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## Nocturnal Migrants Foraging at Night by Artificial Light

Daniel J. Lebbin,<sup>1,5</sup> Michael G. Harvey,<sup>1</sup> Timothy C. Lenz,<sup>2</sup> Michael J. Andersen,<sup>3</sup> and Jesse M. Ellis<sup>4</sup>

**ABSTRACT.**—Artificial lights can have detrimental effects on nocturnal migrant birds and other wildlife, yet some species of typically diurnal insectivorous birds are capable of foraging at night under artificial illumination. Here, we report observations of at least 15 wood-warbler species (Parulidae), one tyrant-flycatcher (Tyrannidae), and one mimid (Mimidae) foraging at night in areas illuminated by powerful artificial lights. To our knowledge, our observations represent the first report of a mixed-species flock of birds foraging on insects attracted to artificial lights or within foliage illuminated by artificial lights at night. *Received 2 October 2006. Accepted 14 December 2006.*

Artificial light sources can have negative effects on birds and other animals (Le Corre et al. 2002, Bird et al. 2004, Rich and Longcore 2006). However, some diurnal bird species are capable of using artificial lighting to forage at night. Here, we report observations

of at least 15 wood-warbler species (Parulidae), one tyrant-flycatcher (Tyrannidae), and one mimid (Mimidae) foraging at night in areas illuminated by powerful artificial lights.

### METHODS

MGH and TCL noticed a large number of flight calls at 2130 hrs EST on 11 October 2005 near the house of MGH, ~1 km from Schoellkopf Field within Cornell University's football stadium in Ithaca, New York (42° 26' N, 76° 26' W). MGH and TCL contacted additional observers and about a dozen people gathered at the stadium. Powerful artificial lights (156 1,500-watt metal halide bulbs mounted in 2 groups of 30 bulbs and 4 groups of 24 bulbs) illuminated the stadium following an evening athletic practice and for the duration of our observations. We recorded observations within and along the periphery of the stadium until the lights were turned off shortly before 0200 hrs on 12 October 2005. The group searched the stadium area with individuals or small groups of observers at times separating to cover different areas simultaneously. Winds conducive to migration occurred across much of the northeastern United States during this period and several days prior, while a stalled cold front caused light precip-

<sup>1</sup> Department of Ecology and Evolutionary Biology, Cornell University, Ithaca, NY 14853, USA.

<sup>2</sup> Cornell Laboratory of Ornithology, Ithaca, NY 14850, USA.

<sup>3</sup> Macaulay Library, Cornell Laboratory of Ornithology, Ithaca, NY 14850, USA.

<sup>4</sup> Department of Neurobiology and Behavior, Cornell University, Ithaca, NY 14853, USA.

<sup>5</sup> Corresponding author; e-mail: djl42@cornell.edu

itation during the night of observation (Dinsmore and Farnsworth 2006).

### OBSERVATIONS

We heard thousands of migrants calling from inside the stadium, creating a constant background noise of bird calls. These calls came from birds flying low overhead and birds that had landed in and around the stadium. Near the start of observations, MGH and TCL counted 26 flight calls belonging to a variety of species in one 10-sec period (extrapolated to 156 calls/min). Numbers for each species (Dinsmore and Farnsworth 2006: 16 [Table 1]) were difficult to estimate because of apparent high call rates and the potential for double-counting circling birds. Large numbers of Savannah Sparrows (*Passerculus sandwichensis*), Yellow-rumped Warblers (*Dendroica coronata*), and other migrants were immediately apparent. Some species actively foraged among the foliage of illuminated trees and a few species sallied into the air to capture insects attracted to or disoriented in the stadium lights. Most insects pursued were moths, although birds also captured non-Lepidoptera. A Gray Catbird (*Dumetella carolinensis*) made one long ~10 m sally to hawk an insect from the air under a stadium light. Both Eastern Phoebe (*Sayornis phoebe*) and Nashville Warbler (*Vermivora ruficapilla*) were observed by MJA sallying after moths. Northern Parula (*Parula americana*), Blackburnian (*Dendroica fusca*), and Palm warblers (*D. palmarum*) searched for food among the foliage of illuminated trees. Black-and-white Warblers (*Mniotilta varia*) foraged creeping along large branches of illuminated trees and Common Yellowthroats (*Geothlypis trichas*) foraged among the foliage of lower bushes, but also frequently perched higher in the canopy of trees with other birds. Black-throated Blue (*Dendroica caerulescens*), Black-throated Green (*D. virens*), and Bay-breasted warblers (*D. castanea*) made aerial sallies after insects and appeared to glean insects from foliage. Yellow-rumped Warblers and American Redstarts (*Setophaga ruticilla*) were seen mainly using aerial sally maneuvers to take insects from foliage or the air. We suspected that six other wood-warbler species, including Ovenbird (*Seiurus aurocapillus*), Tennessee (*Vermivora peregrina*), Chestnut-sided (*Den-*

