

Ruby-throated Hummingbirds Observed Following Yellow-bellied Sapsucker: Evidence for Keystone Bird Species in Northern Hardwood Forests

The authors document an observed association between Yellow-bellied Sapsucker and Ruby-throated Hummingbird. They conclude that the hummingbirds' feeding at sapsucker wells may effect the timing of hummingbird migration.

by David Flaspohler and David Grosshuesch

Several species of hummingbirds are known to feed at the sap wells created by Yellow-bellied Sapsuckers (*Sphyrapicus varius*; hereafter referred to as 'sapsucker'). Hummingbird-sapsucker associations have been reported in a variety of locations including: New Hampshire (Bolles 1891, Kilham 1953), Michigan (Nickell 1956, 1965, Southwick and Southwick 1980, Foster and Tate 1966), Virginia (Freer and Murray 1935), and California (Sutherland et al. 1982; involving Red-naped Sapsuckers, *Sphyrapicus nuchalis*). Though the phenomenon of hummingbirds feeding at sap wells is well known, few, and often conflicting observations of hummingbird-sapsucker following behavior have been reported (Freer and Murray 1935; Foster and Tate 1966). For example, Bolles (1891) did not observe hum-

mingbirds following sapsuckers, indeed, he reported that hummingbirds were often driven from active sap wells by sapsuckers. Here we describe Ruby-throated Hummingbirds (*Archilochus colubris*; hereafter referred to as 'hummingbird') feeding at sap wells and following sapsuckers as they move from tree to tree. Our observations support the theory that the sapsucker plays an important and potentially keystone role in the hardwood forests of northern Wisconsin.

STUDY AREA AND METHODS

All observations occurred in upland forests of Forest County, within the Eagle River and Florence Districts of the Nicolet National Forest. The three forest stands in which we made the observations are typical of northern mesic forest (Curtis 1959,

Hoffman 1989) and are dominated by sugar maple (*Acer saccharum*), yellow birch (*Betula alleghaniensis*), red maple (*Acer rubrum*), and aspen spp. (*Populus tremuloides*, *P. grandidentata*). Northern hemlock (*Tsuga canadensis*), balsam fir (*Abies balsamea*), and white pine (*Pinus strobus*) make up 2–10% of the canopy within these stands.

Our observations were made incidental to a study of metapopulation dynamics of neotropical migrant songbirds. On four occasions during May–July, 1995 we observed hummingbirds following foraging sapsuckers. We also observed hummingbirds feeding at sap wells created by woodpeckers. The following text summarizes our observations:

27 May; 1015 hrs.—I observed a sapsucker pecking at a sugar maple and calling while a hummingbird flew around it. As the sapsucker “hitched” up the tree, the hummingbird followed it. The sapsucker then flew to a nearby tree (unknown sp.) and called. The hummingbird followed and circled within 3–5 m of the sapsucker. As the sapsucker continued pecking at the tree, the hummingbird perched on a nearby branch, appearing to observe the sapsucker’s activities. When the sapsucker changed positions in the tree, the hummingbird flew to the sapsucker’s prior location and appeared to inspect the sapsucker’s “work.” It never appeared that the hummingbird consumed any sap or insects from the pecked holes. After the hummingbird visited the sapsucker’s recently created holes, it again flew toward the sapsucker and hovered near it. The sapsucker then called

and flew to a nearby tree (unknown sp.) with the hummingbird following it. Similar behavior continued at this new tree. The sapsucker did not remain at any one tree for more than 90 sec. and the hummingbird followed the woodpecker to each of the trees. On three occasions, the hummingbird perched and appeared to watch the sapsucker peck at a tree; once, the hummingbird went to an area that the sapsucker was pecking after the sapsucker had left, and twice, the hummingbird left its perch to follow the sapsucker to a different tree. *D.G.*

31 May; 0915 hrs.—I heard a sapsucker calling in the sub-canopy/canopy and when it landed on a tree, I observed a hummingbird circling it. The sapsucker called and “hitched” up the tree but never pecked at it. The hummingbird hovered near the sapsucker during this time. After about 25 seconds, the sapsucker flew from view with the hummingbird following close behind and the sapsucker calling in flight. *D.G.*

