



## Avian Influenza Monitoring in the Caribbean



**Principle Investigator:** Adam C. Brown; Director of Wetlands Program Environmental Protection in the Caribbean (EPIC). 200 Dr. MLK Jr. Blvd Riviera Beach, FL 33404. [abrown@epicislands.org](mailto:abrown@epicislands.org) and [www.epicislands.org](http://www.epicislands.org)

**Caribbean Avian Influenza Monitoring:**  
**Final Technical Report (1 July 2007 – 10 May 2008)**

**Awardee: Environmental Protection in the Caribbean (EPIC)**

**Adam C. Brown, Vice-President. Environmental Protection in the Caribbean (EPIC); 200 Dr. MLK Jr. Blvd., Riviera Beach, Florida 33404, USA. [abrown@epicislands.org](mailto:abrown@epicislands.org)**

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**Summary:** *During July 2007 to May 2008, staff from Environmental Protection in the Caribbean (EPIC) sampled 588 waterbirds of 25 species for avian influenza from the Caribbean region. Sampling took place on St. Martin, Anguilla, Antigua, St. Kitts, and Trinidad. EPIC staff was supported on each island by staff from governmental veterinary and agricultural offices as well as members of local non-governmental environmental groups.*

**Program Activities**

During July 2007 – May 2008, we trapped ducks and shorebirds in the Caribbean region, to sample for avian influenza.

We received sampling permits from St. Martin, Anguilla, Antigua, St. Kitts, and Trinidad. Permission was received but was not provided in time to sample on Jamaica. We applied for and did not receive permission to sample on Barbados and Dominican Republic. Therefore, we were able to fulfill the requirement of sampling on five islands within the Caribbean region, sampling on St. Martin, Anguilla, Antigua, St. Kitts, and Trinidad.

As per the conditions of the contract, our overall goal was to sample for two weeks on five islands, capturing a minimum of 100 birds per island. Trapping methods on all islands included mist-nets, walk-in traps, swim-in traps, bow-nets, and noose traps. The sampling was always done at the wetland where the birds were trapped. In most cases, birds were double-sampled, using both tracheal swabs and cloacal swabs.

All of our samples were sent to Dr. Erica Spackman at the USDA Southeast Poultry Research Laboratory in Athens, Georgia. As of 30 May 2008, we had not been provided with any results.

**Methods of Work Used**

*Mist-nets:* Mist-nets were our primary trapping method. These were used in roost areas, foraging areas, and within flight paths of birds that were moving between roost and forage areas. We used mist-nets at all times of day but found the highest capture rates to be early in the morning, often before sunrise. We attempted to get nets open while it was still dark so that birds would not be aware that nets were set. As it became light outside, large groups of birds would move from their nocturnal roost areas to their diurnal foraging areas. During this period, we would capture a portion of the flock of birds as they

entered the area. If it was still dark enough to remove the birds from the nets without un-trapped birds observing us, we would, otherwise we would wait until there were no more birds moving into the area before removing birds from the mist-nets. Once the birds were removed, they were placed in boxes large enough for the birds to stand up in. The boxes were then brought to a shaded area where we would set up a mobile laboratory for sampling the birds. The birds were removed individually from the box. The birds would be banded, measured, swabbed both in the trachea and the cloaca, weighed, and then released back to the foraging area where the bird had been trapped.



Setting up a mist-net on Antigua

*Bow-net:* Our bow-net had a seven-foot diameter and was remotely released, allowing to be used from up to 500ft away. Bow nets were placed in areas of high travel for both shorebirds and ducks, often in dry areas where the birds roost. These nets could be left out all day and night and checked on regularly to see if birds were within the trap area. Once birds were trapped, birds would be removed from the trap and placed in boxes large enough for the birds to stand up in. The bow-net would then be re-set. The boxes were then brought to a shaded area where we would set up a mobile laboratory for sampling the birds. The birds were removed individually from the box. The birds would be banded, measured, swabbed both in the trachea and the cloaca, weighed, and then released back to the foraging area where the bird had been trapped.



