

Feather Fascination!

with local Birdwatcher, Jim Butler

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SINGING FAIRY-WRENS

When we sing we take a big breath and make beautiful sounds by expelling air through our voice boxes. When all the air is expelled we must stop singing and draw in another breath. This characteristic pattern, with alternating song and silence, is necessitated by our need to replenish our lungs which keeps us alive and allows us to sing again. Interestingly, the fairy-wrens manage the singing and breathing interaction differently to us.

When birds are not singing they breathe at a rate given by a simple formula $BR = 17(M)^{-0.34}$! For an 8-9 gram bird (M), like the three local fairy-wrens, the breathing rate (BR) at rest is about 1.5 breaths per second. The songs of the fairy-wrens last about 3 – 4 seconds. So if they sang like us, their songs would consist of alternating song and silence, with 5 silent periods while they inhaled during the 4 second song. However, this is not the song/silence pattern of their songs. In fact, in those 4 seconds they utter about 60 notes and have 59 silent periods. And like us, they are using

the silent periods to breathe, to stay alive. Our ears cannot detect each of the sixty notes and the silences between them.

The 60 breaths they take while singing one song, at 15 breaths per second (ten times the rate when they are not singing) are called mini-breaths. This is the characteristic breathing pattern during singing of most of the world's singing birds. These mini-breaths have been measured and it turns out that the birds inhale the amount of air that they exhaled to produce the previous note in their song. The fastest mini-breathing has been measured in canaries, who can take mini-breaths at the rate of 33 breaths per second while they sing their magnificent rapid trills.

Happy listening to singing birds!

~ Jim

Image: Superb Fairy-wren by Mike Ford ©

