

## HUMAN "PSH-PSH-PSH" CALLS MIMIC AVIAN DISTRESS CALL

by William E. Davis, Jr.

It was a beautiful, crisp fall morning at the Massachusetts Audubon Society's Wellfleet Bay Sanctuary on Cape Cod on September 23, 1985. At 7:45 A.M., an immature Sharp-shinned Hawk darted out of a tree and unsuccessfully attacked one of the seven or eight Blue Jays that were mobbing it. It then drifted out over the marsh and, a few seconds later, attacked a Northern Flicker in flight, again unsuccessfully. The hawk lit on an open branch and waited. A Mourning Dove flashed across the marsh, and off went the Sharpie in pursuit: failure. The frustration of this young hawk became even more evident as it swooped low over the marsh and made a pass at a flock of about a half dozen Greater Yellowlegs. The birds flew up, and once again the hawk was left without breakfast. The hawk flew my way, and landed in a stand of pines, out of sight, perhaps a hundred feet from me. This was an unusual opportunity for me to test the attractive power of a "psh-psh-psh" call. Usually, a group of chickadees or Tufted Titmice responds to this sound, and it is difficult to tell whether subsequent birds are brought in by my calls or by the alarm notes or other vocalizations of the initially responding and agitated birds. This time no other birds were in sight. I called, "Psh-psh-psh," and up flew the Sharpie, landing less than thirty feet away, alert, looking at me, its head moving from side to side.

This was not the first time that a hawk had reacted dramatically to my pishing. On January 29, 1977, at 9:00 A.M., two Northern Goshawks flushed from a stand of pines about a hundred feet away as I pished. An adult bird flew directly overhead at treetop level, and an immature that flew in with it perched in a tree twenty feet directly above me (Davis 1978). On January 9, 1985, at 3:00 P.M., just north of San Francisco, California, a flock of Golden-crowned and White crowned sparrows, Chestnut-backed Chickadees, and Ruby-crowned Kinglets were responding to "psh-psh-psh" when a Cooper's Hawk flew in and perched, looked at me, and moved its head from side to side, clearly brought in by my vocalizations. A few days later (January 12, 1985) at 11:10 A.M. near my home in Foxboro, Massachusetts, two noisy chickadees and a Brown Creeper responded to pishing and then froze. When they stopped calling and moving, I looked around and saw a Sharp-shinned Hawk perched about thirty feet away, clearly interested in my calls, although perhaps initially curious about the fussing of the chickadees. The Brown Creeper remained motionless until I flushed it two or three minutes later, long after the Sharpie had disappeared into the forest.

There seems to be a wide range in the intensity of response. A low level of reaction was illustrated by several sandpiper species not long after the incident of the hungry Sharp-shinned Hawk at Wellfleet. A juvenile White-rumped and two Solitary Sandpipers, all within twenty-five feet, stopped their foraging activities when I pished and assumed an alert posture. After a few seconds they resumed feeding and did not respond to subsequent calls. Blue Jays, House Sparrows, chickadees, and Tufted Titmice, as typical examples, often pop up out of dense scrub and perch in full view, move their heads from side to side, vocalize, become agitated, and look at the source of the pishing sounds. The strongest reaction, as illustrated by hawks and many passerines, consists of flying in the direction of the caller before perching, sometimes emitting vocalizations, and demonstrating agitation that is similar to but often more intense than the intermediate levels of response. Why do birds react in this way to "psh-psh-psh?"

A number of suggestions have been made to account for this. Neal G. Smith (1975) defended the idea that this sound (he calls it "spshing") is effective because it mimics the vocalizations of certain birds that play a central bonding role in flocks of mixed species in Central and South America. Our migrant species wintering in the Neotropics are attracted to these foraging flocks, and thus the effectiveness of the calls is related to an adaptation of our migrant birds to unfamiliar environments. This argument is supported by the lack of response of European migrant birds to pishing, because they do not join mixed flocks on their wintering grounds in Africa. Also, Smith was not aware of any nonpasserine bird that is attracted by this call.

