Eastern Phoebes (*Sayornis phoebe)* Breed at Land-based Anthropogenic Sites in the North Carolina Sandhills

Douglas B. McNair[1] and Susan Campbell[2]
[1] 35 Rowell Road, Wellfleet, MA 02667
dbmcnair@gmail.com
[2] 144 Pine Ridge Drive, Whispering Pines, NC 28327
susan@ncaves.com

Introduction

Eastern Phoebes (*Sayornis phoebe*) are behaviorally plastic and adapted very early to use of anthropogenic nest sites, such as bridges and buildings in the vicinity of water in forested habitats (Weeks 1979, 2011). Nest placement of Eastern Phoebes directly over water at water-based anthropogenic sites (bridges, box culverts) has been documented in many areas of central and eastern North America (Coffey 1963, Klaas 1970, Coffey 1976, Jackson and Weeks 1976, Weeks 1979, Faanes 1980, Weeks 2011), including south-central North Carolina in 1981 (McNair 1984). The availability of water-based anthropogenic sites in the Coastal Plain where natural nest sites are scarce or absent has allowed Eastern Phoebes to slowly but steadily expand the southerly edge of their breeding range in southeastern North America (Coffey 1976, Jackson and Weeks 1976, Ware and Duncan 1989, Weeks 2011), including North Carolina and South Carolina (McNair 1984, 1990). In the southerly portion of the North Carolina Sandhills, breeding Eastern Phoebes were "uncommon" in 1981 and they only nested at water-based sites (McNair 1984). Further south in the Inner Coastal Plain of South Carolina (and one outlier record in the Lower Coastal Plain; LeGrand 1993), where nesting was otherwise generally scarce below the Fall Line (Post and Gauthreaux 1989, McNair 1990, McNair and Post 1993), three land-based anthropogenic nest sites have been documented (1988 to 1992), which were located near water bodies (McNair 1990, LeGrand 1993, Carter 2005). Nonetheless, Eastern Phoebes have still not been documented to nest directly over land at land-based anthropogenic sites in any portion of the North Carolina Sandhills. Dry, upland areas of the North Carolina Sandhills with porous, sandy soils are unlikely to provide mud and moss that are required for Eastern Phoebes to build their nests (Weeks 1979, 2011). Thus, we expected any Eastern Phoebe nests at land-based anthropogenic sites to be near water bodies where such nesting material (mud, moss) was available. In this note we document land-based anthropogenic nest sites within a portion of the North Carolina Sandhills, in Moore and Richmond Counties.

Methods

We obtained information about Eastern Phoebe nests at land-based anthropogenic sites in Moore and Richmond counties, North Carolina. Using Google Earth 2012 (version 6.2.2), we measured the straight-line distance (in m) of nests from each confirmed land-based anthropogenic site to the nearest 1) water body (i.e., lake, pond, river, creek, drainage ditch), and 2) water-based anthropogenic structure (small or medium-sized bridge in each case except for one box culvert) where phoebes did or could potentially breed.

Results

All confirmed Eastern Phoebe breeding records at land-based anthropogenic sites in the North Carolina Sandhills were statant nests built on platforms of commercial and residential buildings (porches=3; decks=2; window sill=1; carport=1; kiln=1; light fixture on shed=1; electrical box=1; water holding tank=1; fish observation platform=1) from April through June, with one nest active in July (Figure 1), at a total of eleven locations (Table 1). Most pairs nested twice each year at each location. Seven locations were in Moore County (since 2007), with four locations in Richmond County (since 2011). Of the eight locations used in 2012 that were available in 2013, Eastern Phoebes nested at three (38%) of them. The median (mean; range) straight-line distance from confirmed land-based anthropogenic nest site locations to

Figure 1. Eastern Phoebe nest that contained three large nestlings was located on a ledge inside a carport at the Myers residence, Vass, NC on 23 July 2012.

the nearest water bodies was 95 m (132.6 m ± 120.6 SD, 2-380 m; $n = 11$), closer than the median straight-line distance (710 m, $U = 12$, $P < 0.05$; Mann-Whitney *U*-test) to the nearest water-based anthropogenic structures where phoebes nested at four of these ten (40%) bridges and at one box culvert (928.6 m ± 869.5 SD, 30-2,960 m; $n = 11$; Table 1).

Discussion

Eastern Phoebes in the North Carolina Sandhills have nested on ledges of porches of dwellings or other buildings, land-based anthropogenic sites they typically select from throughout their geographic range (Weeks 2011). Their timing of breeding, except for one late July nest, is similar to water-based anthropogenic nest sites in the North Carolina Sandhills, suggesting that any movements within forests to water or land dominated areas has not influenced nest site selection. Unlike Cliff Swallows (*Petrochelidon pyrrhonota)* at one extralimital site in southeastern North America where delayed breeding occurred (northwest Florida; Lewis and McNair 1998), Eastern Phoebes nesting at land-based anthropogenic sites in the North Carolina Sandhills apparently were not limited by soil materials that were not sufficiently adhesive. As expected, the presence of nearby water bodies has apparently influenced choice of these land-based nest sites by providing sufficient mud and moss for Eastern Phoebe nests in Moore and Richmond counties. However, this issue remains to be tested.

