn scrub site (.392). However, we captured more migrants in the forest habitat (n=130) (includes birds recaptured from previous years but not same year re-captures) than in the scrub site (n=27). Forty-percent of the new birds captured in the forest were overwintering migrants.

Within the forest site we trapped or observed four species not recorded within the scrub habitat: Black-throated Blue Warbler (*Dendroica caerulescens*), Chestnut-sided Warbler (*Dendroica pennsylvanica*), Black-throated Green Warbler (*Dendroica virens*), and Bridled Quail-dove (*Geotrygon mystacea*).

We had a capture rate of .195 new birds per net hour at the forest site in 2006. In direct comparison to the previous three years banding at this site: 0.45 (2002), 0.14 (2003), 0.16 (2004), 0.22 (2005). (Table 7)

We recaptured 43 birds of eight species of bird from previous years including four species of both resident (n=26) and migrant species (n=17) (tables 3 and 4).

During area searches of this site we recorded 16 species including 7 migrant species and 9 resident species (Table 10 and 11).

Thorn Scrub Forest

The thorn scrub forest site is located on the northwest slope of Pic Paradis within the private boundaries of Loterie Farm. The site is characterized by thorn acacia (*Acacia turtuosa*) and a low canopy (~ 3m). This was the third year banding at this site.

We captured a total of 485 birds of 23 species at this site, banding 360 birds, releasing 15 un-banded birds, and recapturing 111 birds. Of the 23 species banded, nine were overwintering migrants (n=27) and 14 were resident species (n=459). (Tables 1, 2, and 11)

Within the scrub site we observed/trapped ten species not observed at the forest site: Northern Waterthrush (*Seiurus noveboracensis*), Yellow Warbler (*Dendroica petechia petechia*), White-eyed Vireo (*Vireo griseus*), Prairie Warbler (*Dendroica discolor*), Common Ground Dove (*Columbina passerina*), Golden Yellow Warbler (*Dendroica petechia*), Bare-eyed Robin (*Turdus nudigenis*), Gray Kingbird (*Tyrannus dominicensis*), Green Heron (*Butorides virescens*), and Green-throated Carib (*Eulampis holosericeus*) (Table 12).

In direct comparison to 2003 and 2005, we observed a decrease for total new birds caught per net hour from .575 in 2003 and 397 in 2005 to .392 in 2006. The most common species banded were Northern Parula (*Parula americana*), Bananaquit (*Coereba flaveola*), Black-faced Grassquit (*Tiaris bicolor*), and Pearly-eyed Thrasher (*Margarops fuscatus*) (Tables 13 and 14).

We recaptured 53 birds of seven species from previous years, including one species of migrant (n=1) and six species of resident (n=52) (Tables 3 and 4).

During area searches of this site we recorded 18 species, including five migrant species and 13 resident species. The most common species recorded were Black-faced Grassquit and Bananaquit (Tables 15 and 16).

Discussion

Banding at two distinct habitat types during the winter of 2006 enabled us to further distinguish which habitats landbirds of St. Martin require during the winter months. We were able to identify species which rely on a single habitat type during their overwintering stay on St. Martin. Additionally, we were able to identify habitats where the majority of certain overwintering species are located. Finally, we were able to monitor populations of resident species in multiple habitats.

The secondary dry forest is critically important habitat for migrant landbirds on St. Martin. Within this habitat, we recorded nearly 85% of all migrant landbirds banded on St. Martin. Eight of the 12 overwintering species observed/banded on St. Martin in 2006 were banded in the forest site.

Thorn scrub is critical habitat for resident species on the island. We recorded high counts for 12 of the 15 resident species. Of the 15 resident species banded overall, six of those species were only found within the scrub habitat.

Both habitats share common threats: habitat loss due to development, hunting by humans, and mongoose predation. Secondary dry forest habitat is rapidly decreasing as developments encroach up the forested

hillsides of the island. Predation by mongoose on landbirds is a serious threat (Seaman and Randall 1962). We witnessed mongoose predation on landbirds in our mist nets on multiple occasions. Mongoose have been commonly observed in both habitats on the island. Many of these threats can be controlled by proper management and development of the island.

Careful consideration of habitat and species loss due to development should be a major consideration of developers and governments. Hunting on St. Martin should be regulated and bans should be put placed on taking threatened and endangered resident species and all migrant species. These hunting bans should be enforced by land management officers. Control of the mongoose problem should be taken up. Trapping and removal of this invasive species should become a priority for both public and private land managers. St. Martin is an important area for migrating and overwintering birds. The habitats of the island should be protected for both the use of these birds as well as the use of resident birds on St. Martin.

