

Results of Terrestrial Bird Studies on St. Martin: Winter of 2008

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Introduction

During the winter months of January-March 2008, Environmental Protection in the Caribbean (EPIC) banded passerines in two habitats on the Caribbean island of St. Martin. The habitats were defined as secondary dry forest and mangrove forest. This was the seventh year banding in the secondary dry forest and fourth year banding in the mangrove forest. Additionally, point count surveys were conducted in all 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 over-winter 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 mangrove 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 three-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 secondary dry forest ("forest site") and mangrove forest ("mangrove site"). Seven nets were used at the forest and ten nets were used at the mangrove site. 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 6m or 12m long, 30mm mesh, 4-tier, tethered, nylon mist nets. Nets at the forest site were open from between 1300 and 1500. Nets at the mangrove site were open during morning hours, 0600-1000. 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; Mangrove Forest

Period One: 2-4 January; 6-8 January

Period Two: 6-8 March; 9-11 March

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 mangrove 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 in the secondary dry forest started at 1300 and surveys in the mangrove forest started at 0700. All point count surveys 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. 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.

Results

We mist-netted for a total of 341.5 net hours, including 101.5 hours at the forest site and 240 hours at the mangrove site. Net hours are defined as total hours banded times total nets open during those hours (i.e. three mist nets open for three hours each is nine net hours). We captured a total of 598 birds at all sites combined this year including 98 migrants and 500 residents. We banded 344 birds, recaptured 231 birds, and released 21 un-banded birds. We banded a total of 18 species including 7 species of overwintering migrants and 11 species of resident birds (Tables 1 and 2). During point counts within all study sites, we detected 30 species, including 10 migrant and 20 resident species.

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 2002-2007.

We captured 126 birds of 8 species at the forest site this year, 74 birds banded, 38 recaptures, and 14 released un-banded. Of the 8 species captured, there were four over-wintering migrant species (n=89) and four resident species (n=37). The capture rate (birds/net hour) for migrant species was .877 while

the capture rate for residents was .365. (Tables 7 and 8) Our capture rate in this habitat (.1.243 birds/net hour) was below that of the mangrove site (1.916). However, we captured more migrants in the forest habitat (n=89) than in the mangrove site (n=8). Seventy-one percent of the new birds captured in the forest were overwintering migrants. We had a capture rate of 1.153 new birds per net hour at the forest site in 2008 (includes birds recaptured from previous years but not same year recaptures). This rate is substantially higher than the seven-year mean for the forest site.

We recaptured 33 birds of 5 species from previous years including two resident species (n=7) and three migrant species (n=26) (Tables 3 and 4). During area searches of this site we recorded 20 species including 8 migrant species and 12 resident species (Tables 9 and 10).

Mangrove Forest

The mangrove scrub forest site is located in the Etang aux Poisson and along its margins in eastern St. Martin. Primary vegetation within this area consisted of red mangroves, black mangrove, white mangrove, buttonwood, and sea grape. Previously, we banded at this site during 2003, 2004, and 2007. We captured a total of 463 birds of 13 species at this site, banding 261 birds, recapturing 195 birds, and releasing 7 un-banded birds. Of the 13 species banded, three were overwintering migrants (n=8) and 10 were resident species (n=452). (Tables 1 and 2) We had a capture rate of 1.916 birds per net hour at the mangrove site in 2008. This rate is substantially higher than in 2003 and 2004 and very similar to the capture rate in 2007 (2007=1.918) (Tables 13 and 14). Capture rates for resident species were 1.883, while capture rates for migrant species were .046. Ninety-eight percent of the birds captured in the mangroves were resident species.

We recaptured 100 birds of seven species from previous years. There were six resident species recaptured from previous years (n=99). A Northern Waterthrush was the only migrant species captured from a previous year. (Table 11) During area searches of this site we recorded 15 species, including four migrant species and 11 resident species. (Tables 15 and 16)

Discussion

Banding at two habitat types during the winter of 2008 enabled us to further distinguish which habitats land birds 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 92% of all migrant landbirds banded on St. Martin. Eight of the 12 overwintering species observed/banded on St. Martin in 2008 were banded in the forest site.

Mangrove is critical habitat for resident species on the island as well as for particular migrant species. We recorded high counts for 9 of the 11 resident species banded. Additionally, within this habitat we banded the only Northern Waterthrushes, a migrant species, on the island.

