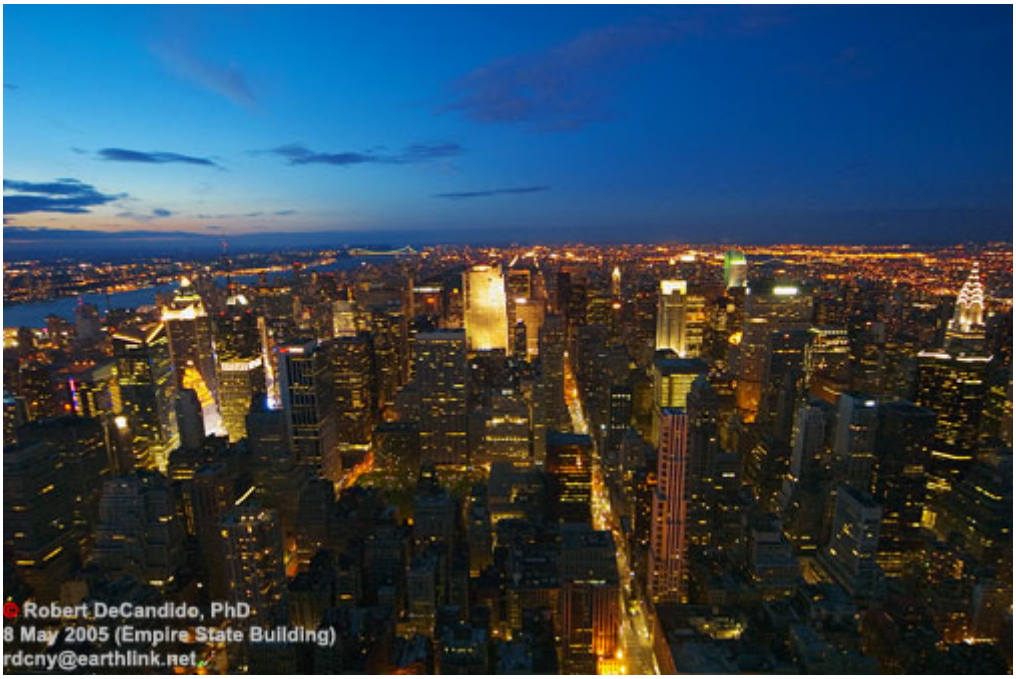
Night Moves:

Nocturnal Bird Migration from the Top of the Empire State Building

Robert DeCandido, PhD with photos by Deborah Allen



Night Moves: Nocturnal Bird Migration…Empire State Building
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"You've got the biggest one of them all," an ornithologist friend told me. Of course he was referring to my study site, the Empire State Building here in New York City. During spring and autumn 2004, I counted birds in migration each night from the top of one of the world's tallest skyscrapers. I was never alone: colleagues and friends quickly became part of this rapid flight assessment team. We were joined by others visiting from faraway places who never imagined they too would be bird watching at night in New York City. Below us were the lights on Broadway, and above us only sky. In between came the migrating birds like small shooting stars, winging their way north in spring and moving south again in fall. How many would we see? When and how might the birds be affected by the bright city lights? If we could address these and similar questions in our research, then we would have taken a small step forward in our knowledge of nocturnal migration.

I embarked upon this endeavor with some anxiety. I usually do my scientific investigations in reasonable proximity to something green: trees and wildflowers are my field companions. Here at the Empire State Building, I would be perched above a chessboard of buildings night after night from dusk till midnight. My vantage point at 1050 feet above sea level would provide a magnificent view many miles in all directions, but would I learn anything significant about birds and their migration in the middle of a city? I also knew that I was venturing into research of a highly emotional and controversial nature: in some cities during the last century, the lights on tall buildings were suspected of causing the deaths of many thousands of night migrants.

After careful consideration, I decided this study was essential from a conservation biology perspective. Comparatively few studies have been done on migrating birds in urban areas, so I wanted to understand the positive and negative effects that cities have upon migrants. Also, the Empire State Building is no ordinary skyscraper: it is an icon. Anything we reported via our research here would move quickly round the world. With some luck, our recommendations to make New York's skies safer for night migrating birds would then be adopted in other cities. If the Empire State Building was a significant factor in the deaths of nocturnal migratory birds, I wanted to document that, and to develop strategies to reduce or eliminate bird deaths. On the other hand, if the building and its lights did not affect migratory birds significantly, it would be important to make that known to those who could directly affect the lives of migrating birds in New York City and elsewhere. My guiding principle would be to report what I saw accurately and honestly, to be as impartial an observer as possible.