Priority Recommendations

- Pass legislation protecting areas of high bird diversity from development, including hillside slopes above 200 meters and all wetland areas, including ponds, lagoons, and coastal intertidal zones.
- Enact a permit system where all new developments are required to uphold stringent environmental laws, including limiting vegetation removal (i.e. stands of large trees or mangrove forests) and filling wetland areas with debris.
- Enact legislation protecting all non-invasive landbird species from hunting, including both resident and migratory species

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Tables

Table 1. Migrant bird totals for new birds trapped (non-recaptures) for both banding sites during winter 2006 on St. Martin

Migrant Birds		
	forest	scrub
Northern Waterthrush	0	2
Hooded Warbler	4	1
White-eyed Vireo	0	1
Black-and-white Warbler	32	1
Ovenbird	4	2
Northern Parula	9	6
American Redstart	59	2
Yellow Warbler	0	1
Prairie Warbler	0	2
Black-throated Blue Warbler	1	0
Chestnut-sided Warbler	1	0
Black-throated Green Warbler	1	0

Table 2. Resident bird totals for new birds trapped (non-recaptures) for both banding sites during winter 2006 on St. Martin.

Resident Birds		
	forest	scrub
Bananaquit	100	196
Black-faced Grassquit	9	93
Lesser Antillean Bullfinch	11	29
Antillean-crested Hummingbird	44	5
Pearly-eyed Thrasher	17	30
Scaly-breasted Thrasher	2	3
Caribbean Eleania	5	19

Zenaida Dove	2	2
Bridled Quail-dove	1	0
Common Ground-dove	0	7
Golden-yellow Warbler	0	16
Bare-eyed Robin	0	1
Gray Kingbird	0	3
Green Heron	0	1
Green-throated Carib	0	1

Table 3. 2006 migrant recapture histories by year originally banded, species, and number recaptured.

Migrants	Forest Site					Scrub Site		
	2002	2003	2004	2005	2006	2003	2005	2006
Black-and-white Warbler	0	1	0	0	11	0	0	0
Northern Parula	0	0	0	0	1	0	0	1
American Redstart	1	2	2	11	5	0	0	1
Hooded Warbler	0	0	0	0	2	0	0	0
Northern Waterthrush	0	0	0	0	0	0	0	1
White-eyed Vireo	0	0	0	0	0	0	0	1
Prairie Warbler	0	0	0	0	0	1	0	0

Table 4. 2006 resident recapture histories by year originally banded, species, and number recaptured.

Residents	Forest Site					Scrub Site				
	2002	2003	2004	2005	2006	2002	2003	2004	2005	2006
Bananaquit	4	5	5	6	11	6	7	0	13	36
Black-faced Grassquit	0	1	0	0	11	0	4	0	8	8
Lesser Antillean Bullfinch	0	0	0	1	3	0	0	1	2	3
Pearly-eyed Thrasher	2	0	1	1	1	0	4	0	5	3
Zenaida Dove	0	0	0	0	0	0	0	0	0	0
Common Ground Dove	0	0	0	0	0	0	0	0	1	1
Golden Yellow Warbler	0	0	0	0	0	0	0	0	1	1
Caribbean Eleania	0	0	0	0	0	0	0	0	0	2

Table 5. Comparison of total new migrant birds trapped in the secondary dry forest during 2002-2006.

Migrant Birds					
	2002	2003	2004	2005	2006
Yellow-throated Vireo	0	0	1	0	0
Blue-winged Warbler	0	0	0	2	0
Northern Parula	0	0	0	14	9
Chestnut-sided Warbler	1	0	1	1	1
Magnolia Warbler	0	1	2	0	0
Black-throated Green Warbler	0	0	0	0	1
Black-throated Blue Warbler	2	3	7	15	1
Prairie Warbler	0	0	0	0	0
Kentucky Warbler	0	0	0	2	0

Black-and-white Warbler	1	9	10	17	32
American Redstart	23	16	14	53	59
Worm-eating Warbler	0	0	0	2	0
Ovenbird	1	2	5	1	4
Louisiana Waterthrush	1	0	0	0	0
Hooded Warbler	7	5	3	7	4
Rose-breasted Grosbeak	0	0	0	1	0
Indigo Bunting	0	0	8	0	0

Table 6. Comparison of total new resident birds trapped in the secondary dry forest during 2002-2006.

