

NESTING MERLINS (*Falco columbarius*) IN AND NEAR ITHACA, NEW YORK, 2015.

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The Merlin (*Falco columbarius*) is a recent addition to the breeding birds of New York. Bull (1974) rejected all earlier nesting reports because the descriptions were not fully convincing nor were they supported by photographs or specimens of eggs or the birds themselves. *The Atlas of the Breeding Birds of New York State* (Andrle and Carroll 1988) did not report any nesting Merlins, despite 200,000 hours of field work. Merlin adults and fledglings call loudly throughout the nesting period, frequently use conspicuous perches, and tolerate human activity, as repeatedly observed in this study and as described by Warkentin et al. (2005) in the excellent monograph for *Birds of North America* (hereafter BNA). Merlin could not have nested routinely in New York before 1988 without someone obtaining strong documentation.

Spahn (1998) summarized over ten instances of Merlin nests or fledged young for New York by 1996 including the first fully credible report in 1992 (Montgomery 1992). These early nests were in or near the forests of the Adirondack Mountains. *The Second Atlas of the Breeding Birds of New York State* documented an explosive expansion of Merlin (McGowan 2008) with 47 confirmed nestings plus 84 possible or probable nestings. Most reports were from areas in the Adirondack Mountains with a few south of the mountains.

The southward expansion now includes Ithaca, NY with one or two Merlin nests almost every year since 2006, as known by the authors. Last year, 2014, one Merlin nest in the Ithaca area failed while another Merlin pair was observed feeding fledglings (JLC). A more intensive survey during 2015 found seven Merlin nests in and near Ithaca, NY. This account characterizes these nest sites and nearby landscape, the nesting chronology, the nest success rate, the prey species brought to the nest, and considers reasons for this Merlin expansion.

RESULTS

Five nests were located by use of comments on the <Cayugabirds-L> listserv. Two nests were found by detection of calls and observation of birds in flight (JLC) (Table 1). Five of these nests were within Ithaca, i.e., the City of Ithaca plus the Town of Ithaca. Another nest was in nearby Dryden, providing six nests we studied in detail. A seventh nest on Wells College campus in Aurora, NY

Name	Location	Lat/Long	Jurisdiction	Distance to Two Nearest Nests (km)	Species of Nest Tree	Tree Height (m) / Nest Height (m)
<i>Titus</i>	400-block N. Titus St.	42°44'41.85"N 76°41'57.35"W	City of Ithaca	1.22, 3.06	White Pine	24.6 / 23.4
<i>Cascadilla</i>	Cascadilla Ave. between Cayuga and Tioga Sts.	42°26'39.27"N 76°29'51.71"W	City of Ithaca	1.22, 2.50	White Pine	24.2 / 22.9
<i>Cemetery</i>	East Hill Cemetery Mitchell St.	42°26'16.79"N 76°28'6.32"W	City of Ithaca	2.50, 3.06	White Pine	20.1 / 18.2
<i>Christopher</i>	Christopher Lane x Christopher Cir.	42°28'17.75"N 76°28'0.93"W	Town of Ithaca	1.06, 3.72	White Pine	23.9 / 21.0
<i>Briarwood</i>	Briarwood Lane x Birchwood Lane	42°28'7.63"N 76°27'16.63"W	Town of Ithaca	1.06, 3.62	White Pine	21.4 / 19.0
<i>Dryden</i>	Dryden Elementary School	42°29'19.74"N 76°17'38.53"W	Village of Dryden	13.4, 14.4	White Pine	30.3 / 25.6
<i>Wells College</i>	Wells College, Aurora, NY	42°44'42.33"N 76°41'56.11"W	Village of Aurora	35.8, 36.6	Austrian Pine	--- / 17.3

Table 1. Attributes of Merlin nests observed in and near Ithaca, NY in 2015.

Prey Species	<i>Titus*</i>	<i>Cas.</i>	<i>Chris.</i>	<i>Ceme.</i>	<i>Briar.</i>	<i>Dryd.</i>	Sum
Downy Woodpecker (<i>Picoides pubescens</i>)						1	1
Barn Swallow (<i>Hirundo rustica</i>)					1	1	2
N. Rough-winged Swallow (<i>Stelgidopteryx serripennis</i>)						1	1
American Robin (<i>Turdus migratorius</i>)	1						1
Cedar Waxwing (<i>Bombycilla cedrorum</i>)						2	2
N. Cardinal (<i>Cardinalis cardinalis</i>)			1				1
Baltimore Oriole (<i>Icterus galbula</i>)				1		1	2
House Sparrow (<i>Passer domesticus</i>)	4	3	1	3	4	4	19
Sum of well-observed prey							29
Smaller than House Sparrow		1					1
Larger than House Sparrow		1					1
House Sparrow size	1	1			1		3

Table 2. Prey count by recognizable species as determined by observations of prey carried by adults and from feathers near plucking posts. Some poorly seen prey could not be identified put could be assigned to size categories. Most prey deliveries were so obscured that neither species nor even size could be estimated.