A later summary by James Tucker (1978) of published observations and thoughts of several authors on the subject of pishing and squeaking includes substantial rebuttal to Smith's ideas. The information in the article suggests that the origin of pishing goes back at least to the early 1930s. Charles Allen's list of responding species includes the Sharp-shinned Hawk and Hairy and Downy woodpeckers, which are all nonpasserine species that reacted to pishing (he calls it swishing). Steve West added exotic nonpasserines such as the Long-tailed Hermit and Slaty-tailed Trogon to the list of responders. In the Tucker article, Charles Allen in an analysis of Neal Smith's paper, points out that the response to pishing is more intense than one would expect from a bird merely attracted to a mixed foraging flock. In addition, Allen states that among the forty-seven species drawn in by his pishing were numerous species that never came close to visiting the tropics.

The idea that European birds are not attracted to "psh-psh-psh" was strongly questioned by P. William Smith (1986) in a letter in which he detailed his success at calling British birds into view with this method. In addition, he presented an interesting hypothesis to account for the attractive qualities of

pishing (which is the word he uses). Smith suggested that the great variety of bird species responding to this sound in widely separated regions of Great Britain did so because this vocalization mimics what Marler (1955, 1959) describes as the sounds emitted by birds involved in mobbing predators, and may be what Thielcke (1976) describes as "ground alarm calls." These calls, described by Marler (1955), are uttered when a bird of prey is perched, and the mobbing birds are conspicuous. The vocalizations are harsh and repetitive, and they contain a wide range of frequencies, all of which make the source of the sound easy to find (in contrast to the high-pitched, narrow-frequency alarm notes of many birds, which are very difficult to locate). Presumably, their function is to attract other birds to the mobbing scene and perhaps warn of a predator's presence. These "chink" notes, as Marler describes them for the Chaffinch, may well serve all the functions suggested, but I do not think that mimicry of these calls is responsible for a major part of the response elicited from birds by pishing. Rather, I think that the birds are reacting because the sound mimics distress calls in birds, calls that may be related to but are different from those produced by mobbing birds.

This idea is not entirely new. Kress (1981) refers to it as follows: "To attract land birds try imitating the generalized distress call, known as pishing, that many birds give when they are alarmed," although he later suggests that "songbirds are attracted to pishing and squeaking noises because these sounds are similar to the alarm notes that communicate the presence of a predator." Many birders have the intuitive thought that "psh-psh" represents some sort of distress situation to birds. But there is some confusion in the literature as to what constitutes distress calls. They are not the same as the "mobbing" calls of Marler or the variety of "alarm" notes uttered by birds on the ground or in the air. Distress calls, or screams, are vocalizations uttered by birds in extreme distress, as when attacked by predators or handled by bird banders as they remove them from mist nets or traps. These sounds, like the notes uttered by birds mobbing a predator, are harsh, repetitive, and span a wide range of frequencies (pitch), usually from very low notes to very high. They are given by a wide range of bird species of many orders and are similar in basic structure. Their apparent function (if any) is to call attention to the bird attacked, possibly eliciting a mobbing response by other birds, including other predators, that might distract the attacker and allow the bird to escape. That birds respond to playback recordings of distress calls of their own and other species has been well documented for White-throated, Swamp, and Song sparrows (Stefanski and Falls 1972). Leahy (1982) reports that crows also may be attracted by imitations of their distress calls.