Resident Birds					
	2002	2003	2004	2005	2006
Zenaida Dove	2	1	6	0	2
Common Ground Dove	2	0	0	0	0
Caribbean Eleania	0	2	1	2	5
Scaly-breasted Thrasher	5	10	11	3	2
Pearly-eyed Thrasher	16	6	28	14	17
Antillean-crested Hummingbird	3	4	6	8	44
Bananaquit	112	51	64	64	100
Black-faced Grassquit	23	5	21	3	9
Lesser Antillean Bullfinch	12	8	6	9	11
Bridled Quail-dove	0	0	0	0	1

Table 7. Comparison of new migrant birds trapped per net hour in the secondary dry forest from 2002-2006.

Species	2002	2003	2004	2005	2006
Yellow-throated Vireo	0	0	0.001	0	0
Blue-winged Warbler	0	0	0	0.002	0
Northern Parula	0.008	0.006	0.004	0.014	0.005
Chestnut-sided Warbler	0.002	0	0.001	0.004	0.001
Magnolia Warbler	0	0.001	0.002	0	0
Black-throated Blue Warbler	0.004	0.003	0.006	0.015	0.001
Black-throated Green Warbler	0	0	0	0	0.001
Prairie Warbler	0.006	0.001	0	0	0
Kentucky Warbler	0	0.003	0.001	0.002	0
Black-and-white Warbler	0.002	0.009	0.008	0.017	0.019
American Redstart	0.048	0.017	0.011	0.053	0.035
Worm-eating Warbler	0	0	0	0.002	0
Ovenbird	0.002	0.002	0.004	0.001	0.002
Louisiana Waterthrush	0.002	0	0	0	0
Hooded Warbler	0.015	0.005	0.002	0.007	0.002
Rose-breasted Grosbeak	0	0	0	0.001	0
Indigo Bunting	0	0	0.006	0	0

Table 8. Comparison of new resident birds trapped per net hour in the secondary dry forest from 2002-2006.

Species	2002	2003	2004	2005	2006
Zenaida Dove	0.004	0.001	0.005	0	0.001
Common Ground Dove	0.004	0	0	0	0.000
Bridled Quail-dove	0	0	0	0	0.001
Caribbean Eleania	0	0.002	0.001	0.002	0.003
Scaly-breasted Thrasher	0.01	0.01	0.009	0.003	0.001
Pearly-eyed Thrasher	0.033	0.006	0.022	0.014	0.010
Antillean-crested Hummingbird	0.006	0.004	0.005	0.008	0.026
Bananaquit	0.233	0.053	0.051	0.065	0.060
Black-faced Grassquit	0.048	0.005	0.017	0.003	0.005
Lesser Antillean Bullfinch	0.025	0.008	0.005	0.009	0.007

Table 9. Comparison of high counts for migrant species encountered during area surveys of secondary dry forest site from the winters of 2003-2006.

Migrant Species	Migrant Species			
	2003	2004	2005	2006
Baltimore Oriole	0	1	0	0
Yellow-billed Cuckoo	1	1	1	0
Chuck-will's Widow	1	0	0	0
Yellow-bellied Sapsucker	0	0	1	0
Yellow-throated Vireo	0	1	1	1
Blue-winged Warbler	0	0	2	0
Northern Parula	6	5	8	5
Chestnut-sided Warbler	0	1	1	0
Magnolia Warbler	1	3	2	0
Black-throated Blue Warbler	6	7	12	1
Black-throated Green Warbler	0	0	0	2
Myrtle Warbler	1	0	0	0
Prairie Warbler	3	3	0	0
Canada Warbler	0	1	0	0
Black-and-white Warbler	6	12	16	2
American Redstart	18	24	40	26
Worm-eating Warbler	1	1	2	0
Ovenbird	1	5	2	0
Hooded Warbler	2	5	6	2
Kentucky Warbler	1	1	2	0
Scarlet Tanager	0	0	1	0
Rose-breasted Grosbeak	0	0	1	0
Indigo Bunting	0	12	1	0

Table 10. Comparisons of high counts for resident species encountered during area surveys of secondary dry forest site from the winters of 2002-2006.

Resident Species				
	2003	2004	2005	2006
Osprey	1	0	0	0
American Kestrel	2	2	2	0
Zenaida Dove	2	6	8	0
Common Ground Dove	0	3	6	0
Green-throated Carib	1	1	2	1
Antillean Crested Hummingbird	1	4	9	3
Caribbean Elaenia	5	3	2	6
Gray Kingbird	3	2	3	6
Scaly-breasted Thrasher	12	11	7	4
Pearly-eyed Thrasher	23	31	21	8
Golden Yellow Warbler	0	2	0	0
Bananaquit	22	18	37	14
Black-faced Grassquit	7	9	4	3
Lesser Antillean Bullfinch	4	6	12	5

Table 11. Comparison of total new migrant birds trapped in the thorn scrub forest during 2003, 2005, and 2006.