In order to understand the effects of tall buildings on night migrating birds in the past, I began reading late 19th century newspaper and magazine accounts in the New York Times, Harper's Illustrated Weekly and elsewhere. I discovered that on the evening of August 22nd in

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1888 after a cold front passed through New York City, almost 1,500 migratory birds were found dead below the nearby Statue of Liberty apparently drawn to the newly installed electric lights on the Statue. During the next several years, after studying specimens brought to the Department of Ornithology of the American Museum of Natural History, a scientist there concluded that many more dead birds were found during autumn rather than spring migration in New York City. And of the 100+ species found dead at the Statue of Liberty, the Common Yellowthroat was the most frequently collected bird, with 60% of all individuals belonging to this species. Such observations are still true till today: in New York City, most casualties occur during autumn migration, from late August through mid-October. Neotropical migrants (warblers, vireos, orioles, and thrushes) seem most vulnerable, with warblers such as Common Yellowthroats and Ovenbirds collected in high numbers.

Fast forward our time machine: on the foggy evening of September 11, 1948, approximately 750 migrating birds of at least 30 species were found dead or injured below the Empire State Building in mid-town Manhattan. The migrators that night were moving south, pushed by an advancing cold front that had stalled in the New York City area. Instead of flying past the Empire State Building that night, the birds were likely attracted to the lights of the skyscraper shining through the fog. Beginning after midnight, dead birds rained down on nearby city streets. Warblers comprised more than 90% of the birds killed. As a result of such incidents involving neotropical migrant species here and in other cities such as Baltimore, Philadelphia and Nashville, the National Audubon Society reached agreements to reduce the amount and type of lighting used at tall buildings and towers.

After the September 11th tragedy in lower Manhattan in 2001, the lights on the Empire State Building were kept on all evening to commemorate those who had lost their lives, and as a visual display of the resilience of New York City. This all-night lighting also renewed worries in New York City's birding community. We knew that most birds migrate somewhere between 1,000 to 2,500 feet above ground level in the New York City area, or just above the height of most of the city's skyscrapers. What concerned all of us was the effect the lights of the Empire State Building might be having upon migrating birds. So on a cold spring evening in April 2004, I rode the elevator to the 86th floor Observation Deck and began my year-long study.

Our first year's results shocked almost everyone. In both the spring (April-May) and autumn migration season (August-November), we did not see a single bird strike the Building or Tower. For all of 2004, we found a total of seven dead birds that we believe died during migration at the Empire State Building. These were recovered after an evening of strong rain. On a few occasions when skies were overcast and light winds prevailed, we watched birds circling the Empire State Building Observation tower, but the next morning, no dead birds were found at the building or in the nearby vicinity. Surprisingly, on evenings of heavy migration, birds would sometimes land on the building. At least twice on rainy and windy spring nights, birds took refuge on the railing of the Observation Deck. On the calm night of October 18th an Eastern Phoebe landed above me, and used this perch to fly out and catch insects for 10 minutes or so. On other occasions, we observed birds such as Black-throated Blue Warblers, Northern Flickers

and Yellow-bellied Sapsuckers land on the illuminated tower for up to 90 minutes before resuming their migration.

For the year, we counted approximately 3,500 migrants in spring, and another 10,500 in fall. Most of the migration in both seasons occurred on nights when winds were greater than 15mph. On such nights, migrants passed the Empire State Building with no difficulty that we could detect. We generally saw small birds migrating in "loose associations" and not tight flocks. On good flight nights, migrants would arrive in waves of up to 25 birds and continue past us for a minute or so, then there would be a pause until the next wave arrived. Occasionally in autumn we would see a flock of Robins traveling together, but we came to view the night migration of birds as the movement of individuals across the night sky. Our highest single-night total in 2004 occurred on October 11th. That evening from 7:03pm till 11:45pm, we counted 1,578 small migrants such as warblers, woodpeckers and sparrows. During the peak hour of migration from 10-11pm, we saw 442 birds pass by, or about one migrant every eight seconds.