*Nest Site Codes: *Cas.* = Cascadilla, *Chris.* = Christopher, *Ceme.* = Cemetery, *Briar.* = Briarwood, *Dryd.* = Dryden.

was studied for a separate project. We spent 123 hours of observations at the six nest sites, counting an hour spent by two observers together as two hours. Images relating to this study are on CANON iIMAGE GATEWAY, and access can be provided by emailing the corresponding author at confer@ithaca.edu.

Attributes of Nest and Landscape—The Merlin is a circumpolar species that uses a variety of habitats and nest substrates, including ground nests in the tundra (BNA). Merlins do not make their own nests (BNA). We know that at least two nests in our study were built by American Crows (pers. comm. Clark and McGowan). Another nest was built this year (2015) by Fish Crow but taken over by Merlins shortly after construction, although the events around the transfer of “ownership” were not observed. Kevin McGowan has monitored 75–100 crow nests each year for decades in the Ithaca area and estimates there are 300 active crow nests in Ithaca yearly. Crow nests are well built and could be used one or two years later, which provides a choice from perhaps 500 nests suitable for Merlins (McGowan pers. comm.). Given this abundance, we suspect that all seven nests used by the Merlins were built by crows. All seven Merlin pairs selected a nest in pine trees, either White Pine (6) or Austrian Pine (1), although last year one Merlin nested in a Norway Spruce. Nests were either in isolated trees (3), or in one of a pair of isolated trees (1), or in a row of trees (3), but never in a forest. The Ithaca area includes many forests that are frequented by birders. The authors did not hear of any Merlins sighted in forested areas. For the five Ithaca nests, the mean tree and nest heights were 22.8 m and 20.9 m, respectively. For American Crow in Ithaca, the mean tree height and nest height were 21.2 m and 18.7 m, respectively, (McGowan 2001). On average our Merlin trees and nests averaged about 1.9 m higher than the sample for crows. Perhaps Merlins select for higher nests or perhaps the available trees have grown between 2001 and 2015. In Saskatoon, Saskatchewan, Canada, Merlin nests averaged 1.1 m higher than the mean of a sample of crow nests (Warkentin and James 1988).

All nest trees were in or near large areas with little or no underbrush. (See Canon website.) Human disturbances such as children leaving a school, people walking, jogging, or using skateboards, or moving cars were common in the immediate vicinity of several nests and were largely ignored. Males frequently sat on a tall perch and appeared to watch for potential nest predators, and were observed taking off to chase squirrels, crows, Common Grackles, Blue Jays, a Red-tailed Hawk and a Barred Owl. On one occasion, the loading of a moving van seemed to induce repetitive, single-note calling by the male from his guard perch. It appeared to the authors that the Merlins noted our prolonged presence, and that wherever we stood, they utilized plucking posts somewhere else.

Chronology of Nesting—For a typical individual nest, egg-laying, incubation, and the nestling stage require ~70 days (BNA). Among all Ithaca nests, the earliest report of courtship and copulation was on 3 April at the Titus nest. This

nest fledged on 27 June, a span of 86 days (see Figure 1, p. 224). The Briarwood nest fledged on 28 July, a span for all nesting activity in Ithaca of about 117 days.

Nest Success Rates—Three of the seven nests were predated, although this was never directly observed. The female's body was splayed over the side of one nest, which suggests a nocturnal predator, and this was where we saw an adult chase a Barred Owl. Another nest was slightly torn apart. A third nest was empty before the young could have fledged. In general, the Red-tailed Hawk seems the most likely predator, and several Merlin nests were close to nests of this species. The predated Cascadilla nest had three Red-tailed Hawk nests that were 0.7, 1.4, and 1.5 km distant. Raccoon and Great-horned and Barred Owls are also possible predators.