That predators respond to distress calls has also been reported. Michael Perrone (1980) found that in tape playback experiments using distress calls of a

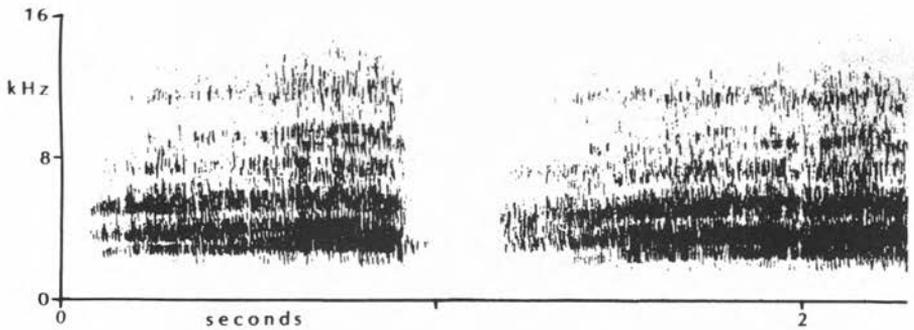


Figure 1. This sonagram shows a distress call emitted by a starling during its removal from a trap. The horizontal axis measures time in seconds, and the vertical axis is in kilohertz (or thousands of cycles per second). The latter is a measure of the frequency (pitch) of the sound. The darkness of the tracing is a measure of the amplitude (magnitude) of the sound. This distress call illustrates the wide range of frequencies typically produced in such calls and their repetitive nature. Harsh, repetitive sounds are easy to locate, and signal, "Here I am."

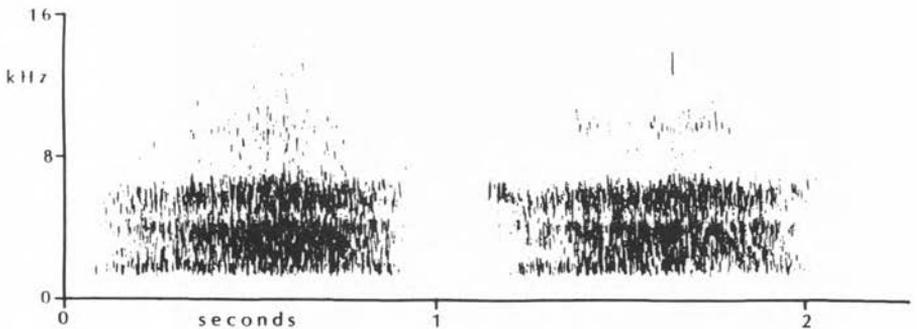


Figure 2. This sonagram shows the author's "psh-psh" call. Notice how similar in structure the sounds are to the starling distress calls. They are harsh, encompassing a wide range of frequencies, and are repetitive, making them easy to locate.

Varied Thrush and a Brown Towhee, seven trials attracted a Cooper's Hawk on one occasion, two Sharp-shinned Hawks at one time, and a Great Horned Owl on two occasions. Cade (1962) reports that a Northern Shrike attacked and grabbed a House Sparrow, which uttered "a series of squeals" (distress calls, I presume) that drew an immediate mobbing response from three other House Sparrows and two Downy Woodpeckers. The sparrow escaped from the distracted shrike! Stefanski and Falls (1972) reported that on separate occasions a Song Sparrow and a Blue Jay uttered distress calls when captured by Sharp-shinned Hawks. In the latter instance, other Blue Jays mobbed the hawk, and the captured Blue Jay escaped!

The structural similarities between distress calls (Figure 1) and my pishing calls (Figure 2), together with the similarity between the responses of a variety of only distantly related bird species to both distress calls and pishing (e.g., House Sparrows, Blue Jays, and Sharp-shinned Hawks), suggests to me that the birds attracted to pishing may be reacting to a mimic of distress calls.

As usual, many questions remain unanswered. Are the squeaking noises that birders make to attract birds mimicking distress calls as well? Rohwer and colleagues (1976) and Thielcke (1976) suggest that they do, even though the squeaking often lacks the repetitive nature of either distress calls or pishing. Why do some bird species tend to respond more regularly to pishing than others? Why do some species utter distress calls commonly, whereas others do so infrequently or not at all? Is the frequency of response seasonal? Is there some threshold of stimulus that must be passed before a bird will respond to "psh-psh-psh?" Do other activities, such as foraging for food, tend to lower the response rate? Does territoriality affect the level of response? To account for the effects of all possible variables would require collecting under controlled conditions an enormous amount of data. At this time, we have more questions than answers.

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