Migrant Species			
	2003	2005	2006
Merlin	1	0	0
Northern Parula	4	4	6
Prairie Warbler	5	1	2
Black-and-white-Warbler	0	1	1
Ovenbird	0	3	2
Hooded Warbler	3	1	1
Indigo Bunting	1	2	0
Northern Waterthrush	0	0	2
White-eyed Vireo	0	0	1
American Redstart	0	0	2
Yellow Warbler	0	0	1

Table 12. Comparison of total new resident birds trapped in the thorn scrub forest during 2003, 2005, and 2006.

Resident Birds			
	2003	2005	2006
Cattle Egret	0	1	0
Green Heron	0	1	1
Zenaida Dove	4	3	2
Common Ground Dove	9	2	7
Mangrove Cuckoo	1	0	0
Green-throated Carib	4	3	1
Antillean Crested Hummingbird	0	0	5
Caribbean Eleania	12	2	19
Gray Kingbird	0	0	3

Bare-eyed Robin	0	0	1
Scaly-breasted Thrasher	2	0	3
Pearly-eyed Thrasher	22	9	30
Black-whiskered Vireo	3	0	0
Golden Yellow Warbler	8	3	16
Bananaquit	331	92	196
Black-faced Grassquit	93	20	93
Lesser Antillean Bullfinch	15	4	29

Table 13. Comparison of new migrant birds trapped per net hour in the thorn scrub forest from 2003, 2005, and 2006.

Species	2003	2005	2006
Merlin	0.001	0	0
Northern Parula	0.004	0.01	0.005
Prairie Warbler	0.006	0.003	0.002
Black-and-white-Warbler	0	0.003	0.001
Ovenbird	0	0.008	0.002
Northern Waterthrush	0	0	0.002
American Redstart	0	0	0.002
Hooded Warbler	0.003	0.003	0.001
Yellow Warbler	0	0	0.001
White-eyed Vireo	0	0	0.001
Indigo Bunting	0.001	0.005	0

Table 14. Comparison of new resident birds trapped per net hour in the thorn scrub forest from 2003, 2005, and 2006.

Species	2003	2005	2006
Cattle Egret	0	0.003	0
Green Heron	0	0.003	0.001
Zenaida Dove	0.004	0.008	0.002
Common Ground Dove	0.01	0.005	0.006
Mangrove Cuckoo	0.001	0	0
Green-throated Carib	0.004	0.008	0.001
Antillean Crested Hummingbird	0	0.004045	0.004
Caribbean Eleania	0.013	0.005	0.015
Gray Kingbird	0	0	0.002
Bare-eyed Robin	0	0	0.001
Scaly-breasted Thrasher	0.002	0	0.002
Pearly-eyed Thrasher	0.024	0.024	0.024
Black-whiskered Vireo	0.003	0	0
Golden Yellow Warbler	0.009	0.008	0.013
Bananaquit	0.368	0.241	0.159
Black-faced Grassquit	0.103	0.052	0.075
Lesser Antillean Bullfinch	0.017	0.01	0.023

Table 15. Comparison of high counts for migrant species encountered during area surveys of thorn scrub forest site from the winters of 2003, 2005, and 2006.

Migrant Species			
	2003	2005	2006
Wilson's Snipe	0	0	1
Sora	0	0	1
Merlin	0	1	0
Yellow-billed Cuckoo	2	0	0
White-eyed Vireo	0	1	1
Northern Parula	4	5	1
Prairie Warbler	3	3	1
American Redstart	2	8	0
Ovenbird	0	3	0
Hooded Warbler	0	1	0
Common Yellowthroat	1	0	0
Indigo Bunting	0	2	0

Table 16. Comparisons of high counts for resident species encountered during area surveys of thorn scrub forest site from the winters of 2003, 2005, and 2006.

Resident Species			
	2003	2005	2006
Cattle Egret	0	0	11
Green Heron	0	0	1
Osprey	1	0	0
American Kestrel	0	2	3
Zenaida Dove	1	2	8
Common Ground Dove	1	1	0
Mangrove Cuckoo	1	3	3
Green-throated Carib	0	1	0
Antillean-crested Hummingbird	0	0	2
Caribbean Elaenia	3	1	11
Gray Kingbird	0	3	12
Scaly-breasted Thrasher	1	0	0
Pearly-eyed Thrasher	22	9	3
Black-whiskered Vireo	1	1	0
Golden Yellow Warbler	8	10	9
Bananaquit	46	21	38
Black-faced Grassquit	14	8	43
Lesser Antillean Bullfinch	0	3	7