Our nest success rate was 57%. Other, more extensive studies report greater than 90% nest success and did not find predation as a major cause of nest failures (BNA). In our small sample, the average number of chicks fledged was 2.5 per nest. Interestingly, the nest at Briarwood was our latest by more than two weeks, which increases the possibility that it was a first-time nester (BNA), yet it fledged four young. The underside of the female was especially tawny (Fig. 2, p. 224). Among 10 studies described by Warkentin and James (1988) and the BNA account, the average number fledged per nest ranged from 2.6 to 4.0. The Ithaca population may not be self-sustaining, but the small sample from only one year should not be over-interpreted.

Prey—Typically, the male called as he brought food to the nest area. If the female was incubating, she would leave the nest after a few seconds to a minute or so. Prey exchange occurred at any one of several perches and sometimes in mid-air up to ~150 m from the nest, but never at the nest. Sometimes we could get a spotting scope on the prey as the female plucked it, but their use of several plucking posts made this difficult. Several prey species were identified by feathers below plucking posts, for example, the yellow-tipped feathers of Cedar Waxwing, and the tail feathers of House Sparrow. The female often plucked most of the feathers and ate part of the prey before taking it to the nest (Fig. 3). We identified 29 prey items of eight species (Table 2). House Sparrow (*Passer domesticus*) with 19 items was by far the most common prey, as reported for other studies of urban Merlins (BNA). The tally of three swallows attests to the maneuverability of the Merlin.

DISCUSSION

Nesting by Merlins in New York was first observed just to the south of Ontario, Canada. The Merlin population in Ontario has been increasing at ~3.5%/yr. for the last ~50 years according to the North American Breeding Bird Survey (Sauer

et al. 2014, hereafter BBS). Young that dispersed from an increasing Ontario population may well be the source of birds that arrived in northern New York. If the Ontario increase is a return to a pre-DDT level, then it is unclear why Merlins from Ontario couldn't have moved into the forested Adirondack Mountains in pre-DDT times. Given the arrival in forested New York, it is interesting to consider the subsequent expansion and why it seems to be primarily in urban areas.

Food Availability—The predominant prey species, the House Sparrow, declined at 2.5%/yr. for New York for 1966 to 2013 (BBS). This decline in the most common prey species started two decades before the arrival of Merlin and certainly does not explain the recent increase in Merlin.



Figure 3. During incubation, males usually catch and transfer prey to females at some distance from nest. Females usually pluck prey away from nest, as shown here with House Sparrow. Note prey feet and feathers.

DDT Rebound—Merlins were either not present or extremely rare before the 1980s so the recent increase is not a rebound of a New York population

following the ban on DDT. It might nevertheless be related to the rebound of broader regional populations, for instance in Ontario.

Climate Warming—The expansion southward does not fit with global climate change, which appears to have caused the northward expansion of many other species. Perhaps young from the Adirondack Mountains returned to latitudes similar to but somewhat south of their natal area.

Habitat Availability—The park-like landscape used by urban nesters, e.g., East Hill Cemetery, Dryden school grounds, and Wells College campus, does not seem to have changed in availability or condition by our recollection. More broadly, the reforestation of western and central New York State over many decades (Confer and Pascoe 2003) might have played a role in a regional expansion.

Predators on Merlins—The population of Red-tailed Hawks in New York has increased significantly at 0.85%/yr. for the last half-century (BBS), while the New York population of Great Horned Owls declined significantly at 3.5%/yr. (BBS). The net impact of Red-tailed Hawk increase and Great Horned Owl decline on the expansion of Merlin in New York is not known.

Nest Availability—Several studies report that American Crows first moved into and then nested in an urban environment in the 1950s (see Verbeek and Caffrey 2002). In Saskatchewan the establishment of urban Merlins appears to have depended on the prior movement of crows into urban environments and the availability of crow nests in conifers planted in the prairie towns and cities (Warkentin and James 1988). Similarly for New York, the increase in urban Merlins certainly correlates with the relatively new abundance of urban crows and their nests in conifers. It appears likely that urban nesting by crows provided the necessary pre-condition for the increase in urban Merlins.

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Merlins have been expanding their breeding range in New York State. John Confer et al. studied seven nests in and around Ithaca, *Tompkins*, during 2015 (see article, pp. 176-183).

Figure 1 (top). A rainy first day for fledging the *Titus* nest, 27 Jun 2015.

Figure 2 (bottom). The tawny-breasted female from the Briarwood nest, which fledged four young in 2015.