*droica pensylvanica*), Magnolia (*D. magna*), Blackpoll (*D. striata*), and Hooded warblers (*Wilsonia citrina*), were also foraging by artificial light but could not confirm these behaviors. Many individuals and species of warblers foraged simultaneously within the same trees interacting with each other as is typical in mixed-species flocks during daytime. We did not observe foraging behavior in less insectivorous species such as Rose-breasted Grosbeak (*Pheucticus ludovicianus*) and Savannah Sparrows. These species simply perched in trees, on bleachers, or on the artificial turf field. A single Red-tailed Hawk (*Buteo jamaicensis*) perched on the roof above the stadium and made at least one flight across the stadium. However, we could not confirm whether this bird attempted to attack potential prey or attempted to hunt nocturnally within the artificially illuminated area.

### DISCUSSION

To our knowledge, this is the first report of a mixed-species flock of diurnal insectivorous birds actively foraging both in artificially illuminated vegetation and on insects attracted to artificial light sources. We observed additional events of mixed-species warbler flocks foraging late at night under the artificial lights at this location during 29 August and 15–16 September 2006 including light-aided nocturnal foraging among Yellow (*Dendroica petechia*), Magnolia, Blackpoll, and Cape May warblers (*D. tigrina*) sallying from the top of an illuminated conifer. Our observations may also represent the first examples of artificial light-aided nocturnal foraging for all species reported here except Gray Catbird, American Redstart, and Eastern Phoebe (Latham 1936; Bakken and Bakken 1977; Robert DeCandido, pers. comm.).

We suspect the lights caused problems for birds orienting in the sky, but most of the birds appeared to have no trouble orienting in trees and near the ground below the lights. We observed few mortalities during 11–12 October 2005, although one dead Ovenbird and one dead female Black-throated Blue Warbler were recovered from the stadium and nearby buildings. We captured four Common Yellowthroats trapped in open lit doorways and released them away from buildings after the stadium lights were turned off. We were sur-

prised that we encountered relatively few thrushes on or near the ground, despite the number and diversity of flight-calls from thrushes passing overhead. We are unable to explain why few thrushes landed during this event while so many warblers and other species were grounded.

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## Yellow-throated and Red-eyed Vireos Foraging on Green Anoles During Migration

Paul W. Sykes Jr.,<sup>1,4</sup> Lyn S. Atherton,<sup>2</sup> and Rebecca L. Payne<sup>3</sup>

**ABSTRACT.**—Yellow-throated (*Vireo flavifrons*) and Red-eyed vireos (*V. olivaceus*) were observed feeding on green anoles (*Anolis carolinensis carolinensis*) at two localities in Florida and one in South Carolina. Vireos are long-distance migrants that require foods high in fatty acid content, especially when engaging in migration. It is not unlikely that vireos have an opportunistic foraging strategy to obtain the necessary food requirements, including attacking and consuming prey items such as small lizards. This note provides the first published reports of lizards taken as prey by these two species. Received 24 November 2006. Accepted 20 March 2007.

The diets of North American vireos have been well described (Chapin 1925, Tyler 1950, Williamson 1971, Graber et al. 1985,

Ridgely and Tudor 1989, Rodewald and James 1996, Cimprich et al. 2000). The diet of the Yellow-throated Vireo (*Vireo flavifrons*), based upon analysis of 160 stomachs from specimens collected from April through September in breeding areas throughout North America, consists of 98.3% animal matter and 1.7% plant material (including small fruits and seeds). Insects (Insecta; eggs, instars, and adults of at least five Orders) comprise 95.8% of the animal food with the remainder being spiders (Arachnida) 2.4% and small snails (Mollusca) 0.06% (Chapin 1925). Butterflies and moths (Lepidoptera) accounted for 42%+ of the insects taken and vegetable matter was primarily consumed in fall and winter (Chapin 1925, Rodewald and James 1996). The diet of the Red-eyed Vireo (*Vireo olivaceus*) has been summarized by Chapin (1925), Tyler (1950), and more recently by Cimprich et al. (2000). Food items consist of insects (Insecta; eggs, instars, and adults of at least eight Orders), spiders (Arachnida), small snails (Mollusca), a large variety of small fruits, and occasion-

<sup>1</sup> USGS, Patuxent Wildlife Research Center, Warnell School of Forestry and Natural Resources, University of Georgia, Athens, GA 30602, USA.

<sup>2</sup> 1100 Pinellas Bayway I-3, Tierra Verde, FL 33715, USA.

<sup>3</sup> 4716 Shorecrest Dr., Orlando, FL 32817, USA.

<sup>4</sup> Corresponding author; e-mail: paul.sykes@usgs.gov

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