Examining the data we collected and historical reports from New York City, we believe that nights when big (more than 100) bird kills occur are unusual and should be considered rare events. Such events are likely the result of poor weather conditions (rain, heavy fog, etc.). Second, we believe that when birds are killed during the migration season in New York City, it is not happening atop the tallest buildings. Rather these deaths probably occur in the early morning hours as birds come down to look for and land in a safe place to feed and rest. At ground level in Manhattan, there are endless streets of plate glass windows reflecting the sky or trees of nearby parks. Others have potted plants or shrubs placed near the window, offering an inviting but deadly picture. Our night migration research in 2004 supports the findings of Dr. Daniel Klem, Jr. of Muhlenberg College. Dr. Klem has shown that reflective glass at or near ground level is responsible for the annual deaths of countless migratory (and resident) birds in both urban and suburban America. As a result of Dr. Klem's research, people in cities such as Toronto, Chicago and even here in New York have joined with building managers to identify "problem" buildings and make them safer for migrating birds. These "Safe Flight" initiatives are springing up in cities all across America, very often sponsored by local Audubon Society chapters.

In our study from the Empire State Building, we also noted important differences between spring and fall migration. During spring, we found that birds generally migrated higher above us than in autumn, probably the result of birds riding in warm air currents coming up from the south that override heavier, cooler air. We counted fewer migrants overall too, and most of these came through in a briefer time frame.

In autumn, many more migrants were counted, with the first ones seen in early August, and the last in mid-November. We also made important scientific discoveries. We observed Ospreys in migration on two occasions at night over land, something that no one had ever observed before. And, we saw Peregrine Falcons regularly hunting by the light of the Empire State Building. On one particularly exciting October night, we watched in amazement as a

Peregrine soaring above us made repeated dives at the migrants. The falcon would catch a bird, drop it off on a ledge of the tower, zoom out and then "wait on," hanging in mid-air above the Observation Deck for the next group of migrants to appear. On that night in just 30 minutes alone, the falcon made 25 dives and caught 7 birds. For the season, we saw 111 Peregrine hunting attempts, with captures of migrating birds made on 37 occasions (a 33% success rate). These results indicate that at certain times of the year in New York City, Peregrine Falcons obtain more food at night than during the day.

Beyond the scientific value of our observations we witnessed something just as important: birders and non-birders alike were deeply moved when they saw birds in migration at night. Whether it was seeing a quarter-ounce kinglet in its mad rush across the black sky, or hearing the flight “chips” of hundreds more emanating from the darkness above, people stopped to watch and listen to the night moves of birds. This gave me hope: once people were aware, they cared. And because our team’s migration reports reached Empire State Building management, they wanted to help too: beginning in August, building engineers and security people turned off the tower lights at exactly midnight every night, and they still do. On foggy or rainy nights during the migration, the policy now in effect is to turn out the lights much earlier in the evening if large numbers of birds are seen circling the building. We hope these policies are instituted at tall buildings throughout the world.

In the bigger picture, we need more studies about the behavior of birds in migration at night, especially as they move past tall buildings and towers. Recent research by Dr. Joelle Gehring of Central Michigan University shows that fewer avian collisions occur at tall structures near cities, but we do not know why. What we do know now is that each site is unique because of its location, the number and species of birds that pass through the area in migration, wind/weather patterns, type and intensity of lighting used, etc. We need to understand what elements do not pose a hazard to migrating birds, and then try similar designs elsewhere. Not every building or tower is bad just because it is big. If we can identify "problem" buildings and lighting arrays, we can work with structural managers to make things better for migrating birds. Our study shows that if building managers are provided with accurate information they will work cooperatively in good faith with scientists and birders to protect migrating birds.

Dr. Robert DeCandido is an urban ecologist and a research associate scientist at the Hawk Mountain Sanctuary. Along with photographer Deborah Allen, they have studied migrating birds in New York City, and in Asia from Israel east to Thailand and Malaysia. Currently they lead bird tours in Central Park. If you want a free copy of their Spring or Autumn 2004 night migration report, just email them at: rdcny@earthlink.net