**Bow net set up on Antigua**

*Walk-in/Swim-in Trap:* These traps are placed in both roost areas as well as foraging areas. They are baited with corn or chicken feed. The doors on the trap are folded into a funnel, allowing birds to enter but not leave. These traps were placed out in wetlands and left with the doors open, allowing birds free access to come and go, to forage on the bait that is placed within the trap. Once birds are observed coming and going freely, the doors would be shaped into a funnel, allowing the birds to only enter. The traps were checked regularly. When a bird was trapped, it would be removed and the trap would be re-set. The birds would be placed in boxes large enough for the birds to stand up in. The boxes were then brought to a shaded area where we would set up a mobile laboratory for sampling the birds. The birds were removed individually from the box. The birds would be banded, measured, swabbed both in the trachea and the cloaca, weighed, and then released back to the foraging area where the bird had been trapped.



**Walk-in/Swim-in Trap from St. Martin**

*Noose-trap*: These traps would be set out into both roost and foraging areas. They target birds that are walking around, and trap birds when they place the leg on the noose carpet. The traps rely on the fact that the birds do not see them. These traps are placed out while biologists were in the area to assure the safety of birds once they are trapped. When a bird was trapped, it would be removed and the trap would be re-set. The birds would be placed in boxes large enough for the birds to stand up in. The boxes were then brought to a shaded area where we would set up a mobile laboratory for sampling the birds. The birds were removed individually from the box. The birds would be banded, measured, swabbed both in the trachea and the cloaca, weighed, and then released back to the foraging area where the bird had been trapped.

## **Results**

### **St. Martin**

No avian influenza was found on St. Martin. St. Martin is the island headquarters for Environmental Protection in the Caribbean (EPIC) therefore we had both sufficient resources and personnel to support the AI sampling team. We sampled birds on St. Martin from 9-18 January. Sampling took place at Etange Poisson, Gallion Pond, Orient Pond, Grand Case Pond, Mullet Pond, and the Millennium intertidal zone. Overall, we trapped 113 birds of 15 species. The most birds were captured

at Gallion Pond. We found the most success using mist-nets for trapping shorebirds. The majority of shorebirds and waders were trapped during pre-dawn hours when birds moved from their nocturnal roost areas to their diurnal forage areas. Ducks were trapped in both mist-nets as well as walk-in traps.



**Wilson's Plover captured on St. Martin**



**Mist-nets on Orient Pond, St. Martin**

### Anguilla

No avian influenza was found on Anguilla. While sampling on Anguilla, we worked with Dr. Valarie Thomas, the Chief Veterinary Officer for the Department of Agricultural of Anguilla and Farah Mokida, the head biologist of the Anguilla National Trust (ANT). We provided training on trapping and handling methods of wild birds to both Dr. Thomas and Ms. Mokida.

We trapped on Anguilla from 19-28 January. We trapped a total of 104 waterbirds of seven species. We were only able to successfully trap birds at one location, Road Salt Pond. All birds were trapped using

mist-nets. While attempts were made to trap additional birds with bow-nets and walk-in traps, no birds were captured with these techniques. Birds were trapped successfully during both pre-dawn hours when birds are moving from nocturnal roost areas to diurnal foraging areas and post-dusk hours when birds are moving back to nocturnal roost areas.

The staff that supported our efforts on Anguilla, expressed great interest in continuing sampling efforts next year.



Staff from EPIC and the Anguilla National Trust setting up mist-nets on Anguilla.

### Antigua

No avian influenza was found on Antigua. While sampling on Antigua, we worked with Dr. Camilo Diaz who is a veterinarian with the Veterinary and Livestock Division of Antigua, as well as members of his staff. Junior Prosper, who is a biologist with the leading environmental group on Antigua Environmental Awareness Group (EAG), sampled with us on multiple days. We provided training on trapping and handling methods of wild birds to these individuals.

We trapped on Antigua from 29 January – 7 February. We trapped a total of 114 waterbirds of ten species on Antigua. While there were multiple potential trapping locations on Antigua, we only had success trapping birds at two locations, McKinnon's Pond and Fitches' Creek Pond. Mist-nets were the most successful trapping method for shorebirds, waders, and ducks. Additionally, ducks were targeted with swim-in traps, walk-in traps, and bow-nets, but we were unable to capture birds with these methods. The majority of birds were trapped during pre-dawn hours when birds were observed moving from nocturnal roost to diurnal foraging areas.

The staff of the Veterinary and Livestock Division of Antigua has expressed interest in continuing sampling for avian influenza on Antigua.