All 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 2008 on St. Martin

	Forest	Mangrove
Spotted Sandpiper	0	1
Northern Waterthrush	0	6
Black-and-white Warbler	17	0
Northern Parula	17	0
American Redstart	46	0
Prairie Warbler	0	2
Black-throated Blue Warbler	2	0

Table 2. Resident bird totals for new birds trapped (non-recaptures) for both banding sites during winter 2008 on St. Martin.

	Forest	Mangrove
Bananaquit	12	293
Black-faced Grassquit	13	30
Lesser Antillean Bullfinch	1	37
Antillean-crested Hummingbird	9	0
Green-throated Carib	0	2
Caribbean Eleania	0	29
Gray Kingbird	0	2
Zenaida Dove	0	3
White-winged Dove	0	1
Common Ground Dove	0	23

Golden-yellow Warbler	0	28
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Table 3. 2008 migrant recapture histories by year originally banded, species, and number recaptured.

	Forest Site						Mangrove Site		
	2003	2004	2005	2006	2007		2003	2004	2007
Black-and-white Warbler	0	0	1	1	2		0	0	0
Northern Parula	0	0	0	0	1		0	0	0
American Redstart	1	0	3	6	11		0	0	0
Northern Waterthrush	0	0	0	0	0		0	0	1

Table 4. 2008 resident recapture histories by year originally banded, species, and number recaptured.

	Forest Site							Mangrove Site		
	2002	2003	2004	2005	2006	2007		2003	2004	2007
Bananaquit	1					2		3	10	56
Black-faced Grassquit						4		2		2
Lesser Antillean Bullfinch										4
Pearly-eyed Thrasher										
Zenaida Dove										
Common Ground Dove										1
Golden Yellow Warbler									1	7
Caribbean Eleania								3	1	9

Table 5. Comparison of total new migrant birds trapped in the secondary dry forest during 2002-2008.

	2002	2003	2004	2005	2006	2007	2008
Yellow-throated Vireo	0	0	1	0	0	0	0
Blue-winged Warbler	0	0	0	2	0	0	0
Northern Parula	0	0	0	14	9	22	18
Chestnut-sided Warbler	1	0	1	1	1	0	0
Magnolia Warbler	0	1	2	0	0	0	0
Black-throated Green Warbler	0	0	0	0	1	0	0
Black-throated Blue Warbler	2	3	7	15	1	10	2
Prairie Warbler	0	0	0	0	0	0	0
Kentucky Warbler	0	0	0	2	0	3	0
Black-and-white Warbler	1	9	10	17	32	44	17
American Redstart	23	16	14	53	59	115	46
Worm-eating Warbler	0	0	0	2	0	1	0
Ovenbird	1	2	5	1	4	2	0
Louisiana Waterthrush	1	0	0	0	0	0	0
Hooded Warbler	7	5	3	7	4	7	0

Rose-breasted Grosbeak	0	0	0	1	0	0	0
Indigo Bunting	0	0	8	0	0	0	0

Table 6. Comparison of total new resident birds trapped in the secondary dry forest during 2002-2008.

	2002	2003	2004	2005	2006	2007	2008
Zenaida Dove	2	1	6	0	2	2	0
Common Ground Dove	2	0	0	0	0	1	0
Caribbean Eleania	0	2	1	2	5	10	0
Scaly-breasted Thrasher	5	10	11	3	2	2	0
Pearly-eyed Thrasher	16	6	28	14	17	11	0
Antillean-crested Hummingbird	3	4	6	8	44	43	9
Bananaquit	112	51	64	64	100	162	12
Black-faced Grassquit	23	5	21	3	9	30	13
Lesser Antillean Bullfinch	12	8	6	9	11	22	1
Bridled Quail-dove	0	0	0	0	1	0	0

Table 7. Comparison of new migrant birds trapped per net hour in the secondary dry forest from 2002-2008.

