Short Communications and Commentaries

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Are *Actitis* Sandpipers Inverted Flying Fishes?

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Field guides often note the "buzzy" flight or short wing beats of Spotted Sandpipers (*Actitis macularia*) and Common Sandpipers (*A. hypoleucos*), without suggesting why they are so different from other members of the Scolopacidae. Other shorebirds, such as Solitary Sandpipers (*Tringa solitaria*), use buzzy flight only in special aerial displays. Gundlach (1875) long ago noted that, when Spotted Sandpipers fly, they do so almost touching the water; this fact alone could explain buzzy flight. The deep wing beats normal in the family would wet the wings of a low-flying bird, so *Actitis* sandpipers buzz along.

The question then is, why do they fly low over the water? Starting at least with Townsend (1909), a series of authors (Jewel 1915, Stone 1925, Sutton 1925, Kelso 1926, Murie 1934, Sutton and Pettingill 1942, Martin and Atkeson 1958, Olioso 1989) have noted that, at the attack of a hawk or even an Eastern Kingbird (*Tyrannus tyrannus*), the Spotted Sandpiper dives under water and swims (using wings and feet) to safety in rocks or vegetation along shore. Diving under water to escape predators is recorded also for Common Sandpipers (e.g. Paulian 1945, Meinertzhagen 1949, Géroudet 1983). I propose that diving and swimming under water, starting from buzzy flight low over the water, is normal antipredator behavior in the genus *Actitis*.

This simple behavior, an uncommon event in other shorebirds (Lima 1993), may have helped the genus to use watercourses with wooded margins in closed habitats. Flying low puts the sandpiper close to the water in case of a swift hawk attack from nearby vegetation. Thus, it can use tropical rivers (Bolster and Robinson 1990) or mangroves to an extent unknown in other sandpipers. It can hide in wooded zones by day and use open flats at night, avoiding falcons (Swinebroad 1964). It can visit narrow rivers and little pools, so long as the water is deep enough for escape. It may have to avoid shallow stretches or pools without border places to hide, where such species as Solitary Sandpipers can live with fast, darting flight as another adaptation against raptors. Nearly always, *Actitis* species fly low over water to escape. Their flight can be relatively slow (Cottam et al. 1942, Schnell 1965), for they are safe if they can dive. In a sense, they are "inverted flying fishes."

Similar short wing strokes in Capped and Whistling herons (*Pilherodius pileatus* and *Syrigma sibilatrix*) or *Amazona* parrots may be used in flying close above vegetation, where the birds dive in on finding food or a perch site, or on the approach of a predator. Lima (1993) discussed diving into vegetation as an escape tactic, without noting special wingstroke patterns.

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On No-chickadee Zones in Midwestern North America: Evidence from the Ohio Breeding Bird Atlas and the North American Breeding Bird Survey

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It has been suggested that in midwestern North America (Illinois, Indiana, and Ohio) there are several narrow latitudinal gaps between the breeding ranges of Black-capped (*Parus atricapillus*) and Carolina (*P. carolinensis*) chickadees (Brewer 1963, Merrit 1981). An analogous no-chickadee band of altitude has been reported for the southern Appalachian Mountains (Tanner 1952). Such no-chickadee zones have been thought to exist because they reduce interbreeding of the two species. However, anatomical, behavioral and electrophoretic evidence suggests that the two species freely interbreed in southwestern Missouri (Braun and Robbins 1986, Robbins et al. 1986). Furthermore, these workers suggested that no-chickadee zones in the Midwest could be confined to habitats submarginal for either species. That is, there is a band of formerly prairie habitat where woodlands are too small and scattered, and where potential cavity nest sites are too scarce to support either species. Thus, birds of the two species may not be avoiding each other, but may be independently avoiding inhospitable conditions. Here, we use records from the Ohio Breeding Bird Atlas (Peterjohn and Rice 1991) and the North American Breeding Bird Survey (B. G. Peterjohn pers. comm.) to test this submarginal-habitat hypothesis that no-chickadee zones in the Midwest are a consequence of poor habitat quality.

The Ohio Breeding Bird Atlas resulted from a five-year effort (1983–1987) to document the breeding status and distribution of all bird species in the state. Birds were noted in 764 25-km^2 census blocks assigned statewide in a stratified-random fashion, and in 113 "special areas" of variable extent that were included because they were of particular ornithological interest. For the five-year period within each of these 877 atlas sites, all species were assigned a breeding status of possible, probable, or confirmed. While atlas workers were not provided with specific guidelines for assigning chickadees to either *atricapillus* or *carolinensis* (B. G. Peterjohn and D. L. Rice pers. comm.), song type was apparently the criterion employed most commonly (T. Bartlett pers. comm.).

The North American Breeding Bird Survey (BBS) was initiated in 1966 and consists of routes that are randomly distributed within 1° blocks of latitude and longitude (Robbins and Van Velzen 1967). In the Ohio region, route density is approximately four per 1° block; the 45 routes in Ohio traverse 61 counties. For seven Ohio routes, a replacement route (located near the original) was initiated between 1979 and 1991; in our study, replacement routes were treated as continuations of original routes. Not all routes were run in each year; in Ohio, routes were run an average of 22 of the 26 years between 1966 and 1991. Routes were run at the peak of the breeding season. At each of 50 stops located at 0.8-km intervals along the 40-km route, an observer recorded the number of individuals of each species heard or seen during one 3-min interval.

Using atlas data, BBS data, and records of percent forest cover in each of Ohio's 88 counties (Dennis and Birch 1981), we tested three predictions deduced from the submarginal-habitat hypothesis for no-chickadee zones. First, the proportion of atlas sites in a county occupied by chickadees, regardless of species, was predicted to be positively correlated with percent forest cover. Similarly, the number of individual chickadees reported on a BBS route was predicted to be positively correlated with the average percent forest cover among counties in which the route occurred. Averages were calculated by weighting percent forest