EPIC staff Melissa Wolfe sampling a Black-necked Stilt on Antigua.



Staff from EPIC and the Veterinary and Livestock Division of Antigua removing a Black-necked Stilt from a mist-net.

### St. Kitts

No avian influenza was found on St. Kitts. Permission was provided for trapping by the St. Kitts and Nevis Veterinary Services. The Chief Veterinary Officer, Dr. Tracey Challenger, hoped to work with us in the field but was unable to attend.

We trapped on St. Kitts from 7-17 February. A total of 135 waterbirds of six species were trapped on St. Kitts. All birds trapped were captured during two pre-dawn mornings at South Friar's Pond, capitalizing on the birds movements from nocturnal roost areas to diurnal forage areas. There were no ducks trapped on this island despite efforts using mist-nets, walk-in traps, walk-in traps, and bow-nets. While we observed thousands of shorebirds and waders island-wide, there were few ducks seen.



**South Friar's Pond, St. Kitts**



**EPIC staff Melissa Wolfe removing Stilt Sandpipers from a mist-net at South Friar's Pond, St. Kitts.**

## Trinidad

No avian influenza was found on Trinidad. While working on Trinidad, we worked with Dr. Selene Warren of the Trinidad Ministry of Agriculture Land & Marine Resources as well as members of her staff. Furthermore, we received support scouting potential trap areas by the Trinidad Wildlife Division.

We trapped on Trinidad from 18 February – 2 March. A total of 128 waterbirds of 12 species were trapped on Trinidad. Birds were trapped at two locations; all the shorebirds were trapped at the Brickfield Shorebird Sanctuary and all the ducks were trapped at the Point a Pierre Wildfowl Trust. The shorebirds that were trapped were captured using mist-nets during both pre-dawn and post-dusk periods, when birds were travelling from the mud-flat foraging areas to the mangrove roost areas. The ducks were all captured using walk-in traps. The ducks at this location, while migratory, are regularly fed during the winter by members of the Wildlife Trust staff and were easily trapped with walk-in traps. Other than at the Wildlife Trust, there were very few ducks observed on Trinidad.

Dr. Warren and her staff are very interested in continuing sampling efforts on Trinidad in the future.



Staff from EPIC and Trinidad Ministry of Agriculture Land & Marine Resources



Whistling Ducks roosting at the Point a Pierre Wildfowl Trust

### **Programs Success/Failure:**

#### Successes

Overall, our sampling program in the region was a huge success. Foremost, was our ability to capture and sample our pre-established quota of birds ( $n=100$  per island), as well as additional 89 birds. The total birds captured ( $n=588$ ) gave us 117% of our quota of sampled birds. Our trapping success came from experience in the field. Our trapping efforts during the initial trapping days, allowed us to see what methods worked for sampling waterbirds in this region. Once we were able to isolate particular trapping methods for certain species of bird, our capture success rates went up. (Fig. 1)

The data collected in the Caribbean region will be shared in a global database available to veterinarians and biologists world-wide. Within this database, specialists will be able to query which species were captured on which islands as well as look at specific groups of birds. If disease is in fact found in birds from the region, it will allow regional veterinarians and biologists to look more specifically at the disease and the birds that are affected by it.

In addition to our trapping success, we were able to work with veterinarians and biologists from most of the islands we sampled on. This interaction allowed us to share insight into both the natural history of the birds we were trapping and the health of individual birds. This also allowed us to train staff from individual islands on trapping and sampling methods, fostering interest in future sampling by island residents throughout the region. (Fig 2)

Financially, we saved thousands of dollars by having multiple in-kind donations made to our sampling program. Specifically, we were provided with housing on St. Martin and Anguilla. Additionally,

transportation was provided by the Trinidad Ministry of Agriculture Land & Marine Resources on Trinidad.

### Failures

While we feel our sampling program, overall, was a success, there were aspects that could have been improved upon. Most notably, our lack of success trapping ducks. This was due in part to not having the appropriate trapping equipment to capture this group of birds. We had limited success capturing ducks with mist-nets and walk-in/swim-in traps. The common trapping method during the over-wintering period is a rocket-propelled net. We were unable to get permission to travel with the explosives that are required to shoot the rocket net. While we had hoped to overcome this with increased use of other trapping methods, we fell short of our hoped for quota of trapped/sampled ducks.