	2002	2003	2004	2005	2006	2007	2008
Yellow-throated Vireo	0	0	0.001	0	0	0	0
Blue-winged Warbler	0	0	0	0.002	0	0	0
Northern Parula	0.008	0.006	0.004	0.014	0.005	0.018	0.177
Chestnut-sided Warbler	0.002	0	0.001	0.004	0.001	0	0
Magnolia Warbler	0	0.001	0.002	0	0	0	0
Black-throated Blue Warbler	0.004	0.003	0.006	0.015	0.001	0.008	0
Black-throated Green Warbler	0	0	0	0	0.001	0	0.020
Prairie Warbler	0.006	0.001	0	0	0	0	0
Kentucky Warbler	0	0.003	0.001	0.002	0	0.002	0
Black-and-white Warbler	0.002	0.009	0.008	0.017	0.019	0.036	0.167
American Redstart	0.048	0.017	0.011	0.053	0.035	0.093	0.453
Worm-eating Warbler	0	0	0	0.002	0	0.001	0
Ovenbird	0.002	0.002	0.004	0.001	0.002	0.002	0
Louisiana Waterthrush	0.002	0	0	0	0	0	0
Hooded Warbler	0.015	0.005	0.002	0.007	0.002	0.006	0
Rose-breasted Grosbeak	0	0	0	0.001	0	0	0
Indigo Bunting	0	0	0.006	0	0	0	0

Table 8. Comparison of new resident birds trapped per net hour in the secondary dry forest from 2002-2008.

	2002	2003	2004	2005	2006	2007	2008
Zenaida Dove	0.004	0.001	0.005	0	0.001	0.002	0
Common Ground Dove	0.004	0	0	0	0.000	0.001	0
Bridled Quail-dove	0	0	0	0	0.001	0	0
Caribbean Eleania	0	0.002	0.001	0.002	0.003	0.008	0
Scaly-breasted Thrasher	0.01	0.01	0.009	0.003	0.001	0.002	0
Pearly-eyed Thrasher	0.033	0.006	0.022	0.014	0.010	0.009	0.089
Antillean-crested Hummingbird	0.006	0.004	0.005	0.008	0.026	0.035	0.118
Bananaquit	0.233	0.053	0.051	0.065	0.060	0.131	0.128
Black-faced Grassquit	0.048	0.005	0.017	0.003	0.005	0.024	0.010
Lesser Antillean Bullfinch	0.025	0.008	0.005	0.009	0.007	0.018	0

Table 9. Comparison of high counts for migrant species encountered during area surveys of secondary dry forest site from the winters of 2003-2008.

	2003	2004	2005	2006	2007	2008
Baltimore Oriole	0	1	0	0	0	0
Yellow-billed Cuckoo	1	1	1	0	0	0
Chuck-will's Widow	1	0	0	0	0	0
Yellow-bellied Sapsucker	0	0	1	0	0	0
Yellow-throated Vireo	0	1	1	1	2	2
Blue-winged Warbler	0	0	2	0	0	1
Northern Parula	6	5	8	5	17	22
Chestnut-sided Warbler	0	1	1	0	0	0
Magnolia Warbler	1	3	2	0	1	0
Black-throated Blue Warbler	6	7	12	1	4	4
Black-throated Green Warbler	0	0	0	2	0	0
Myrtle Warbler	1	0	0	0	0	0
Prairie Warbler	3	3	0	0	2	1
Canada Warbler	0	1	0	0	0	0
Black-and-white Warbler	6	12	16	2	10	17
American Redstart	18	24	40	26	31	31
Worm-eating Warbler	1	1	2	0	1	0
Ovenbird	1	5	2	0	1	0
Hooded Warbler	2	5	6	2	6	3
Kentucky Warbler	1	1	2	0	1	0
Scarlet Tanager	0	0	1	0	0	0
Rose-breasted Grosbeak	0	0	1	0	0	0

Indigo Bunting	0	12	1	0	1	0
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Table 10. Comparisons of high counts for resident species encountered during area surveys of secondary dry forest site from the winters of 2002-2008.

	2003	2004	2005	2006	2007	2008
Osprey	1	0	0	0	0	0
Green Heron	0	0	0	0	3	0
American Kestrel	2	2	2	0	3	2
Zenaida Dove	2	6	8	0	13	2
Bridled Quail Dove	0	0	0	0	2	1
Scaly-naped Pigeon	0	0	0	0	4	3
Common Ground Dove	0	3	6	0	3	0
Green-throated Carib	1	1	2	1	2	0
Antillean Crested Hummingbird	1	4	9	3	8	7
Mangrove Cuckoo	0	0	0	0	3	0
Caribbean Elaenia	5	3	2	6	13	2
Gray Kingbird	3	2	3	6	5	0
Scaly-breasted Thrasher	12	11	7	4	9	4
Pearly-eyed Thrasher	23	31	21	8	20	19
Black-whiskered Vireo	0	0	0	0	2	1
Golden Yellow Warbler	0	2	0	0	0	0
Bananaquit	22	18	37	14	44	21
Black-faced Grassquit	7	9	4	3	22	14
Lesser Antillean Bullfinch	4	6	12	5	10	8

Table 11. Comparison of total new migrant birds trapped in the mangrove forest from 2003-2008.