We first documented Eastern Phoebes breeding at land-based anthropogenic sites in a portion of the North Carolina Sandhills in 2007, ten years after Susan Campbell moved to Whispering Pines (1997). It is possible, considering Richmond County nest location No. 8 in particular where phoebes nested on a building immediately adjacent to water, that we could have overlooked previous nesting on land-based anthropogenic sites in the Sandhills. Otherwise, we are confident that Eastern Phoebes did not breed at land-based sites in our portion of the North Carolina Sandhills until around 2007, long after water-based anthropogenic nest sites were occupied in this region (McNair 1984). Furthermore, six of the eleven (55%) confirmed breeding locations did not occur until 2012, which included the first records for Whispering Pines, indicating an ongoing process of occupation of land-based anthropogenic sites in the North Carolina Sandhills even though the number of land-based sites used in 2012 was more than in 2013.

The delay in occupancy of land-based anthropogenic nest sites in the North Carolina Sandhills is expected, even though land-based structures are more readily available. Water-based anthropogenic nest sites in forested habitats at the southern periphery of their breeding range in the Coastal Plain were occupied first since phoebes prefer breeding over water; nesting at water-based anthropogenic sites may provide greater protection from predators and higher nest survivorship compared to terrestrial sites (Weeks 1979, 2011).

Table 1. Confirmed breeding records (statant nests) of Eastern Phoebes at land-based anthropogenic sites in a portion of the North Carolina Sandhills.

No	County	Town	Year	Nest(s) distance (m) to nearest water body	Nest(s) distance (m) to nearest water-based anthropo-genic site	Nesting at nearest water-based anthropo-genic site
1	Moore	West End	2007-2013	95; unnamed pond	1,600; Little River	No
2	Moore	West End	2009-2010	145; Little River	520; Little River	No
3	Moore	Jackson Springs	2011-2012	380; unnamed creek	2,960; Drowning Creek	No
4	Moore	Carthage	2012	345; unnamed pond	710; unnamed creek	Yes
5	Moore	Whispering Pines	2012	57; Thagard's Lake	30; Thagard's Lake	No
6	Moore	Whispering Pines	2012[1]	125; unnamed pond	1,300; Thagard's Lake	No
7	Moore	Vass	2012-2013	35; Lake Surf	135; Lake Surf	Yes
8	Richmond	Hoffman	2011-2013	2; unnamed pond	760; unnamed creek	Yes
9	Richmond	Ledbetter	2012	100; drainage ditch	1,500; Ledbetter Lake	No
10	Richmond	Beaverdam area	2012	85; unnamed pond	640; unnamed creek	Yes
11	Richmond	Hoffman	2013	90; McKinney Lake	60; McKinney Lake	Yes

[1] Site demolished before the 2013 breeding season.

However, the superiority of water-based anthropogenic nest sites has not been demonstrated in southeastern North America even though a modest range expansion dependent upon water-based sites has occurred here (McNair 1984, 1990; McNair, unpublished data). Compared to many other areas of the central and eastern United States such as New England (Weeks 2011), breeding phoebes are still relatively uncommon in the North Carolina Sandhills where some water-based anthropogenic sites are not occupied as documented in this study, despite a modest recent expansion to land-based anthropogenic sites.

Acknowledgements

We thank J. Dalton, D. Hinshaw, S. L. Miller, and T. L. Myers for contributing data and H. Weeks and two anonymous individuals for their reviews of the manuscript.

Literature Cited

Carter, R. M. 2005. An annotated checklist of the birds of Congaree National Park. Chat 69:1-28.

Coffey, B. B., Jr. 1976. The Eastern Phoebe as a summer resident in Mississippi. Mississippi Kite 6:38-41.

Coffey, J. W. 1963. A nesting study of the Eastern Phoebe. Migrant 34:41-49.

Faanes, C. A. 1980. Breeding biology of Eastern Phoebes in northern Wisconsin. Wilson Bulletin 92:107-110.

Jackson, J. A., and R. E. Weeks. 1976. Nesting of the Eastern Phoebe and Barn Swallow in western Alabama. Alabama Birdlife 24:7-9.

Klaas, E. E. 1970. A population study of the Eastern Phoebe and its social relationships with the Brown-headed Cowbird. PhD thesis, University of Kansas, Lawrence.

LeGrand, H. E., Jr. 1993. Briefs for the files: spring 1992. Chat 57:54-63.

Lewis, T. E., and D. B. McNair. 1998. Second breeding locality of Cliff Swallows in Florida. Florida Field Naturalist 26:117-121.

McNair, D. B. 1984. Nest placement of the Eastern Phoebe under bridges in south-central North Carolina. Oriole 49:1-6.

McNair, D. B. 1990. Eastern Phoebe breeds in the northeast upper coastal plain of South Carolina. Chat 54:59-61.

McNair, D. B., and W. Post. 1993. Supplement to status and distribution of South Carolina birds. Charleston Museum Ornithological Contribution No. 8.

Post, W., and S. A. Gauthreaux, Jr. 1989. Birds of South Carolina. Charleston Museum, SC.

Ware, D. M., and R. A. Duncan. 1989. First record of the Eastern Phoebe nesting in Florida. Florida Field Naturalist 17:22.

Weeks, H. P., Jr. 1979. Nesting ecology of the Eastern Phoebe in southern Indiana. Wilson Bulletin 91:441-454.

Weeks, H. P., Jr. 2011. Eastern Phoebe (*Sayornis phoebe*). No. 94 *in* The Birds of North America online. Revised 26 April 2011. Accessed at:
http://bna.birds.cornell.edu/bna/species/094/biblio.