### Recommendations

There are two aspects of our trapping that we would change in the future. Specific to sampling effort, we would recommend to our partners on each island, to begin placing bait out for ducks each week for at least a month before we begin trapping on that island. This would allow the ducks to become accustomed to a trap area and to get feeding on the bait as part of their daily foraging schedule. On Trinidad, we had the fortune to trap and sample ducks in a duck conservation area, where staff of the conservation area feed wild ducks daily. This feeding regimen allows the ducks to get used to baiting and approaching man-made structures, in this case the ducks are fed from a feeding trough. We were able to place our walk-in/swim-in traps around the feeding troughs and have a high capture rate.

Specific to the resident staff we worked with, we recommend having the veterinary and biology staff on the islands we sampled on, continue the sampling regimen in the future. At the end of each of our sampling periods, the staff we worked with felt comfortable setting up traps and capturing birds. After two weeks of sampling on each island, we felt comfortable having the local staff take over the sampling efforts. This would allow the local staff to sample regularly throughout the year, targeting both resident and migratory birds, and have higher success trapping duck species, by feeding ducks over a longer period of time.

Specific to the funding agency and the overall direction of sampling in the region, we recommend continued funding for avian influenza sampling in the region. This past year has shown that birds can be successfully sampled in the region with a minimum amount of effort. This was due to both having EPIC staff in the region leading the sampling effort, but also was due in good part to the support we received from island staff. While the resident staff now has the appropriate skills to sample, they all lack the funding to pay staff for such projects. The funding that EPIC received for this past sampling year would be sufficient to support the sampling efforts of staff on a minimum of five islands. We encourage the funding agency to transfer remaining and/or additional funds to local resident staff on the islands we sampled on over the previous year; these islands include St. Martin, Anguilla, Antigua and Barbuda, St. Kitts and Nevis, and Trinidad and Tobago. This will allow island residents to continue the sampling efforts EPIC started in the area and build a Caribbean region-wide database on avian disease in wild birds.

**Figure 1. Total species of waterbird sampled on St. Martin, Anguilla, Antigua, St. Kitts, and Trinidad in the Caribbean region from January – March 2008.**

<b>Species</b>	<b>Total Sampled</b>	<b>St. Martin</b>	<b>Anguilla</b>	<b>Antigua</b>	<b>St. Kitts</b>	<b>Trinidad</b>
Black-bellied Plover	3	3				
Black-bellied Whistling Duck	13					13
Black-necked Stilt	111	5	71	22	13	
Blue-winged Teal	1	1				
Common Moorhen	1	1				
Fulvous Whistling Duck	1					1
Great Egret	1	1				
Greater Yellowlegs	2			1	1	
Green Heron	5	2	1			2
Green Kingfisher	1					1
Least Sandpiper	27	21	1	4		1
Lesser Yellowlegs	10		2	2	6	
Muscovey Duck	2					2
Purple Gallinule	3					3
Ruddy Turnstone	1	1				
Semipalmated Plover	33	29				4
Semipalmated Sandpiper	89	21	1	3		64
Shortbilled Dowitcher	32	12		2	1	17
Snowy Egret	2	2				
Spotted Sandpiper	29	2		3	7	17
Stilt Sandpiper	202		23	73	106	
Western Sandpiper	2					2
Whimbrel	1			1		
White-cheeked Pintail	9	3	4	2		
Wilson's Plover	7	7				
<b>Total</b>	<b>588</b>	<b>111</b>	<b>103</b>	<b>113</b>	<b>134</b>	<b>127</b>

**Figure 2. Agency and head veterinary and biology staff on each island EPIC sampled on from January – March 2008.**

<b>Island</b>	<b>Partner Agency</b>	<b>Contact Person</b>
St. Martin	EPIC	Adam C Brown
Anguilla	Department of Agriculture of Anguilla	Dr. Valarie Thomas
Anguilla	Anguilla National Trust	Farrah Mokida
Antigua	Veterinary and Livestock Division of Antigua	Dr. Camilo Diaz
Antigua	Environmental Awareness Group	Junor Prosper
St. Kitts	St. Kitts and Nevis Veterinary Services	Dr. Tracy Challenger
Trinidad	Trinidad Ministry of Agriculture Land & Marine Resources	Dr. Selene Warren