	2003	2004	2007	2008
Lesser Yellowlegs	0	1	0	0
Spotted Sandpiper	0	2	0	1
Least Sandpiper	0	1	0	0
Semipalmated Sandpiper	0	2	0	0
Prothonotary Warbler	3	0	0	0
Northern Waterthrush	9	3	5	6
Prairie Warbler	3	1	2	2
Myrtle Warbler	1	0	0	0
Cape May Warbler	0	0	1	0

Table 12. Comparison of total new resident birds trapped in the mangrove forest from 2003-2008.

	2003	2004	2007	2008
Green Heron	0	2	0	0
White-winged Dove	0	0	2	1
Zenaida Dove	0	0	3	3
Common Ground Dove	20	23	12	18
Mangrove Cuckoo	0	0	2	0
Gray Kingbird	8	1	3	2
Caribbean Eleania	14	7	13	23
Pearly-eyed Thrasher	0	1	0	0
Green-throated Carib	0	2	0	2
Belted Kingfisher	1	2	0	0
Golden Yellow Warbler	23	39	25	21
Bananaquit	90	126	320	239
Black-faced Grassquit	21	18	24	21
Lesser Antillean Bullfinch	3	0	22	25

Table 13. Comparison of new migrant birds trapped per net hour in the mangrove forest from 2003-2008

	2003	2004	2007	2008
Lesser Yellowlegs	0	0.001	0	0
Spotted Sandpiper	0	0.003	0	0.004
Least Sandpiper	0	0.001	0	0
Semipalmated Sandpiper	0	0.003	0	0
Prothonotary Warbler	0.004	0.001	0	0
Northern Waterthrush	0.012	0.006	0.015	0.025
Prairie Warbler	0.004	0.001	0.006	0.008
Myrtle Warbler	0.001	0	0	0
Cape May Warbler	0	0	0.003	0

Table 14. Comparison of new resident birds trapped per net hour in the mangrove forest from 2003-2008.

	2003	2004	2007	2008
Green Heron	0	0.003	0	0
White-winged Dove	0	0	0.006	0.004
Zenaida Dove	0	0	0.009	0.013
Common Ground Dove	0.027	0.032	0.035	0.075
Mangrove Cuckoo	0	0	0.006	0
Gray Kingbird	0.011	0.001	0.009	0.008
Caribbean Eleania	0.019	0.01	0.038	0.096
Pearly-eyed Thrasher	0	0.001	0	0
Green-throated Carib	0	0.003	0	0.008
Belted Kingfisher	0.001	0.003	0	0
Golden Yellow Warbler	0.031	0.055	0.074	0.088
Bananaquit	0.12	0.177	0.941	0.996
Black-faced Grassquit	0.028	0.025	0.071	0.088
Lesser Antillean Bullfinch	0.004	0	0.065	0.104

Table 15. Comparison of high counts for migrant species encountered during area surveys of mangrove forest site from 2003-2008.

	2003	2004	2007	2008
Osprey	0	0	1	0
Peregrine Falcon	0	0	0	0
Belted Kingfisher	3	1	2	2
Cliff Swallow	0	0	2	9
Myrtle Warbler	4	0	0	0
Prairie Warbler	2	1	1	1
Prothonotary Warbler	1	1	0	0
Northern Waterthrush	5	7	4	5

Table 16. Comparisons of high counts for resident species encountered during area surveys of mangrove forest site from 2003-2008.

	2003	2004	2007	2008
Green Heron	0	0	1	0
American Kestrel	0	0	1	0
White-winged Dove	0	0	8	7
Common Ground Dove	8	5	6	3
Zenaida Dove	0	2	1	0
Caribbean Martin	0	0	0	6
Mangrove Cuckoo	0	0	7	3
Green-throated Carib	0	0	2	2
Caribbean Elaenia	4	7	16	15
Gray Kingbird	5	6	9	10
Black-whiskered Vireo	2	0	0	0
Golden Yellow Warbler	28	41	25	14
Bananaquit	52	43	58	43
Black-faced Grassquit	11	5	9	18
Lesser Antillean Bullfinch	5	0	9	2