12 June; 1030 hrs.—I observed a sapsucker flying through the sub-canopy with a hummingbird following it. The sapsucker landed in an unknown species of tree, and the hummingbird perched on a branch 0.5–1.0 m away and faced the sapsucker. The sapsucker then pecked the tree, and, after a few seconds, the hummingbird flew toward the sapsucker and hovered near it. The sapsucker then called and flew from view with the hummingbird following behind. *D.G.*

26 July; 0729 hrs.—Four field assistants and I observed a male hummingbird perched on a tree branch 7 m away from another tree (*Quercus rubra*) where a male sapsucker was pecking holes. The hummingbird flew toward the sapsucker and hovered above it for 5–10 sec., and then it was lost from sight. The sapsucker landed in an adjacent tree and began to feed from previously drilled sapsucker holes, then flew north and was lost from sight. About 10–20 sec. following its departure, a male hummingbird (presumably the same individual) began to feed at the sap wells that the sapsucker had just left. The hummingbird appeared to feed on sap from these wells and then flew to an adjacent paper birch (*Betula papyrifera*) and fed on the exuding sap of old sapsucker wells. About 10–15 sec. later, we heard a sapsucker call from the north, and we then saw the hummingbird fly toward the calling sapsucker. *D.F., D.G.*

DISCUSSION

The importance of Yellow-bellied Sapsuckers to other species of birds, mammals, and insects in the forests of Wisconsin has been poorly explored. While making the above observations, we also observed the following species feeding at sapsucker sap wells: dark-phase Gray Squirrel (*Sciurus carolinensis*), wasps (Vespidae), ant species (Formicidae). Of at least 35 species of birds reported to associate with sapsucker trees (Foster and Tate 1966), 20 occurred in or near our study plots during the breeding season. In Michigan, Foster and Tate (1966) found that about 30 groups (species

and families) of arthropods and six species of mammals were associated with sapsuckers and their wells. The keystone role of the closely related Red-naped Sapsucker in the forests of western United States is well documented (Ehrlich and Daily 1988, Daily et al. 1993).

The Ruby-throated Hummingbird is the only member of the family Trochilidae to breed in the forests of northern Wisconsin (Robbins 1991). Because sapsuckers are a common bird of forested areas of northern Wisconsin (Temple and Cary 1987), their sap wells may provide an important source of food to hummingbirds during times when flower nectar is scarce. In North America, the diversity of flowers utilized by hummingbirds shows an inverse correlation with latitude (Austin 1975, Grant and Grant 1967, Miller and Nero 1983). Although little data are available on species of flowers used by Ruby-throated Hummingbirds in northern mesic forests of the Great Lakes, few flowers with the potential to be major nectar sources were noticed on our study plots (approx. 40 ha) during 20 May–15 July. Sapsucker wells may allow hummingbirds to arrive at the breeding grounds earlier and to depart later. Such wells may also contribute to biogeographic patterns of hummingbird distribution, particularly at the margins of their breeding range (Miller and Nero 1983).

As a tree cavity excavator, the sapsucker creates potential nest and den sites for a variety of secondary cavity users in northern forests and may influence the population dynamics of several species of cavity and sap-well utilizing organisms. Howe et al.

(1992) discuss the importance of primary cavity nesters as keystone species (Gilbert 1980) in the forests of northern Wisconsin and classified the Yellow-bellied Sapsucker as a source/core species in this region. Source/core species are those whose geographic range is centered in the Upper Great Lakes region. No data are available on levels of recruitment for sapsuckers in northern Wisconsin. Such reproductive data are essential for understanding a species' population dynamics and are of particular importance for a potential keystone species such as the sapsucker. More research is needed to clarify the community role of sapsuckers in the forests of the Upper Great Lakes, including their interaction with hummingbirds.

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David Flaspohler
Department of Wildlife Ecology
University of Wisconsin
Madison, WI 53706

David Grosshuesch
37 Encantado Way
Hot Springs, AR 71909